
Anales de Economía Aplicada

Universida_{de}Vigo



Asepelt

Asociación Internacional de Economía Aplicada

Asepelt2019
economía azul





XXXIII
CONGRESO INTERNACIONAL
DE **ECONOMÍA APLICADA**
Asepelt
2019
economía azul

COMITÉ ORGANIZADOR:

Anna Bykova, Raquel Fernández González, Carlos M. Fernández-Jardón, Juan J. García del Hoyo, Miguel González Loureiro, Xavier Martínez Cobas, Petr Parshakov, Marcos Pérez Pérez, José Rodríguez Avi, Jesyca María Salgado Barandela, Manuel Varela Lafuente, Bozidar Vlacic.

COMITÉ CIENTÍFICO:

PRESIDENTE: Carlos M. Fernández-Jardón.

Joaquín Aranda Gallego, Philips Arestis, Luiz Autran Gómez, Ángel Barajas Alonso, Estela Bee Dagum, Francisco Carballo, Dennis Coates, Guillermo Corres, Josefa Fernández Arrufe, Jesús Ferreiro Aparicio, Juan J. García del Hoyo, Antonio García Lizana, José García Pérez, María Dolores Garza Gil, Klaus Gierhake, Clandia M. Gomes, Joao Guimaraes, Ginés Guirao Pérez, Rafael Herrerías Pleguezuelo, Xavier Martínez Cobas, Mariia Molodchik, José María Montero Lorenzo, José María Moreno Jiménez, Santiago Murgui Izquierdo, Pablo Podadera Rivera, Antonio Pulido San Román, José Ramos Pires-Manso, Martín Sevilla Jiménez, Elena Shakina, Nilda Tañski, María Teresa Torregrosa Martí, Manuel Varela Lafuente, Luis G. Vargas.

EDITORES:

Anna Bykova, Raquel Fernández González, Carlos M. Fernández-Jardón, Juan J. García del Hoyo, Miguel González Loureiro, Xavier Martínez Cobas, Petr Parshakov, Marcos Pérez Pérez, José Rodríguez Avi, Jesyca María Salgado Barandela, Manuel Varela Lafuente, Bozidar Vlacic.

Abstracts XXIII Congreso Internacional de Economía Aplicada, Asepelt 2019

ISBN: 978-84-120734-2-3

Editorial: Linckia Integria

Universidad de Vigo

Asociación Internacional de Economía Aplicada



Organiza

Universidade de Vigo



Asociación Internacional de Economía Aplicada

Colabora



Economics and Business Administration for Society

CONCELLO
DE VIGO



Autoridad Portuaria de Vigo



XXXIII
CONGRESO INTERNACIONAL
DE **ECONOMÍA APLICADA**
Asepelt
2019
economía azul

ÍNDICE

SESIÓN KLEIN

El diseño e implementación de la estrategia de crecimiento azul en el Puerto de Vigo como herramienta de desarrollo sostenible 10

PREMIO BERNARDO PENA JÓVENES INVESTIGADORES

PRIMER PREMIO

Is there a day-of-the-week effect in overnight and daytime periods in the US equity market? A risk-adjusted returns comparison approach 21

PRIMER ACCESIT

Measuring the effect of human capital as a source of value in the Wood sector of Galiza and Portugal 36

SEGUNDO ACCESIT

Economía del bien común: fundamentos y futuras líneas de investigación 51

ARTÍCULOS

The role of the trust in corporate cash holding policy: evidence from european countries 71

Trace policy in retrospect: the great recession and the determinants of tariff and antidumping restrictions in Argentina, Brazil and Mexico 107

Eficiência portuária no brasil: obstrução ou apoio ao desenvolvimento?	120
El Prestige: comparativa de los regímenes internacionales de responsabilidad civil	142
Measuring the intelectual capital in russian enterprises	153
The role of the Iomé, Yaoundé and Cotonou agreements in the process of trade liberalization in the European Union	177
Stewart index and collinearity: the case of raise refression	190
Floricultura en el sur del estado de México: precariedad salarial generadora de costos sociales	205
Analysis of the effects of the modular design model of car production on working conditions: the cases of VW Navarra and PSA Vigo	220
Social effects of energy subsidies and taxes on CO ₂ emissions in mexican aquaculture production: the case of shrimp larvae production	230
Oportunismo en los negocios: caso La Maná	238
Destilado de agave en el sur del estado de México: condiciones de producción y comercialización que inciden en el consumo	249
The influence of sociability over non-mortgage debt	262
The effect of self-control upon participation in voluntary pension schemes	279
Raise regression: types of raising and mean square error	294
Análisis coste/efectividad del tratamiento fármaco-terapéutico del cáncer de pulmón en un hospital universitario de España	301
Análisis bioeconómico depredador-presa: la pesquería mixta comunitaria de merluza y bacaladilla	316
Teorías de la conducta del pescador: un análisis de la pesca artesanal en Galicia	334
How much does drug and alcohol hospital treatment cost in Europe? What causes spending?	346
Incorporación del factor memoria en el modelo de cuatro factores de Fama y French	376
Una revisión de la literatura sobre política fiscal desde la perspectiva de la Teoría Monetaria Moderna	384
Definición de un sistema de indicadores para la medición de la calidad del empleo turístico como fuente de ventaja competitiva empresarial y redistribución territorial de la riqueza	415

COMUNICACIONES

Fomento del desarrollo comunitario sustentable en pueblos originarios del estado de México para su seguridad alimentaria	448
Gobernanza y crisis financiera: el caso de las cajas de ahorro españolas	465
Empleo, participación social y calidad de vida de las mujeres en España y Europa: evolución en 2008-2018	483

Un nuevo enfoque para una estrategia de arbitraje estadístico. El Método HP	496
Interacciones de gobernanza en las pesquerías a pequeña escala de Galicia (noroeste de España): percepciones y dinámicas en las cofradías de pescadores	506
La mancomunidad de las Comunidades de Montes Vecinales en Mano Común: fusión de comunidades para afrontar los retos del monte en Galicia	519
Brecha de género en las “carreras azules”: el caso de ingeniería naval y oceanática en España	529
¿Existen diferencias en el comportamiento asociacionista de los ciudadanos aragoneses en función de la localidad en la que residen?	538
Valoración de proyectos de inversión a través de opciones reales. Aplicación al capital riesgo en el sector tecnológico	561
Análisis del comportamiento y competitividad de la producción y comercio del arroz palay en México	575
Análisis del comportamiento y competitividad de la producción y comercio del chile verde en México	593
Profundizando en el fenómeno del textil técnico: innovación y estrategias de <i>networking</i> en clústeres maduros	611
Efectos económicos del Brexit sobre el mercado común de la pesca: análisis de las percepciones de empresas españolas	639
Do banks discriminate small companies in the negotiation of loans? A principal component analysis	661
Mapping the field of international competitiveness research	681
Nuevas distribuciones discretas para la modelización de datos sobredispersos: aplicación a variables municipales	691

RESÚMENES

Sobrecualificación laboral del titulado universitario español	707
Migración en Chile. El caso del Perú. 2005-2014	709
Modelo predictivo del gasto hospitalario en pacientes con diabetes mellitus tipo II en un hospital de referencia en Colombia	710
Child care and gender role attitudes in Spain from a spatial perspective	712
Rentabilidad de la sanidad privada española desde una perspectiva de género y el desarrollo de prácticas de responsabilidad social corporativa. Un estudio por comunidades autónomas	714
La presencia de mujeres en el consejo de administración y su impacto en el desempeño financiero. Evidencia en las compañías del IBEX-35	716
Relación entre la diversidad de género en el consejo de administración de las empresas y la responsabilidad social corporativa	718
Los determinantes del gasto turístico de los hogares mexicanos: aplicación de un modelo de regresión logístico	720

An approach to customer trust in the portuguese banking system	721
The roles of agency costs and low country level shareholder protection on family firms' cash holding decision	722
Consistencia y compatibilidad en decisión de grupo con el Proceso Analítico Jerárquico (AHP). Algunas ideas de mejora	724
Un sistema de inventario con demanda dependiente del tiempo, pérdida de ventas y período discreto de planificación	726
Is the contribution of the dimension of the financial sector to economic growth in European Union always positive? A panel data analysis of the EU-28 countries	728
El sistema de financiación de las entidades del tercer sector mediante la 'X solidaria'	730
La medición de la eficiencia medioambiental en presencia de outputs no deseables: una aplicación para destinos turísticos en España	732
¿Afecta la calidad institucional del Gobierno al nivel de delito de los países?	733
Ahorro previsional en el mercado español: un estudio longitudinal	735
Como crescem as empresas? Modos, caminhos e estratégias	737
Valoración y selección de activos en el mercado de la energía: una aproximación dinámica multivariante	738
Análisis de las interrelaciones entre la evolución de la flota atunera española y el sector conservero	740
Identificación Bayesiana de subgrupos homogéneos de decisores en AHP: búsqueda estocástica en un contexto local	741
A relação entre a dimensão do sistema financeiro e o crescimento económico: evidência para os países da região da África subsariana	743
Rivalidad y ciclo de vida en el sector automovilístico	745
La política de la UE ante la pobreza y la exclusión social. Una revisión crítica	747
Eficiencia técnica de pesquerías con heterogeneidad inobservada	749
Las comunidades de pescadores: definición, identificación y clasificación	751
The economic cost of the Arab Spring: the case of the Egyptian Revolution	753
La sostenibilidad fiscal en América Latina	754
An efficient portfolio approach towards ecosystem based fisheries governance in EU	755
Sistema portuario y desarrollo sostenible: análisis de la ecoeficiencia en los puertos españoles de interés general	756
Probabilidad individual de desempleo durante la Gran Recesión en España	758
Estimación de ratings de deuda soberana en la UE15 de 2002 a 2017 mediante clasificadores ordinales	760
Mercado de trabajo y relaciones laborales en Alemania: anatomía de un proceso de dualización	762
Efectos macroeconómicos de la reducción del tiempo de trabajo en la economía española	764

Modelos de dualidad del mercado de trabajo y crecimiento de los salarios en economías avanzadas	766
Una medida de localización robusta a partir del índice de Gini	768
Is 'Baumol's growth disease' increasingly undermining the US economy?	769
Descomposición simultánea de la desigualdad por subgrupos y fuentes de renta. Redistribución por regiones en Ecuador	770
PYMEs en la economía global: análisis del proceso de internacionalización	772
Previsão de falência empresarial: a eficiência dos modelos nas empresas ibéricas da velha economia azul	774
Avaliação de performance e estratégia empresarial: desafios e oportunidades de criação de valor	776
Factores determinantes de ineficiencia de las MYPEs en el sector de restaurantes y alojamiento en el Perú: un análisis de frontera estocástica	778
Análisis de la severidad de la violencia contra la mujer: un modelo Logit ordinal generalizado	779
La IDE: ¿algún impacto sobre la salud socioeconómica de los países receptores? Estudio de caso	781
Disposición a innovar y competitividad: un análisis para las empresas extremeñas	783
Análisis de la tendencia a la liquidez del agregado monetario M3 en la eurozona: 1997-2018	785
Las TIC en la agricultura: ¿reduciendo o incrementando desigualdades?	786
La gobernanza azul: una gobernanza portuaria sostenible	788
Claves de la rentabilidad en el sector porcino español	790
Perceptions on the "limits to privatization" in fisheries	791
The economics of happiness: an approach to portuguese economy	793
El impacto del neuroliderazgo en los resultados organizacionales	794

PÓSTERS

El emprendimiento universitario: una aproximación al caso gallego	796
Risk of overexploitation of red tuna: implications for value chain management	797
Consumer needs and perceptions of traceability in the fish sector	798
Evaluación de la eficiencia de las unidades funcionales de atención primaria del departamento de salud Valencia Clínico-La Malvarrosa de la Comunidad Valenciana	800
Centros de educación no universitaria. Un estudio de modelo	802
Configuración del empleo turístico y medición de la eficiencia en las empresas hoteleras de las Islas Canarias	804

Sesión Klein

XXXIII

CONGRESO INTERNACIONAL
DE ECONOMÍA APLICADA

Asepelt

2019

economía azul

Universida_{de}Vigo

 **Asepelt**

Asociación Internacional de Economía Aplicada



EL DISEÑO E IMPLEMENTACIÓN DE LA ESTRATEGIA DE CRECIMIENTO AZUL EN EL PUERTO DE VIGO COMO HERRAMIENTA DE DESARROLLO SOSTENIBLE

CARLOS BOTANA LAGARÓN

Departamento de Sostenibilidad/Autoridad Portuaria de Vigo
Praza da Estrela, 1. 36201, Vigo

e-mail: carlosbotana@apvigo.es

1. INTRODUCCIÓN

El concepto de Economía Azul se ha convertido desde 2014 en un término manejado por diferentes actores económico y sociales del entorno de las áreas marinas costeras. Surge como respuesta a la crisis de desarrollo sostenible de las áreas marinas costeras. El Océano, fuente de oportunidades, es en muchas áreas costeras observado sin ser integrado de forma explícita en las estrategias de desarrollo territorial.

En 2015, la Autoridad Portuaria de Vigo recibe el encargo de la Xunta de Galicia, a través de la Consellería do Mar, de analizar las posibilidades de implementación de este concepto en el ámbito de gestión territorial de su competencia. Este ejercicio respondía al entendimiento de que un territorio debe ser gestionado desde una perspectiva holística en la que se tenga en cuenta todas las actividades económicas y sociales que se desarrollan en su entorno, pero que además su interacción suma posibilidades de desarrollo. Este será además sostenible si se integra en su gestión a todos los grupos de interés públicos y privados y además se integra en la planificación estratégica de las entidades competentes.

Todo ello además se enmarca en el compromiso de la Autoridad Portuaria de Vigo con los Objetivos de Desarrollo Sostenible, que nos recuerdan la relevancia de integrar enfoques de desarrollo social, económico y medioambiental, apoyándonos en herramientas colaborativas y participativas. De este modo se lograrán procesos de desarrollo sostenible en el que el impacto inmediato se mida en términos de mejora de calidad de vida de las personas.

En este documento se explica el desarrollo metodológico del Plan Puerto de Vigo, haciendo incidencia en aquellos aspectos clave para su desarrollo, pero cumpliendo con los cuatro objetivos definidos en la estrategia de crecimiento Azul:

- Ser un Puerto Verde, generando el mínimo impacto en el medio y con el uso de las mejores tecnologías
- Ser un puerto Innovador, introduciendo la innovación en todos los procesos y sectores, desde los más desarrollados pero también a los tradicionales

- Ser un Puerto conectado con infraestructuras pero también con las tecnologías TIC
- Ser un Puerto Inclusivo, que piense en y para las personas, creando empleo de calidad y mejorando las condiciones de los trabajadores del sector marítimo.

Este último objetivo es el que le da un carácter más innovador frente a conceptos más medio ambientales o económicos.

2. METODOLOGÍA

El primer reto para un Puerto tiene que ser identificar los sectores económicos marítimos que hay en su zona de influencia, en el caso de Vigo se identificaron 14 sectores, algunos de ellos transversales (formación, historia, level playing field) y otros más directos con la economía azul (pesca fresca, pesca congelada, construcción naval, energía azul, biotecnología, autopistas del mar, mercancía general, simplificación de tramites administrativos, trafico de cruceros, náutica deportiva, Puerto seco – logística)

En el proceso de diseño y de implementación de la estrategia se tienen en cuenta cuatro aspectos fundamentales que deben imperar en todo el proceso.

- INTEGRACION de sectores económicos que dependen directa e indirectamente del mar: se crearon 14 grupos de trabajo (14 sectores de la economía Azul)
- INTERRELACION de los sectores se realiza en base a competencias comunes e infraestructuras compartidas (Puerto de Vigo)
- y dependen de que los otros sectores utilicen el mar de forma SOSTENIBLE.
- La consideración de la economía azul es trabajar por la generación de VALOR. Es una iniciativa viva, continua e inclusiva: en los grupos de trabajo han participado más de 250 personas.

También era necesario crear una base teórica sólida, para lo cual nos basamos en dos conceptos claros:

A) EL CONCEPTO DEL DESARROLLO

Aunque hablemos de un crecimiento azul y de desarrollar la Economía Azul, tenemos que tener presente que estamos hablando de algo que va más allá del fenómeno económico y los aspectos tecnológicos. El ejercicio de elaborar una estrategia del Crecimiento Azul necesita tener en consideración cuestiones sociales y debe de contribuir también a resolver los aspectos básicos que acompañan a cualquier proceso de desarrollo: el bienestar general de los ciudadanos, la disminución de las desigualdades sociales, y sobre todo, el desempleo que es una de las grandes lacras del momento económico actual en la Unión Europea. Entendemos que factores sociales, de formación y culturales han de estar recogido en cualquier propuesta de aplicación del principio Blue Growth, y es por eso que se ha incluido en nuestro planteamiento la formación y el patrimonio cultural.

Siendo conscientes de la importancia del desarrollo sostenible, damos en el documento un repaso a las ideas sobre el mundo de la economía del desarrollo que

ha ofrecido conceptos interesantes a tener en cuenta, resaltando primeramente las tesis sobre las fases del crecimiento económico según el profesor de Historia Económica del Massachusetts Institute of Economy, Walt Withman ROSTOW, cuya publicación "The stages of economic growth" contiene reflexiones muy interesantes basadas en un análisis histórico del desarrollo económico de los diferentes países del mundo. El autor distingue cinco fases del crecimiento que nos hemos permitido reformular para adaptarlas al momento actual y para enmarcar mejor el papel que juega el conocimiento en el momento actual en el proceso global de producción. Estas fases del desarrollo tienen una lógica propia: el término desarrollo no es un término absoluto sino que las naciones se encuentran en permanente desarrollo y los ciclos económicos se van continuando sucediendo, es decir un desarrollo económico sostenible se basa en un cambio de sus instituciones y una nueva mentalidad debe de establecerse en el conjunto de la sociedad **para innovar e imaginar**. El Crecimiento Azul se basa pues en principalmente en el concurso y estímulo de la **iniciativa privada**, aunque las instituciones y financiación pública puedan concurrir en su papel de "catalizadores" de este crecimiento.

B) LA TEORÍA DE MICROECONOMÍA DE PORTER

La internacionalización del mundo empresarial es un hecho desde hace ya mucho tiempo, hasta las pequeñas y medianas empresas que se habían quedado al resguardo de la competencia internacional se ven ahora afectadas por la misma.

Un fundamento teórico útil del mundo de la microeconomía para nuestro caso es, a nuestro juicio, el análisis de los agregados empresariales como base para la competitividad, una teoría microeconómica elaborada por Michael Porter que nos proporcionan ideas relevantes para elaborar un concepto de crecimiento azul. En este documento presentamos una breve revisión de sus argumentos, pero nos parece necesario dar aquí ya un resumen de sus conceptos porque nos hace falta algún paradigma que enfoque más las cuestiones económicas de una manera más cercana a las industrias, conglomerados industriales y las relaciones entre las empresas.

Porter¹ da especial importancia al desarrollo armónico de los agregados empresariales y explica las razones de la ventaja competitiva que los conglomerados industriales exitosos, los que denomina clústers², proporcionan al desarrollo y la propia fortaleza económica de los países que albergan estas industrias: este autor mantiene que la prosperidad nacional no resulta de manera directa de los recursos naturales de los países, ni de su fuerza laboral, ni de las tasas de interés, sino que la competitividad nacional va a depender de la capacidad de su industria para innovar y actualizar o mejorar sus productos y sus procesos productivos.

Porter afirma que este potencial para competir se encuentra en primer lugar en el seno de la propia empresa y en la capacidad de innovar y de optimizar su propia cadena de valor, pero resalta que las empresas no subsisten aisladas del entorno sino que necesitan relacionarse con entidades de todo tipo, normalmente empresas

¹ PORTER, M.- 1990 . The competitive advantage of nations. *The Mac Millan Press Ltd.* 855 pgs.

² Porter define "**Clusters**" como concentraciones geográficas de empresas interconectadas, suministradores especializados, proveedores de servicios, otras firmas en industrias relacionadas e instituciones asociadas en áreas particulares que compiten pero que también cooperan.

de apoyo, suministro, clientes, empresas de servicios etc., cada una de ellas con su propia cadena de valor. Todas estas empresas conforman según él un denominado “sistema de valor” generando sinergias entre los integrantes. Una de las principales conclusiones de Porter hemos tenido muy en cuenta a la hora de intentar aplicar el concepto del Crecimiento Azul en el caso del Hinterland del Puerto de Vigo, que la eficacia y por tanto la competitividad del conjunto es mayor que la suma de las partes aisladas. Como consecuencia, Porter deduce que cuanto más competitivo sea el conjunto, mayor será la competitividad del conjunto empresarial y del sector industrial, y más sólido será el desarrollo económico.

Las ideas de Porter han influido significativamente en la elaboración del Plan Blue Growth Vigo porque estamos convencidos de que el ejercicio de aplicación del concepto de Crecimiento Azul tiene que ser un ejercicio holístico, es decir que tiene que incluir en su análisis, aunque sea somero, todos los factores, endógenos y exógenos, que afectan a las actividades azules. Además, de aquí se extrae la conclusión para la aplicación del concepto de que para relanzar la economía marítima de una zona en particular, las acciones que se determinen como prioritarias han de ser relanzadas todas ellas al mismo tiempo, con objetivos concretos, buscando sinergias y tratando que el conjunto de los sectores económicos avancen todos en paralelo para estimular y guardar las ventajas competitivas del conjunto. Es decir, el ejercicio Blue Growth es holístico tanto en el ámbito espacial como en el temporal. Solo relanzando el conjunto, naturalmente en la medida de lo posible, se asegura la competitividad general del sistema así como el de intensificación de las sinergias entre todos los componentes de la Economía Azul.

A modo ejemplo se puede poner como se realizó el análisis de la pesca Congelada. Si hiciéramos desde el Puerto un análisis no blue growth, visto en cambio desde fuera alguien podría concluir que este desarrollo se debe a que en el Puerto de Vigo existen unas instalaciones de carga y descarga que son las responsables de atraer todo este tráfico, lo cual es cierto, y por ello podría alguien estar tentado a concluir que para aumentar estas descargas tendríamos que centrarnos en analizar la competitividad de las instalaciones portuarias viguesas. Por ello y con este prisma, si hiciéramos un análisis de competitividad clásico sin seguir la pauta marcada por la idea de “Crecimiento Azul” de la Comisión, concluiríamos, por simplificar, que los temas a analizar para atraer más carga serían, entre otros:

- Incremento de la competitividad en las terminales.
- Condiciones de competitividad en la estiba y desestiba.
- Alivio de los trámites burocráticos.
- Estudio de las condiciones de la Competencia en puertos europeos.

Pero, sin embargo, bajo la idea de análisis tipo “**Blue Growth**”, esto no sería suficiente, sino que para que esa economía funcione correctamente y genere empleo, es necesario analizar, además, la competitividad de otros factores externos que inciden sobre esta actividad de descarga y que denominamos aquí como **Factores Generales de Competitividad** y que son los realmente responsables de que en el Hinterland del Puerto de Vigo haya surgido una potente industria de transformación de productos de la pesca, de sus servicios y de su comercialización, así como haberse convertido en el centro de la inversión internacional en materia de la pesca.

Contemplado desde esta perspectiva holística, ***Procede preguntarse de nuevo por qué Vigo y no otro es el puerto principal de descarga de pescado congelado en la Unión Europea.*** Un rápido análisis nos mostraría inmediatamente que esta descarga procede de empresas pesqueras viguesas que realizan actividad extractiva en aguas lejanas, tanto internacionales como bajo jurisdicción de terceros países, y que, a su amparo e íntimamente ligada a la actividad extractiva, se ha desarrollado en Vigo y su entorno una importantísima industria de procesamiento que utiliza esos productos como materia prima y abastecimiento del mercado, principalmente interno, es decir el mercado español en primer lugar y del resto de la Unión Europea en menor medida. Se cumplen en este sector las condiciones que refuerzan la competitividad en el análisis de Porter, en el sentido de que existe un mercado interno fuerte, sofisticado y con una intensa competición entre las empresas que concurren a este mercado, que en buena medida han estimulado este desarrollo.

Visto desde esta perspectiva, la competitividad del puerto de Vigo en la actividad de carga y descarga de la pesca congelada no dependerá solo de las actividades de estiba y desestiba en sí mismas ni de las operaciones técnicas ligadas a la mera carga y descarga, sino que, además, y de manera muy especial, dependerá de que las empresas sigan suministrando al mercado productos en condiciones de competitividad, y esto es una característica muy especial del puerto de Vigo, pero también, por ejemplo, afecta a los puertos de Marín y Villagarcía. Según entendemos, bajo el criterio de análisis "Crecimiento Azul" deberíamos de analizar también los factores de competitividad de todas las flotas suministradoras y que, al menos, deberían de incluir, al menos, los siguientes puntos:

1) Flota española en caladeros internacionales:

- Level Playing Field en las ORP.
- Legislación internacional no hostil.
- Seguridad jurídica en los caladeros.
- Defensa jurídica de los derechos históricos (Ej. Svalbard).

2) Empresas conjuntas en terceros países:

- Seguridad jurídica de las inversiones.
- Sinergia con las políticas de Cooperación Técnica y de desarrollo.
- Líneas específicas de financiación.
- Reconocimiento explícito de estas empresas en la PPC.

3) Para las dos flotas anteriores.

- Mantenimiento de un empleo atractivo en el sector.
- Modernización de la flota.

4) Flotas y empresas de terceros países

- Seguridad jurídica de las inversiones europeas en estos países.
- Level Playing Field en las explotaciones y acceso al mercado comunitario de los productos de estas empresas.

- Respeto a las normas relativas a la lucha contra la IUU y un respeto hacia el cumplimiento de ciertos mínimos relativos a los derechos sociales y humanos de estas explotaciones
- Cooperación en el marco de las ORP

Y tendríamos que continuar con el sector de la transformación y distribución como se puede ver en el gráfico, y sectores transversales como el de construcción naval necesarios para la renovación de la flota pesquera, que tiene más de 30 años.

Como ejemplo de esta complejidad concluiremos que, si se hubiera realizado un análisis de la potenciación del puerto de Vigo como punto focal de las descargas de pescado congelado sin tener en cuenta los factores ajenos a la mera carga y descarga de la mercancía, habríamos analizado solamente cinco puntos de análisis, mientras que **con el análisis “Blue Growth”, nos vemos obligados a analizar al menos 22** y esto sin tener en cuenta aún las interrelaciones entre los grupos de estudio propuestos y que hemos enumerado antes.

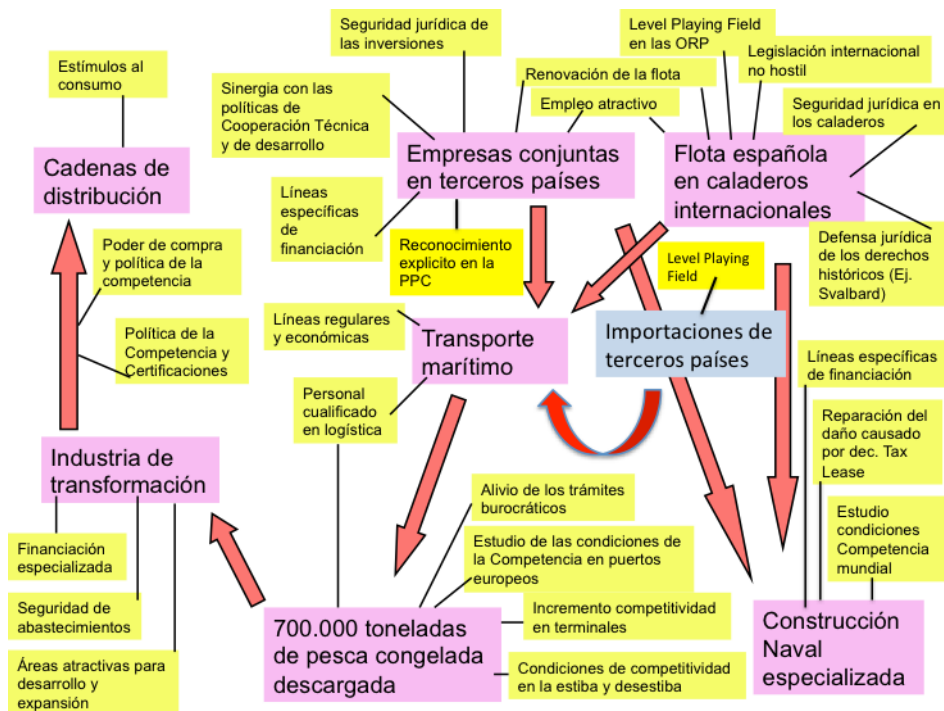


Figura 1: Proceso de implementación

2.1. EL PROCESO DE DISEÑO

El proceso de diseño del Plan se plantea desde la generación de un diálogo entre los diferentes grupos de interés que llevaría a identificar los principales retos de competitividad a los que se enfrenta el espacio económico portuario. A continuación se hace referencia a los aspectos clave:

- **Involucración de más de 300 personas asociadas** a entidades con actividades directamente relacionadas con las competencias del ámbito portuario. Estas entidades son tanto públicas y privadas y se pretende continúen en todo el proceso de implementación del Plan. Su participación es clave al contar con la información y experiencia necesaria para favorecer procesos de sinergia y generación de valor entre las diferentes actividades.
- **Alineación con las políticas de innovación y competitividad** tanto en el ámbito marino costero y portuario como de I+D+i y sectorial. Se toma como referencia las políticas locales, autonómicas, nacionales y comunitarias. Es necesario trabajar en procesos alineados con los contextos político - económicos actuales de modo que se aproveche además complementariedades y recursos.
- **Obtención de productos concretos cuya implementación repercutiría de forma directa en los objetivos de desarrollo esperados por la comunidad.** Estos productos son proyectos y acciones, definiendo a los primeros como aquellos que precisan de recursos financieros para su desarrollo, y acciones aquellas que dependen sobre todo de la voluntad de trabajo en equipo.

Incorporación del enfoque de Economía Azul en las estructuras y herramientas de planificación y gestión del Puerto de Vigo.

2.2. LA PUESTA EN MARCHA E IMPLEMENTACIÓN

La puesta en marcha e implementación del Plan Blue Growth se fundamenta en la existencia de una estructura de gestión solvente en cuanto a experiencia y disponibilidad de recursos técnicos y financieros, de este modo se asegura:

- La implementación de las acciones y proyectos previstos.
- La dinamización de los grupos de trabajo
- El seguimiento y evaluación de impacto del Plan en el desarrollo sostenible del área de influencia del Puerto de Vigo.
- La generación de alianzas públicas y privadas dirigidas a fortalecer el proceso de transferencia y sostenibilidad del Plan.

La implementación de las acciones y proyectos previstos.

En el Plan inicial se preveía el desarrollo de 38 proyectos y 45 acciones que dan respuesta a los retos y desafíos identificados en la fase de diseño, en el marco de las diferentes áreas temáticas. A fecha actual ***la cifra ha incrementado*** a 46 proyectos y 46 acciones.

La implementación, tanto de proyectos como de acciones, exige la vigilancia continua de ***oportunidades de financiación***, en concurrencia competitiva y no competitiva, pero también la continuidad del proceso de identificación de nuevos desafíos que exijan proyectos y acciones diferentes.

La identificación y propuesta de los proyectos y acciones ***procede tanto de la propia Autoridad Portuaria como de otras entidades que operan en el marco de la estrategia.*** La decisión sobre la ***selección de los proyectos y acciones responde a criterios relacionados con su alineación con la estrategia de***

Crecimiento Azul, entre los que se destaca su respuesta a los objetivos globales planteados y a que su implementación genere valor e impacto en el desarrollo sostenible.

A modo de ejemplo podemos escoger algunos proyectos que se encuentran directamente relacionados con los cuatro objetivos básicos, Verde, innovador, conectado e inclusivo, que nos servirán de ejemplo de las posibilidades tan grandes que tiene un ejercicio como este de implementación del crecimiento azul en una zona local o en un Puerto:

- Puerto Verde: En este objetivos tenemos diferentes proyectos y líneas de acción, desde proyectos vinculados en la lucha contra el cambio climático, como son el proyecto de las Islas Cíes Zero emisiones, con el uso de renovables o la Lonja autosuficiente con el uso de renovables; otros vinculados en la mejora de la biodiversidad y captación de CO2 como los jardines submarinos o la regeneración de las dársenas portuarias, y otros vinculados a la economía circular, como el reciclaje y limpieza de los Océanos.
- Puerto Innovador: en esta línea tenemos ejemplos muy interesantes con la hibridación de sectores, en el caso de la Lonja 4.0, donde el sector de la automoción uso su conocimiento logístico y tecnológico para el sector de la pesca, o el proyecto del Puerto del futuro, donde se usa la realidad aumentada tanto para formar como para mejorar los procesos logísticos del Puerto.
- Puerto Conectado: con la implementación de las autopistas del mar y las conexiones con otros modos de transporte o proyectos que mejoran la conectividad de los barcos pesqueros con tierra, para que los marineros se puedan conectar con sus casas.
- Puerto Inclusivo: Todos los proyectos de formación y de mejora de las condiciones de trabajo, entre ellos está la modernización del sector de marisqueo con el uso de nuevas tecnologías del naval, que les ayuden a hacer los trabajos más duros o los proyectos de historia y cultura.

2.3. LA MEDICIÓN DE IMPACTO

El fin último de todo proceso de planificación estratégica, es lograr a través de su implementación un cambio en el territorio sobre el que se ejerce. En este marco, el Plan Blue Growth del Puerto de Vigo pretende contribuir a generar un crecimiento sostenible de su área de influencia a través de la integración de sus vertientes social, económica y ambiental.

Con el fin de conocer el nivel de crecimiento al que se contribuye desde la implementación es preciso establecer mecanismos de evaluación de impacto. En el marco del Plan Blue Growth el impacto se mide desde dos vertientes:

- **Implementación.** A través de indicadores específicos se miden aspectos relacionados con la ejecución del plan de acción. Con ello es posible conocer el volumen de proyectos y acciones y su estado de ejecución, reuniones, alianzas generadas, presupuesto aplicado entre otros.

- **Impacto sobre el cumplimiento de los objetivos globales propuestos:** ser un Puerto Innovador, Inclusivo, Conectado y Verde. Para ello se establecen indicadores concretos relacionados con el ámbito del objetivo a medir: generación de procesos innovadores, puestos de trabajo creados, personas formados, ratios de emisiones de CO2, entre otros.

La dinámica de medición de impacto debe ser constante y para ello es preciso trabajar en el diseño de herramientas ad hoc. Éstas deberán permitir al equipo de trabajo y a todos los grupos de interés acceder a información online sobre el nivel de ejecución del Plan y el impacto que está ejerciendo en el crecimiento y desarrollo sostenible del territorio.

Desde la experiencia del Plan Blue Growth Vigo la medición de impacto no debe ser un fin, si no que debe plantearse como una herramienta de trabajo fundamental que incidirá en la gestión del mismo, pero que además permitirá un ejercicio de máxima transparencia con su entorno.

Siendo esta la única manera de demostrar que es una realidad, y no solo una estrategia política o de marketing, pasarla de ser un bonito eslogan de la Comisión Europea a una herramienta de crecimiento basada en datos reales y cuantitativos.

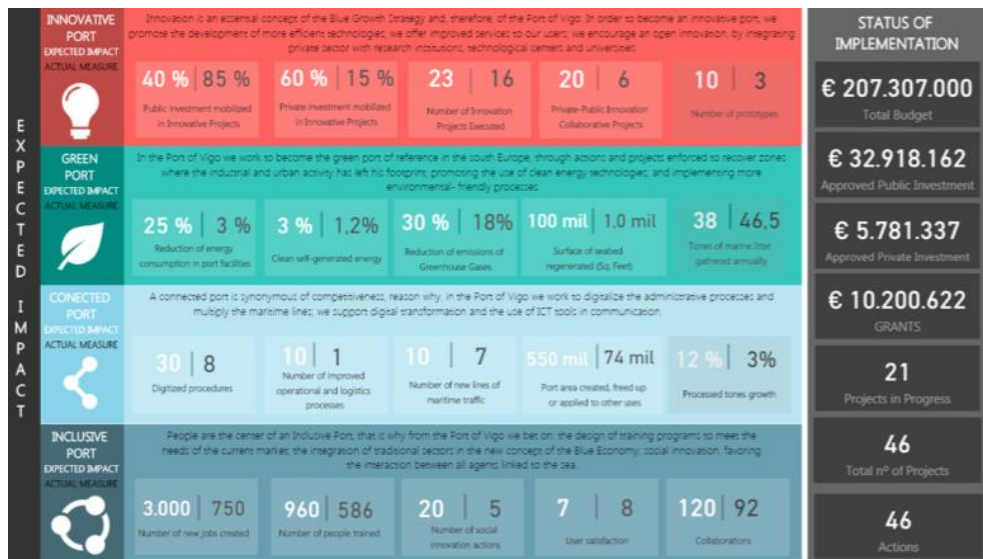


Figura 2: Impacto esperado

3. PRINCIPALES CONCLUSIONES

A partir de la experiencia de diseño e implementación de la estrategia Blue Growth Puerto de Vigo, se extraen las siguientes conclusiones fundamentales:

- La aplicación de enfoque de Economía Azul en procesos de desarrollo territorial permite generar procesos de Crecimiento sostenible.

- La involucración de los grupos de interés es clave desde la perspectiva que la apropiación del Plan por parte de los mismos es necesaria para su viabilidad.
- La implementación de actuaciones concretas es imprescindible para contar con un proceso de desarrollo real en que se observen de forma tangible resultados.
- La medición de impacto es una herramienta necesaria para conocer en qué medida las actuaciones diseñadas son capaces de mejorar indicadores de desarrollo en el ámbito portuario, relacionadas con los Objetivos Azules acordados por los grupos de interés.
- La implementación exitosa, en cuanto a generación de impacto, depende de la disponibilidad de recursos financieros y técnicos suficientes que permitan la existencia de un proceso vivo y continuo en el tiempo.
- Se trata de una Estrategia a medio y largo plazo. Una visión a corto no recoge la esencia del enfoque de Economía Azul, si bien se pueden obtener resultados a corto plazo siempre y cuando el nivel de dinamismo y compromiso de todas las partes sea alto.

La aplicación de estrategias de Crecimiento Azul suponen un nuevo modelo de gestión que integre procesos participativos y enfoques multidisciplinares. La sostenibilidad de este enfoque sólo se mantiene si es incorporada en los procesos estratégicos de las entidades que lo lideran.

Premio Bernardo Pena Jóvenes Investigadores

XXXIII

CONGRESO INTERNACIONAL
DE **ECONOMÍA APLICADA**

Asepelt

2019

economía azul

Universida_{de}Vigo

 **Asepelt**

Asociación Internacional de Economía Aplicada



IS THERE A DAY-OF-THE-WEEK EFFECT IN OVERNIGHT AND DAYTIME PERIODS IN THE US EQUITY MARKET? A RISK-ADJUSTED RETURNS COMPARISON APPROACH

JOÃO DIONÍSIO MONTEIRO¹

Department of Management and Economics, NECE²
University of Beira Interior, Covilhã, Portugal/jdm@ubi.pt

ERNESTO RAÚL FERREIRA

Department of Management and Economics, NECE
University of Beira Interior, Covilhã, Portugal/ferreira@ubi.pt

Abstract

This paper examines the existence of the day-of-the-week effect in overnight and daytime returns in a group of broad-index exchange-traded funds (ETFs) that track the major U.S. stock indexes (S&P 500 and NASDAQ 100) over the period from 1996 to 2018. The analysis is decomposed into two subperiods: 1996-2006 and 2007-2018. To examine this effect, we use a robust Sharpe ratio (SR) approach. Previous empirical studies suggest the existence of a significantly positive overnight minus daytime mean return spread. Our results, however, are not consistent with that suggested by previous studies. Over the two periods and across weekdays, there is no pattern about the sign and significance of the risk premium of overnight vis-a-vis daytime period returns. Over the first period and across weekdays, there are only a few cases where the risk-adjusted returns of stocks held overnight significantly exceed risk-adjusted returns of stocks held during daytime periods. In the second period, there are practically no significant differences between overnight and daytime risk-adjusted returns. Thus, SR results suggest a decrease or even the disappearance of the positive overnight minus daytime mean return spread over the last decade. Overall, the results support the notion that information impounding mechanisms have become more efficient in U.S. markets.

Key words: Overnight and Daytime returns, U.S. equity exchange-traded funds, day-of-the-week effect, Sharpe Ratio.

JEL Classification: C58, G1, G12, G14

Thematic Area 9 : Quantitative Economics. Quantitative Methods for Economics and Business

¹ Corresponding author.

² The authors acknowledge financial support from NECE, a I&D unity funded by Portuguese National Funds through FCT–Fundação para a Ciência e a Tecnologia, Portugal, grant UID/GES/04630/2019.

1. INTRODUCTION

Theoretical and empirical studies have focused their interest on decomposing daily (close-to-close) returns into overnight (close-to-open) and daytime (open-to-close) periods and examining the implications for trading and returns (Hong and Wang, 2000; Barclay and Hendershott, 2003; Branch and Ma, 2006; Cliff *et al.* 2008; Kelly and Clark, 2011; Berkman *et al.*, 2012; Lachance, 2015; Lou *et al.*, 2018). Evidence tends to suggest statistically higher returns during the overnight period. In addition, empirical studies document that the second- and higher-order moments of the return-generating process are different over daytime and overnight periods (Cliff *et al.* 2008; Tompkins and Wiener, 2008) and that risk-adjusted overnight returns are significantly higher than risk-adjusted daytime returns (Kelly and Clark, 2011).

The aforementioned evidence points to the need for further research. Thus, the current study attempts to verify this effect and examine its robustness using the framework of calendar effects. We ground our study in the rationale of market efficiency, with the aim to add to the field of market efficiency an analysis of calendar effects during daytime and overnight period returns in the U.S. equity market of exchange-traded funds (ETFs). Although much less scrutinized with respect to daytime and overnight periods, and specifically within the ETF market, the U.S. equity market has been extensively addressed in calendar effect studies (Pettengill, 2003).

Thus, to the best of our knowledge, a comprehensive analysis using a long period of data and robust approaches regarding day-of-the-week effects during daytime and overnight periods in the U.S. equity market remains to be done.

Thus, we examine the day-of-the-week effect in daytime and overnight returns in a set of two ETFs that track the major U.S. stock indexes during the 1996 – 2018 period. With the aim for comparing results with previous studies and to examine whether there are persistence, decrease, disappearance or even the absence of the effect we divide the entire period into two subperiods: 1996-2006 and 2007-2018. To examine the day-and-night effect, we employ the Sharpe ratio (SR) statistic, using asymptotic distributions that are valid under very general conditions (i.e., stationary and ergodic returns). To control for the robustness in the obtained statistically significant dominances we apply multiple testing procedures to control for the false discovery rate (FDR).

In both ETFs and over the two periods, the obtained results are not consistent with those of previous studies. Before application of the multiple testing procedures to control for the FDR, a small number of dominances are exhibited in which a positive Tuesday overnight effect is the most salient (i.e., Tuesday overnight mean returns are significantly higher than a small number of daytime and overnight mean returns over other days of the week). After applying multiple testing correction procedures, SR dominances disappear. These results lend support to the notion that U.S. equity markets have become more efficient in price discovery mechanisms, particularly at the open and close of markets, in the last decade.

We organize the remainder of the paper as follows: Section 2 reviews theoretical causes, predictions, and empirical evidence for the behavior of returns during daytime and overnight periods. We also review some empirical evidence on calendar effects during daytime and overnight periods. Section 3 presents the data; the SR approach and the asymptotic distributions of the one- and two-sample SR statistical tests. We present and discuss the findings in Section 4 and summarize them along with some concluding remarks in Section 5.

2. LITERATURE REVIEW

Changes in daily transaction regimes, when markets open and close, can have important implications for the return-generating process over daytime and overnight periods. Empirical studies have reported that the mean return, the trading volume, the volatility, and the bid-ask spreads in general have a U-shaped pattern during the intraday period across developed stock markets, with these variables being high at the open and close of the market and relatively flat during the middle of the intraday period (Wood *et al.*, 1985; McNish and Wood, 1992; Foster and Viswanathan, 1993; Abhyankar *et al.*, 1997; Hong and Wang, 2000; Chow, *et al.*, 2004). Less consensus, however, exists about the behavior of the mean return during daytime and overnight periods.

Theoretical papers have sought to model the implications of periodic market closure for equilibrium prices (Longstaff, 1995; Hong and Wang, 2000). Hong and Wang's (2000) model predicts lower returns during overnight periods than during daytime periods, a prediction consistent with the observed higher volatility and information flow rates during daytime periods. Conversely, Longstaff's (1995) model predicts higher returns during overnight periods than during daytime periods to compensate liquidity providers for bearing additional risk (i.e., higher returns over overnight periods arise from a liquidity-related nonmarketability effect).

Wood *et al.* (1985) examine return patterns around the open and the close of the market. They document that the return and volatility are unusually high at the open and close of the daytime period. French and Roll (1986) document that stock returns are more volatile during the daytime period than during the overnight period, attributing the higher volatility during intraday hours to the differences in information flow rates between the two periods. Harris (1989) documents a large mean price increase at the market's open and before market closure, and this effect is persistent across stocks and days. George and Hwang (2001) examine the rate of information flow and find that the daytime information rate is about seven times higher than the overnight rate. Barclay and Hendershott (2003) find that there is less information asymmetry in the postclose period than in the preopen period of the market. Their findings suggest that there will be a higher fraction of liquidity-motivated trades in the postclose period and a higher fraction of informed trades in the preopen period.

With respect to return patterns over daytime and overnight periods, empirical evidence is not consistent across empirical studies. French (1980) first identified the weekend effect using U.S. daily stock returns from 1953 to 1977. French finds a weekend effect such that Monday's mean return is significantly negative, while the other day-of-the-week returns are significantly positive. Rogalski (1984) examines the U.S. stock market from 1974 to 1984 to determine whether the weekend effect is a closed market effect by decomposing daily close-to-close returns into an overnight and daytime return. Rogalski finds that the negative weekend return is composed of a negative Monday overnight return (Friday close to Monday open) and a Monday daytime return (Monday open to close) identical to the daytime returns of other weekdays.

Cliff *et al.* (2008), using data sets of different asset classes for the 1993–2006 period, perform an extensive study in U.S. equity markets on overnight and daytime returns. They document that the U.S. equity premium during this decade is entirely due to overnight returns: returns during the night are strongly positive, and returns during the day are close to zero and sometimes negative. They also show that this daytime and overnight effect exists for individual equities, equity indexes, ETFs, and futures contracts on equity indexes.

Tompkins and Wiener (2008) examine returns for five global index futures markets over daytime and overnight periods. They find significant differences between daytime and overnight period returns. For the U.S. market, the mean return is higher for the daytime period than for the overnight period, with the overnight period showing significantly lower variance.

Kelly and Clark (2011) compare the intraday and overnight returns on a set of U.S. equity ETFs. Using the SR statistic, they find the overnight SR to significantly exceed the daytime SR, implying that the premium one receives by taking on risk is higher during the overnight period than during the daytime period. Qiu and Cai (2013) examine the anomaly of superior overnight returns on international stock markets. Using stock index data for 32 countries, they find that the anomaly exists in 20 countries, including both developed and emerging markets, and that the superior overnight returns are not justified by the risk-return trade-off, as overnight returns are less volatile than daytime period returns. Using all listed U.S. stocks in the 1995–2014 period, but not including ETFs, Lachance (2015) finds evidence that overnight returns are subject to highly persistent and positive biases in a large group of stocks. Lou *et al.* (2018) find that abnormal returns related to momentum portfolios are present overnight but not during the day while abnormal returns related to size and value portfolios occur only during the day.

Several arguments have been forwarded to explain this overnight effect, namely, the timing of earning announcements, asset liquidity, and investor trading heterogeneity. The timing-of-earnings-announcement hypothesis suggests that managers tend to disclose good news during the overnight period, particularly before the opening of the markets. However, empirical evidence is not consistent with this hypothesis (Patell and Wolfson, 1982; Damadoram, 1989; Bagnoli *et al.*, 2005; Doyle and Magilke, 2009). The asset liquidity hypothesis (Amihud, 2002) suggests that the higher (lower) risk or transaction costs of low-liquidity (high-liquidity) stocks predict a greater (less) overnight minus daytime return spread. However, evidence does not generally support this hypothesis (Cliff *et al.*, 2008). Investor trading heterogeneity during daytime and overnight periods has also been suggested to be a contributor to the effect. Barclay and Hendershott (2003) report that there is a higher fraction of liquidity-motivated trades in the postclose period and a higher fraction of informed trades in the preopen period, because trading in the preopen period is dominated by more informed investors. Kelly and Clark (2011) attribute the overnight effect to the behavior of active day (semiprofessional) traders.

Overall, the results of the empirical studies we have examined are not entirely consistent. Some point to the existence of higher overnight returns across all the individual assets of the sample, others report that the effect is confined to a group of assets, and still others report an inverse effect. These empirical findings motivate us to carry out the present study to further investigate overnight and daytime effects in the U.S. equity market, examining whether, in the day-of-the-week-effect context, these effects are actually manifest or if they diminished and disappeared.

3. DATA AND METHODOLOGY

3.1 DATA

The data we employ in this study are actual opening and closing daily prices from a group of two ETFs that track major U.S. equity market indices. The two ETFs we use are the Standard and Poor's Depository Receipts (SPDRs or 'spiders' - ticker SPY, representing the S&P 500 index) and the Invesco PowerShares QQQ Trust (representing the NASDAQ 100 index - ticker QQQ). The data series were collected from Datastream. ETFs allow investors to trade a basket of stocks in a single transaction. The creation and destruction features of the ETF ensure that prices on the exchange closely reflect the fair value of the underlying portfolio's components.

Analysis of the ETFs' returns offers advantages over analysis of the indices' returns for two reasons. First, the share price of an ETF is the price for the entire portfolio, with no problem of asynchronous transactions on certain stocks in the index. Second, ETFs that track major stock market indices are highly liquid, with very low transaction costs (bid-ask spreads) involved in the trading of these instruments. In addition, two specific and useful features of ETFs are that the transaction is an in-kind trade (i.e., securities are traded for securities) and they are generally more tax efficient.

Kelly and Clark (2011) previously used our ETF sample in their analysis of overnight and daytime SR over the period 1996–2006. This set of ETFs began trading on the exchanges during different years. The SPY started trading in 1993, but its liquidity was poor during the first half of 1990s. For each ETF, to determine the starting point of the analysis, we follow the liquidity criterion used by Kelly and Clark.³ Thus, SPY time-series data are used from 01/02/1996 (mm/dd/yyyy) and the QQQ time-series data are used from 03/11/1999 to 12/31/2018.

For each ETF, we compute returns during the two daily subperiods: the overnight (close-to-open prices) and the daytime (open-to-close prices) returns. As in most of the analysis of daily and intraday financial data, we work with continuously compounded returns, and we compute the overnight and daytime returns, respectively, as follows:

$$\begin{aligned} r_t^n &= \ln \left[P_t^o / P_{t-1}^c \right] \cdot 100\%, \\ r_t^d &= \ln \left[P_t^c / P_t^o \right] \cdot 100\%, \end{aligned} \quad (1)$$

where P_t^o is the ETF price level at the open of day t , P_t^c is the ETF price level at the close of day t , and P_{t-1}^c is the ETF price level at the close of day $t-1$. The average returns are geometric averages, and therefore, the sign indicates whether the ETF gained or lost value during these intraday ranges over the sample period. For each ETF return time series, we computed overnight and daytime returns for each day of the week. We computed Monday overnight returns as Friday close to Monday open, Monday daytime returns as Monday open to close, Tuesday overnight returns as Monday close to Tuesday open, Tuesday daytime returns as Tuesday open to close, and so on. We excluded from the study any week with fewer than five trading days⁴ in order to fulfil the requirement of equal sample size across days of the week. Returns over the extended close following the September 11, 2001 tragedy were not taken into account. We formed the portfolio of each weekday subperiod (overnight and daytime) by grouping the returns of the same weekday subperiod over the entire sample period. For each ETF, after forming the portfolio of each weekday sub-period, we performed pairwise comparisons between all these portfolios using inference procedures on the SR metric to examine the hypothesis of overnight and daytime effects on U.S. equity ETFs.

3.2 THE SHARPE RATIO (SR) APPROACH

The SR approach involves computing, for each ETF, the SR for overnight and daytime returns for each day of the week, testing statistical significance, and making pairwise comparison inferences among all daily subperiod returns of the week. The mean-variance model and the SR metric are frequently used methods to evaluate the performance of investments. The consistency of these criteria with expected utility theory depends on the existence of normal return distributions and investors having preferences according to quadratic utility functions (Feldstein, 1969; Hakansson, 1972) or on both portfolio returns belonging to the same location-scale family or the same linear combinations of location-scale families (Wong, 2007). However, quadratic utility functions have undesirable features—namely, they exhibit increasing absolute and

³ For each ETF, we did not use data from years in which the 5th percentile time of the first trade of the day was not in the first ten minutes of the trading day or from years in which the 5th percentile time of the last trade before 4 pm was not between 3:50 pm and 4:00 pm (Kelly and Clark, 2011).

⁴ We excluded weeks that included the following holidays: New Year Day, Martin Luther Jr. King Day (the third Monday in January), President's Day (the third Monday in February), Good Friday (Easter), Memorial Day (the last Monday in May), Independence Day (July 4), Labor Day (the first Monday in September), Thanksgiving Day (the fourth Thursday in November), and Christmas Day.

relative risk-aversion functions that are not consistent with empirical evidence on investor behaviors. However, given the broad use of the SR in the evaluation and ranking of investments, we use SR in this study.

This SR statistic is a risk-adjusted performance measure that assesses the average excess return (beyond a risk-free rate) of a portfolio relative to its volatility, as measured by its standard deviation. In the SR calculation, we use the following sample counterpart,⁵ dividing the average risk premium by the volatility of the risk premium (Sharpe, 1966, 1994):

$$\widehat{SR} = \frac{\widehat{\mu}_e}{\widehat{\sigma}_e}, \quad (2)$$

where $\widehat{\mu}_e$ is the sample mean of the excess returns of a portfolio beyond some risk-free rate (r_f),

$\widehat{\mu}_e = \sum_{t=1}^T r_{et}/T$, $r_{et} = (r_t - r_{ft})$, and $\widehat{\sigma}_e = \sqrt{\frac{1}{T} \sum_{t=1}^T (r_{et} - \widehat{\mu}_e)^2}$ is the sample standard deviation of the excess returns. The debate

over the importance of this statistic for the evaluation of investment performance has been extensive. This metric tends to be useful⁶ although much of the research uses asymptotic distributions of \widehat{SR} based on unsuitable assumptions (i.e., using independent and identically distributed [i.i.d.] normality of returns [Jobson and Korkie, 1981]). Mertens (2002) goes a step further and proposes the asymptotic distribution for i.i.d. general returns. Christie (2005) derives the asymptotic distributions that are valid under very general conditions (i.e., stationary and ergodic returns), thus permitting time-varying conditional volatilities, serial correlation, and otherwise non-i.i.d. return behavior. Opdyke (2007) derives the asymptotic distribution of \widehat{SR} that generalizes the i.i.d. requirement of Mertens (2002) and simplifies the more complex formula of the asymptotic distributions of Christie (2005), making it more mathematically tractable and far easier to calculate and implement when conducting hypothesis tests. Opdyke (2007) demonstrates that his estimators, under real-world conditions of returns, show a reasonable level of control and good power for sample sizes up to 300 time periods.

We perform two statistical tests. First, for each ETF and for each day-of-the-week and daily subperiod return, we test the significance of the SR. This test enables us to examine whether respective daytime and overnight period returns earned a significant, positive or negative, risk premium. Second, for each ETF and among days of the week and daily subperiods, we test whether SRs between any two portfolios are significantly different. This test enables us to examine whether a daytime or overnight period return earned a significantly higher risk-adjusted return than another daytime or overnight period. For this purpose, we use Opdyke's (2007) asymptotic distributions, which we present next.

3.2.1 ASYMPTOTIC DISTRIBUTIONS FOR ONE- AND TWO-SAMPLE ESTIMATORS FOR SR

To test the hypothesis of whether the SR of one portfolio is statistically significant—that is, $H_0: SR = 0$ versus $H_a: SR \neq 0$ —we use the following asymptotic distribution of \widehat{SR} , which is valid under very general conditions (i.e., stationary and ergodic returns):

$$\sqrt{T}(\widehat{SR} - SR) \sim N\left(0; 1 + \frac{SR^2}{4} \left[\frac{\mu_4}{\sigma^4} - 1 \right] - SR \frac{\mu_3}{\sigma^3} \right), \quad (3)$$

where the estimated standard error is $Se(\widehat{SR}) = \sqrt{\left(1 + \frac{\widehat{SR}^2}{4} \left[\frac{\widehat{\mu}_4}{\widehat{\sigma}^4} - 1 \right] - \widehat{SR} \frac{\widehat{\mu}_3}{\widehat{\sigma}^3} \right) / T}$.

To test the hypothesis of whether the SR of portfolio Y is significantly different from the SR of portfolio Z —that is, $H_0: SR_Y = SR_Z$ versus $H_a: SR_Y \neq SR_Z$ —we use the following asymptotic distribution of the difference

⁵In the use of this statistic, other versions are used in which it is assumed that although r_f is not literally constant during the period used to calculate SR, it has a very small variance in relation to risky investment, being their mean treated as its constant value (Lo, 2002; Christie, 2005). Given that the risk-free rate proxy used in the present study varies over time, we chose to use the version of equation (2) instead of using the average risk-free rate over the period. This version does not influence calculations and inference because its covariance with overnight and daytime returns is null.

⁶Eling and Schuhmacher (2007) present strong evidence, even under highly nonnormal returns conditions, in support of the SR approach compared with other more complex risk-adjusted performance metrics.

between two SRs⁷: $\widehat{SR}_{diff} = (\widehat{SR}_y - \widehat{SR}_z) - (SR_y - SR_z)$,

$$\sqrt{T}(\widehat{SR}_{diff}) \sim N(0; \text{Var}_{diff}), \quad (4)$$

and

$$\begin{aligned} \text{Var}_{diff} = & \left(1 + \frac{SR_y^2}{4} \left[\frac{\mu_{4y}}{\sigma_y^4} - 1 \right] - SR_y \frac{\mu_{3y}}{\sigma_y^3} \right) + \left(1 + \frac{SR_z^2}{4} \left[\frac{\mu_{4z}}{\sigma_z^4} - 1 \right] - SR_z \frac{\mu_{3z}}{\sigma_z^3} \right) - 2 \\ & \left(\rho_{y,z} + \frac{SR_y SR_z}{4} \left[\frac{\mu_{2y,2z}}{\sigma_y^2 \sigma_z^2} - 1 \right] - \frac{1}{2} SR_y \frac{\mu_{1z,2y}}{\sigma_z \sigma_y^2} - \frac{1}{2} SR_z \frac{\mu_{1y,2z}}{\sigma_y \sigma_z^2} \right), \end{aligned} \quad (5)$$

where $\mu_{2y,2z} = E[(y - E(y))^2(z - E(z))^2]$ is the joint central moment of the joint distribution of y and z and $\mu_{1y,2z} = E[(y - E(y))(z - E(z))^2]$ and $\mu_{1z,2y} = E[(z - E(z))(y - E(y))^2]$. Minimum variance unbiased estimators for these three terms appear in Appendix C of Opdyke (2007).

For each ETF, day-of-the-week and daily subperiod respective returns are converted to risk premiums by subtracting a risk-free interest rate proxy obtained from the Federal Reserve Economic Data available at the St. Louis Federal Reserve website. The interest rate used is the daily secondary market rate of the three-month U.S. Treasury Bill. The number of days of interest subtracted from the daily subperiod returns is determined by the difference between the trading day and the settlement date, as payment for purchases and proceeds from sales are due on settlement date. We assume that transactions made on Monday and Tuesday have three calendar days of interest subtracted and that transactions made on Wednesday, Thursday, and Friday have five calendar days of interest subtracted.⁸ The equivalent daily risk-free rate that is subtracted is calculated as $sr_{daily,t}^f = [\ln(1 + r_{annum,t}^f) / 365] \cdot 100\%$. Only the overnight returns have the risk-free rate subtracted. The daytime returns, which have both transactions in the same day, have the same settlement date. Because two offsetting trades with the same settlement date do not require funding, the realized daytime return is equal to the realized daytime risk premium.

4. EMPIRICAL RESULTS

Table 1 shows descriptive statistics for the daytime and overnight returns for the examined U.S. equity ETFs, decomposed by days of the week during the entire sample period. Specifically, the table presents the mean return, standard deviation, skewness, kurtosis, the Jarque-Bera test for the normality hypothesis, the Welch two-sample F -test for the equality of means, and the two-sample Brown-Forsythe test for the equality of standard deviations. Across ETFs and for days of the week, there is a tendency for the higher mean return to occur during overnight than during the daytime period. During the daytime period and for each day of the week, except on Friday for QQQ, average returns are not significantly different from zero. The aforementioned day is significantly negative.

For the overnight period on Monday and Tuesday in both ETFs and on Thursday for QQQ, average returns are significantly different from zero. In these five cases, mean returns are significantly positive. The overall overnight average returns on both ETFs are also significantly positive. Upon first consideration, there does not seem to be a marked day-of-the-week effect in the overnight and daytime returns across the ETF group and over the entire period. Across ETFs, there are three common patterns: the Monday, Tuesday and overall overnight mean returns are significantly positive.

Table 1: Descriptive statistics for overnight and daytime returns by day of the week and ETFs - 1996-2018 sample period

⁷ Opdyke (2007) only rigorously proves the validity of the variance formula for the two-sample test in the i.i.d. general case. Because this distribution was derived using the delta method, the same as that used to derive the distribution for the one-sample test that proved to be identical to Christie's (2005) more generally valid generalized method of moments, Opdyke conjectures that it is also valid under the more general conditions of stationarity and ergodicity.

⁸ See <https://www.sec.gov/news/press-release/2017-68-0>. This is due to T+3 settlement regime during the sample period.

Exchange Traded Fund		Mean (%)	Std. dev. (%)	Skewness	Kurtosis	J.B.-test ^a	W-test ^b	B.F.-test ^c	
SPY									
Daytime	Monday	-0.026	1.048	-0.812	13.713	5131***	2.138**	70***	
	Tuesday	0.014	1.063	0.373	12.401	3999***	1.053	122***	
	Wednesday	0.009	1.021	0.107	12.032	3999***	0.465	151***	
	Thursday	-0.009	1.012	-0.802	12.774	4717***	0.903	135***	
	Friday	-0.039	0.942	0.051	5.788	364***	1.395	62***	
	All	-0.010	1.017	-0.212	11.788	18009***	2.668***	525***	
	Overnight	Monday	0.055***	0.678	0.153	16.154	7567***	-	-
		Tuesday	0.053***	0.591	0.261	9.622	1983***	-	-
		Wednesday	0.024	0.569	-0.616	8.017	1308***	-	-
		Thursday	0.021	0.588	-0.270	7.292	899***	-	-
Friday		0.010	0.730	-1.886	26.947	27549***	-	-	
All		0.032***	0.633	-0.647	17.278	47818***	-	-	
QQQ									
Daytime	Monday	-0.049	1.484	0.483	13.987	4577***	1.969**	98***	
	Tuesday	-0.045	1.581	-0.693	7.696	924***	1.913*	134***	
	Wednesday	0.017	1.679	0.879	20.053	12380***	0.311	118***	
	Thursday	0.026	1.520	-0.091	7.410	807***	0.684	135***	
	Friday	-0.108**	1.403	0.019	8.808	1365***	2.639***	60***	
	All	-0.031	1.538	0.170	12.641	18636***	3.277***	540***	
	Overnight	Monday	0.063**	0.878	-0.311	18.091	8583***	-	-
		Tuesday	0.065**	0.762	0.605	8.591	1261***	-	-
		Wednesday	0.035	0.863	0.182	11.096	2767***	-	-
		Thursday	0.064**	0.844	0.648	9.045	1585***	-	-
Friday		0.036	0.983	-0.441	14.003	4930***	-	-	
All		0.052***	0.869	0.044	13.064	20281***	-	-	

Overnight and daytime return time series are from 01/02/1996 to 12/31/2018 for SPY and from 03/11/1999 to 12/31/2018 for QQQ. ^a Jarque-Bera test for normality hypothesis. ^b The Welch F-test for equality of means is the square of the statistic $t = (\bar{x}_1 - \bar{x}_2) / ((s_1^2/n_1) + (s_2^2/n_2))^{0.5}$ (unequal variances), where n_1 and n_2 are the sample sizes, \bar{x}_1 and \bar{x}_2 are the sample means, and S_1^2 and S_2^2 are the samples variances, that follow the t -distribution with ν degrees of freedom, where $\nu = ((S_1^2/n_1 + S_2^2/n_2) / ((S_1^2/n_1)/(n_1-1) + (S_2^2/n_2)/(n_2-1)))$. ^c The test for equality of variances is the Brown-Forsythe test that is robust against many types of non-normality. *, **, *** denote values that are statistically significant at the 10, 5 and 1% levels, respectively.

Volatility of returns (as measured by standard deviation) for each day of the week and across ETFs is higher during the daytime period. This result is consistent with evidence obtained in previous studies (French and Roll, 1986; Lockwood and Linn, 1990; Cliff *et al.*, 2008) and is in line with the hypothesis that the volume of information flow is higher during the daytime than during the overnight period (George and Hwang, 2001). The volatility is also lower in the SPY than in the QQQ, reflecting the higher volatility of the individual stocks that make up the NASDAQ-100 index.

The distributional properties of the return series for both ETFs, days of the week, and daytime and overnight periods do not appear to be normal. For both ETFs and almost every day of the week and daytime and overnight period returns, the return skewness is significant but there does not seem to be a pattern regarding the sign of this parameter. The only exception seems to be Tuesday overnight periods where returns in both ETFs are significantly positively skewed. This result indicates a higher probability than under the normal distribution of obtaining extreme positive returns during the overnight period on Tuesday. The kurtosis across ETFs and days of the week and by daytime and overnight periods is significant, indicating leptokurtic distributions, with the number of extreme returns being greater than under the normal distribution. Finally, the Jarque-Bera statistics, shown in the sixth column of Table 1, reject the null hypothesis of normality of returns in both ETFs, all weekdays, and daytime and overnight periods.

4.1 PARAMETRIC TESTS OF THE MEAN AND VOLATILITY RETURN DIFFERENCES

The last two columns of Table 1 present the test results for equality of means and standard deviations. For each ETF and day of the week, the statistical values are presented for the tests of the difference between the daytime and the overnight period returns. For both ETFs and each day of the week, the null hypothesis of the same variances is rejected at the 1% level, with the overnight volatility being significantly lower than the daytime volatility. These results are consistent with the hypothesis that the volume of information flow that occurs during daytime is significantly higher than that observed during overnight (Stoll and Whaley, 1990).

Regarding average returns, for SPY and throughout days of the week, the results indicate that, in general, differences in average returns between daytime and overnight periods are not, with some exceptions, significant. The Monday and overall overnight average returns are significantly higher than the corresponding daytime average returns. However, for SPY and over the period 1996-2006, our findings on the sign, magnitude and significance of the daytime and overnight period average raw returns across weekdays and

on the equality tests of the average raw returns between daytime and overnight periods are somewhat consistent with those obtained by Cliff *et al.* (2008).

For QQQ and across days of the week, the results also indicate some significant differences. The overnight average return on overall, Monday and Friday are significantly higher than the corresponding daytime average returns. For QQQ and the same period of analysis, i.e. 1999-2006, our results on average returns and volatility (see table A.2. in appendix) are also consistent with those obtained by Kelly and Clark (2011). However, for the 2007-2018 period, the results indicate that there are no significant differences in average returns between daytime and overnight periods. Thus, upon initial consideration, it appears that the overnight and daytime effect found previously has significantly diminished or even disappeared. The effect that persists and is pervasive is the volatility of overnight being significantly lower than the volatility of the corresponding daytime periods.

4.2 SHARPE RATIO (SR) RESULTS

In this section, we present and discuss results of the formal inferences made about SRs. We calculated SR as Sharpe (1966, 1994) suggests, dividing average risk premium by risk premium volatility. This measure shows the magnitude of the risk premium obtained per unit of risk volatility incurred, which is the most adequate for comparing diversified portfolios such as the broadly diversified equity ETFs analyzed in this study.

The SR test results are presented in Table 2 and Table 3. In each table, the bottom row of each period presents the SR value and the statistically significant values of daytime and overnight risk premiums across days of the week. The significant values are for the two-sided, one-sample test statistic of the null hypothesis that SR is not statistically different from zero. This test enables us to analyze whether each daytime and overnight period of the days of the week obtained a significantly risk premium, positive or negative. The statistic of this test is based on the assumptions of stationary and ergodic returns, properties whose risk premiums series of the ETFs verify.

For SPY and over the period 1996-2006, there is only one significant SR, which occurs during the Tuesday overnight period and is significantly positive at the 5% level. Over the period 2007-2018, none of SRs is statistically significant. The QQQ, over the period 1999-2006, exhibit two SRs, which are significantly different from zero; the significantly positive SR also occurs during Tuesday overnight and the significantly negative SR occurs during Tuesday daytime. Over the period 2007-2018 there is only one significant SR, which occurs during the Wednesday overnight period. For all other daytime and overnight periods across weekdays, SRs are not significantly different from zero. In short, in both ETFs, the results exhibit a positive and significant SR during the Tuesday overnight period over the first period and none significant SR during the second period. In addition, in both ETFs, the results show variability in the signal and magnitude of the SRs, from the first to the second period, not supporting the existence of an actually daytime and overnight effect across the days of the week.

With the two-sample SR test, we test whether the SR of portfolio Y is statistically different from the SR of portfolio Z. Significant results from the null hypothesis test statistic for equality between SRs appear in Table 2 and Table 3. For SPY, and over the first and second period, we obtain 7 and 2 significant pairwise comparisons, although two and one of these are only marginally significant, respectively.

For QQQ, over the first and second period, we obtain 12 and 4 significant pairwise comparisons, albeit five and one of these are marginally significant, respectively. For both ETFs and over the first period, significant pairwise comparisons are obtained mostly in cases where the overnight period SRs are significantly higher than daytime period SRs.

Table 2: Sharpe ratio results of overnight and daytime returns by days of the week for the SPDR - SPY

Daily period	Day_T	Day_W	Day_Th	Day_F	Night_M	Night_T	Night_W	Night_T h	Night_F	
1996:01 – 2006:12										
Day(time) M(onday)	ND	ND	ND	ND	ND	< _{i*ii}	ND	ND	ND	
T(uesday)		ND	ND	ND	ND	< _{i*ii}	ND	ND	ND	
W(ednesday)			ND	ND	ND	ND	ND	ND	ND	
Th(ursday)				ND	ND	< _i	ND	ND	ND	
F(riday)					< _i	< _{i*ii}	ND	ND	ND	
(Over)night						ND	ND	ND	ND	
M(onday)										
T(uesday)							> _{i*ii}	> _{i*ii}	ND	
W(ednesday)								ND	ND	
Th(ursday)									ND	
Sharpe ratio values	Day_M	Day_T	Day_W	Day_Th	Day_F	Night_M	Night_T	Night_W	Night_T	Night_F

	-0.023	-0.034	0.009	-0.013	-0.062	0.052	0.104**	-0.053	^h -0.028	0.012
2007:01 – 2018:12										
Day(time) M(onday)	< _i	ND	ND	ND	ND	ND	ND	ND	ND	ND
T(uesday)		ND	ND	ND	ND	ND	ND	ND	ND	> _{i*ii}
W(ednesday)			ND	ND	ND	ND	ND	ND	ND	ND
Th(ursday)				ND	ND	ND	ND	ND	ND	ND
F(riday)					ND	ND	ND	ND	ND	ND
(Over)night M(onday)						ND	ND	ND	ND	ND
T(uesday)							ND	ND	ND	ND
W(ednesday)								ND	ND	ND
Th(ursday)									ND	ND
Sharpe ratio values										
	Day_M	Day_T	Day_W	Day_Th	Day_F	Night_M	Night_T	Night_W	Night_T ^h	Night_F
	-0.063	0.063	-0.017	-0.001	-0.012	0.021	0.034	0.035	0.004	-0.043

The table shows the SR values and the results of the one-(hypothesis of SR value equal to zero) and two-sample Sharpe ratio tests for days of the week by daytime and overnight period returns for the SPDR equity ETF (SPY). The sample period is from 01/02/1996 to 12/31/2018. $Y < (>) X$ means that the SR of Y (row) is significantly lower (greater) than the SR of X (column) based on the two-sample test statistics in equation (4). ND denotes that the SR of Y is not significantly different from the SR of X. *, **, *** denote values that are statistically significant at the 10%, 5% and 1% levels based on two-tailed tests, respectively.

For SPY and over the first period, the results, in terms of significant dominances based on the pairwise p -values of the SR statistics, only seem to support the existence of a consistent and positive effect during the Tuesday overnight period. For QQQ and over the first period, significant dominance relationships in SRs support the existence of a positive effect during the Monday, Tuesday and Thursday overnight period vis-à-vis daytime period of some weekdays. Over the second period, in both ETFs, the previous significant SR pairwise comparisons virtually disappear. This considerable decrease in the significant SR dominance relations is consistent with a decrease and even the disappearance of the day-and-night effect in the US equity ETF market.

The results presented in Tables 2 and 3 exhibit some significant individual SR values and significant pairs of SR dominance based on the pairwise error rate with a false-positive probability of $\alpha = 5\%$. Because the null hypothesis involves a large number of pairwise comparisons in SR tests (i.e., 45 tests⁹), p -values are corrected using multiple testing procedures to control for the false discovery rate (FDR) (i.e., the fraction of tests called significant that are actually true nulls). Because tests involve some degree of dependence (i.e., for each ETF, we test for the equality of SRs among daytime and overnight periods across weekdays), for our FDR procedure, we use Benjamini and Hochberg's (1995) method, with an overall FDR value of $\delta = 5\%$, which is less stringent than Bonferroni and Holm's (1979) methods.

Table 3: Sharpe ratio results of overnight and daytime returns by days of the week for the QQQ - ETF

Daily period	Day_T	Day_W	Day_Th	Day_F	Night_M	Night_T	Night_W	Night_Th	Night_F	
1999:03 – 2006:12										
Day(time) M(onday)	ND	ND	ND	ND	< _i	< _{i*ii}	ND	< _i	ND	
T(uesday)		ND	< _i	ND	< _{i*ii}	< _{i*ii}	ND	< _{i*ii}	< _i	
W(ednesday)			ND	ND	ND	ND	ND	ND	ND	
Th(ursday)				ND	ND	ND	ND	ND	ND	
F(riday)					< _{i*ii}	< _{i*ii}	ND	< _{i*ii}	ND	
(Over)night M(onday)						ND	ND	ND	ND	
T(uesday)							> _i	ND	ND	
W(ednesday)								ND	ND	
Th(ursday)									ND	
Sharpe ratio values										
	Day_M	Day_T	Day_W	Day_Th	Day_F	Night_M	Night_T	Night_W	Night_Th	Night_F
	-0.063	-0.127**	-0.010	0.012	-0.089	0.066	0.103**	-0.042	0.073	0.004
2007:01 – 2018:12										
Day(time) M(onday)	< _i	ND	ND	ND	ND	ND	< _{i*ii}	ND	ND	
T(uesday)		ND	ND	ND	ND	ND	ND	ND	ND	
W(ednesday)			ND	ND	ND	ND	< _i	ND	ND	
Th(ursday)				ND	ND	ND	ND	ND	ND	
F(riday)					ND	ND	< _{i*ii}	ND	ND	

⁹ Number of pairwise comparisons among the 10 return time series (5 daytimes and 5 overnight weekdays) obtained separately for each ETF.

(Over)night M(onday)			ND	ND	ND	ND	ND	ND	ND	ND
T(uesday)				ND	ND	ND	ND	ND	ND	ND
W(ednesday)					ND	ND	ND	ND	ND	ND
Th(ursday)								ND	ND	ND
Sharpe ratio values										
	Day_M	Day_T	Day_W	Day_Th	Day_F	Night_M	Night_T	Night_W	Night_Th	Night_F
	-0.050	0.071	-0.010	-0.003	-0.033	0.024	0.051	0.093**	0.017	0.008

The table shows the SR values and the results of the one-(hypothesis of SR value equal to zero) and two-sample Sharpe ratio tests for days of the week by daytime and overnight period returns for QQQ equity ETF. The sample period is from 03/11/1999 to 12/31/2018. $Y < (>) X$ means that the SR of Y (row) is significantly lower (greater) than the SR of X (column) based on the two-sample test statistics in equation (4). ND denotes that the SR of Y is not significantly different from the SR of X. *, **, *** denote values that are statistically significant at the 10%, 5% and 1% levels based on two-tailed tests, respectively.

After we correct the original p -values of the one- and two-sample SR tests using Benjamini and Hochberg's (1995) method, in both ETFs and periods, all the previous significant individual SR values and significant SR dominance relations disappear. Thus, these results do not support the existence of a pervasive and consistent overnight and daytime effect but, conversely, lend support to the decrease and disappearance of this effect in the U.S. equity market.

In sum, for both ETFs and over the period 1996–2006, there is a reduced number of significant SR differences between overnight and daytime period returns over weekdays. These few significant differences do not allow to claim for the existence of a daytime and overnight effect over weekdays in this period, somehow contradicting the results obtained by previous studies during this same period for these ETFs. In both ETFs and over the period 2007-2018, there are no significant differences between the SRs of overnight and daytime period returns over weekdays. These results do not support the existence of a pervasive and consistent overnight and daytime effect but, conversely, suggest the decrease and disappearance of this effect in the last decade in the US equity market.

5. CONCLUSIONS

This study examines the presence of day-of-the-week effects in overnight and daytime period returns in a group of actively traded broad-index ETFs that track the major stock market indexes in U.S. markets over the period spanning 1996 to 2018: the SPY (S&P 500) and the QQQ (NASDAQ 100 index). We employ the Sharpe Ratio (SR) approach. Formal inferences about the SR approach rely on asymptotic distributions that are valid under very general conditions (i.e., stationary and ergodic returns). For comparative purposes with results obtained by previous studies about this effect on the same asset class, we divided the entire sample period into two sub-periods: 1996-2006 and 2007-2018.

In both ETFs and during the first period, our results exhibit a reduced number of positive and significant differences between risk-adjusted returns of overnight and daytime periods decomposed by days of the week. These results, however, do not allow to contradict the day-and-night effect obtained in previous studies (e.g., Cliff *et al.*, 2008; Kelly and Clark, 2011). In the period 2007-2018, there are practically no significant differences between risk-adjusted returns of overnight and daytime periods decomposed by days of the week. In addition, for both ETFs and periods, after applying multiple testing procedures to control for the false discovery rates, all significant differences disappear.

Overall, our results suggest the decrease and disappearance of the day-and-night effect previously reported by empirical studies in the U.S. equity market, i.e., results suggest a mean return difference reversion toward zero between overnight and daytime returns in recent decades. These results support the notion that the price discovery mechanism in U.S. equity markets has become more efficient.

These results are also consistent with the nature of this asset class; that is, these ETFs are broadly diversified portfolios with a diversification of private information, higher liquidity, and lower transaction costs (bid-ask spreads). The regulatory changes introduced by the Securities and Exchange Commission (2005) could also have contributed to improvements in information impounding at the open and close of the markets and reduced trading activity leeway by specialists in the NYSE and market-makers in the NASDAQ in open and close price discovery.

For market participants, our results imply that they will not have an advantage in timing their trades to benefit from significant overnight minus daytime return differences. For U.S. self-regulatory bodies of securities exchanges, our results suggest no evidence that might indicate deviant behavior on the part of specialists and market-makers in price discovery mechanisms at the open and close of the markets.

REFERENCES

ABHYANKAR A, GHOSH D, LEVIN E, LIMMACK R (1997): Bid-Ask Spreads, Trading Volume and Volatility: Intraday Evidence from the London Stock Exchange. *Journal of Business Finance and Accounting*, 24(3&4): 343-362.

AMIHUD Y (2002): Illiquidity and Stock Returns: Cross-Section and Time Series Effects. *Journal of Financial Markets*, 5(1): 31-56.

BAGNOLI M, CLEMENT M, WATTS S, (2005): Around-the-Clock Media Coverage and the Timing of Earnings Announcements. Available at <http://ssrn.com/abstract=570247>.

BARCLAY M, HENDERSHOTT T (2003): Price Discovery and Trading after Hours. *Review of Financial Studies*, 16(4): 1041-1073.

BENJAMINI Y, HOCHBERG Y (1995): Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing. *Journal of the Royal Statistical Society: Series B*, 57(1): 289-300.

BERKMAN H, KOCH P, TUTTLE L, ZHANG Y (2012): Paying Attention: Overnight Returns and the Hidden Cost of Buying at the Open. *Journal of Financial and Quantitative Analysis*, 47(4): 715-741.

BRANCH B, MA A (2006): The Overnight Return, One More Anomaly. Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=937997.

CHOW E, LEE Y, LIU Y (2004): Intraday Information, Trading Volume, and Return Volatility: Evidence from the Order Flows on the Taiwan Stock Exchange. *Academia Economic Papers*, 32(1): 107-148.

CHRISTIE S (2005): Is the Sharpe Ratio Useful in Asset Allocation? MAFC Research Papers No. 31, Applied Finance Centre, Macquarie University. Available at <https://ssrn.com/abstract=720801>.

CLIFF, MT, COOPER M, GULEN H (2008): Return Differences between Trading and Non-Trading Hours: Like Night and Day. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1004081.

DAMODARAN A (1989): The Weekend Effect in Information Releases: A Study of Earnings and Dividend Announcements. *Review of Financial Studies*, 2(4): 607-623.

DOYLE J, MAGILKE M (2009): The Timing of Earnings Announcements: An Examination of the Strategic Disclosure Hypothesis. *The Accounting Review*, 84(1): 157-182.

ELING M, SCHUHMACHER F (2007): Does the Choice of Performance Measure Influence the Evaluation of Hedge Funds? *Journal of Banking and Finance*, 31(9): 2632-2647.

FELDSTEIN, MS (1969): Mean Variance Analysis in the Theory of Liquidity Preference and Portfolio Selection. *Review of Economics Studies*, 36(1): 5-12.

FOSTER F, VISWANATHAN S (1993): Variations in Trading Volume, Return Volatility and Trading Costs: Evidence on Recent Price Formation Models. *Journal of Finance*, 48(1): 187-211.

FRENCH K (1980): Stock Returns and the Weekend Effect. *Journal of Financial Economics*, 8(1): 55-69.

FRENCH K, ROLL R (1986): Stock Return Variances: The Arrival of Information and the Reaction of Traders. *Journal of Financial Economics*, 17(1): 5-26.

GEORGE T, HWANG C (2001): Information Flow and Pricing Errors: A Unified Approach to Estimation and Testing. *Review of Financial Studies*, 14(4): 979-1020.

HAKANSSON, N (1972): Mean Variance Analysis in a Finite World. *Journal of Financial and Quantitative Analysis*, 7(4): 1873-1880.

HOLM S (1979): A Simple Sequentially Rejective Bonferroni Test Procedure. *Scandinavian Journal of Statistics*, 6(2): 65-70.

HONG H, WANG J (2000): Trading and Returns under Periodic Market Closures. *Journal of Finance*, 55(1): 297-354.

JOBSON J, KORKIE B (1981): Performance Hypothesis Testing with the Sharpe and Treynor Measures. *Journal of Finance*, 36(4): 889-908.

KELLY M, CLARK S (2011): Returns in Trading versus Non-Trading Hours: The Difference is Day and Night. *Journal of Asset Management*, 12(2): 132-145.

LACHANCE M (2015): Night Trading: Lower Risk but Higher Returns? San Diego State University, Available at <https://ssrn.com/abstract=2633476>.

LO A (2002): The Statistics of Sharpe Ratios. *Financial Analysts Journal*, 58(4): 36-52.

LOCKWOOD L, LINN S (1990): An Examination of Stock Market Return Volatility during Overnight and Intraday Periods, 1964-1989. *Journal of Finance*, 45(2): 591-601.

LONGSTAFF F (1995): How Much Can Marketability Affect Security Values? *Journal of Finance*, 50(5): 1767-1774.

LOU D, POLK C, SKOURAS S (2018): A Tug of War: Overnight versus Intraday Expected Returns, London School of Economics. Available at <http://personal.lse.ac.uk/polk/research/OvernightMom20160115.pdf>.

MARKOWITZ, HM (1952): Portfolio Selection. *Journal of Finance*, 7(1): 77-91.

MCINISH H, WOOD R (1992): An Analysis of Intraday Patterns in Bid/Ask Spreads for NYSE Stocks. *Journal of Finance*, 47(2), 753-764.

MERTENS E (2002): Comments on Variance of the IID Estimator in Lo (2002, FAJ), Research Note, November. Available at <http://www.elmarmertens.com/research/discussion>.

OPDYKE JD (2007): Comparing Sharpe Ratios: So Where are the *p*-Values? *Journal of Asset Management*, 8(5): 308-336.

PATELL J, WOLFSON M (1982): Good News, Bad News, and the Intraday Timing of Corporate Disclosures. *Accounting Review*, 57(3): 509-527.

PETTENGILL G (2003): A Survey of the Monday Effect Literature. *Quarterly Journal of Business and Economics*, 42(3/4): 3-28.

QIU, M, CAI T (2013): On Overnight Return Premiums of International Stock Markets. Available at <http://www.nzfc.ac.nz/archives/2013/programme/>.

ROGALSKI R (1984): New Findings Regarding Day-of-the-Week Returns over Trading and Non-Trading Periods: A Note. *Journal of Finance*, 39(5): 1603-1614.

SEC (2005): Securities and Exchange Commission, Regulation NMS: Final Rules and Amendments to Joint Industry Plans. Washington, D.C., 2005. (<http://www.sec.gov/rules/final/34-51808.pdf>).

SHARPE W (1966): Mutual Fund Performance. *Journal of Business*, 39(1): 119-138.

SHARPE W (1994): The Sharpe Ratio. *Journal of Portfolio Management*, 21(1): 49-58.

STOLL H, WHALEY R (1990): Stock Market Structure and Volatility. *Review of Financial Studies*, 3(1): 37-71.

TOMPKINS R, WIENER Z (2008): Bad Days and Good Nights: A Re-Examination of Non-Traded and Traded Period Returns, Available at <https://ssrn.com/abstract=1102165>.

WONG, WK (2007): Stochastic Dominance and Mean-Variance Measures of Profit and Loss for Business Planning and Investment. *European Journal of Operational Research*, 182(2): 829-843.

WOOD R, MCINISH T, ORD J (1985): An Investigation of Transaction Data for NYSE Stocks. *Journal of Finance*, 40(3): 723-739.

APPENDIX

Table A.1: Descriptive statistics of overnight and daytime returns by day of the week for SPDR (SPY) ETF

	Mean (%)	Std. dev. (%)	Skewness	Kurtosis	J.B.-test ^a	W-test ^b	B.F.-test ^c
1996:01 – 2006:12							
Daytime Monday	0.006	1.093	-1.125	10.817	1387***	1.454	89***
Tuesday	-0.032	1.098	0.672	12.408	1949***	4.042**	124***
Wednesday	0.011	1.058	0.830	9.956	1199***	0.067	126***
Thursday	-0.023	0.980	0.198	5.690	169***	0.954	113***
Friday	-0.062	1.021	-0.064	4.773	70***	5.425***	71***
All	-0.019	1.049	0.112	9.172	4248***	9.263***	522***
Overnight	0.072***	0.547	0.036	7.484	421***	-	-
Monday							
Tuesday	0.073***	0.494	0.047	9.581	934***	-	-
Wednesday	0.024	0.534	-0.693	8.212	682***	-	-
Thursday	0.023	0.546	-0.523	7.672	526***	-	-
Friday	0.059**	0.652	-0.877	10.227	1237***	-	-
All	0.050**	0.557	-0.497	9.226	4427***	-	-
2007:01 – 2018:12							
Daytime Monday	-0.057	1.004	-0.455	17.400	4736***	3.227*	9.17***
Tuesday	0.057	1.029	0.057	12.483	2102***	0.200	24.55***
Wednesday	0.006	0.988	-0.709	14.381	3354***	0.147	41.82***
Thursday	0.001	1.041	-1.569	17.863	5788***	0.125	40.23***
Friday	-0.018	0.864	0.253	7.133	424***	0.114	9.790***
All	-0.001	0.987	-0.568	14.791	17014***	0.635	113***
Overnight	0.040	0.780	0.213	16.109	3914***	-	-
Monday							
Tuesday	0.034	0.668	0.370	8.747	784***	-	-
Wednesday	0.024	0.601	-0.560	7.727	601***	-	-
Thursday	0.018	0.626	-0.112	6.888	380***	-	-
Friday	-0.035	0.792	-2.324	32.491	21839***	-	-
All	0.016	0.696	-0.677	19.254	32257***	-	-

Overnight and daytime daily return time series are from 01/02/1996 to 31/12/2018. ^a Jarque-Bera test for normality hypothesis. ^b The Welch F-test for equality of means is the square of the statistic $t = (\bar{x}_1 - \bar{x}_2) / ((s_1^2/n_1) + (s_2^2/n_2))^{0.5}$ (unequal variances) where n_1 and n_2 are the sample sizes, \bar{x}_1 and \bar{x}_2 are the sample means, S_1^2 and S_2^2 are the samples variances, that follow the t-distribution with ν degrees of freedom where $\nu = ((s_1^2/n_1 + s_2^2/n_2)^2) / ((s_1^2/n_1)^2/(n_1-1) + (s_2^2/n_2)^2/(n_2-1))$. ^c The test for equality of variances is the Brown-Forsythe test that is robust against many types of non-normality. *, **, *** denote values that are statistically significant at the 10, 5 and 1% levels, respectively.

Table A.2: Descriptive statistics of overnight and daytime returns by day of the week for QQQ ETF

	Mean (%)	Std. dev. (%)	Skewness	Kurtosis	J.B.-test ^a	W-test ^b	B.F.-test ^c
1999:03 – 2006:12							
Daytime Monday	-0.051	1.946	0.668	10.573	877***	1.713	74***
Tuesday	-0.226**	2.063	-0.477	4.800	62***	7.586***	97***
Wednesday	0.030	2.281	1.051	13.970	2074***	0.076	63***
Thursday	0.058	1.990	-0.078	5.438	97***	0.282	73***
Friday	-0.202**	1.834	0.151	6.773	228***	6.686***	37***
All	-0.075	2.033	0.345	9.330	3200***	8.571***	341***
Overnight	0.099*	0.988	0.692	9.613	677***	-	-
Monday							
Tuesday	0.098**	0.897	0.879	7.830	400***	-	-
Wednesday	-0.004	1.131	0.382	8.525	517***	-	-
Thursday	0.119**	1.074	0.753	7.434	358***	-	-
Friday	0.085	1.176	0.143	8.781	534***	-	-
All	0.078***	1.061	0.497	8.730	2669***	-	-
2007:01 – 2018:12							
Daytime Monday	-0.048	1.085	-0.452	9.945	1118***	2.338	31***
Tuesday	0.072	1.154	-0.508	11.781	1826***	0.260	46***
Wednesday	0.008	1.129	-0.931	10.709	1604***	1.046	73***
Thursday	0.002	1.114	-0.218	6.549	320***	0.235	75***
Friday	-0.047	1.026	-0.089	6.016	223***	0.914	24***
All	-0.002	1.103	-0.455	9.227	4804***	2.368	239***
Overnight	0.039	0.798	-1.588	28.752	15344***	-	-
Monday							
Tuesday	0.043	0.660	0.026	7.627	500***	-	-
Wednesday	0.061**	0.629	-0.388	7.380	504***	-	-
Thursday	0.028	0.652	-0.143	5.618	174***	-	-
Friday	0.004	0.834	-1.572	21.860	8957***	-	-
All	0.035***	0.717	-0.993	19.089	31876***	-	-

Overnight and daytime daily return time series are from 03/11/1999 to 12/31/2018 for QQQ. ^a Jarque-Bera test for normality hypothesis. ^b The Welch F-test for equality of means is the square of the statistic $t = (\bar{x}_1 - \bar{x}_2) / ((s_1^2/n_1) + (s_2^2/n_2))^{0.5}$ (unequal variances) where n_1 and n_2 are the sample sizes, \bar{x}_1 and \bar{x}_2 are the sample means, S_1^2 and S_2^2 are the samples variances, that follow the t-distribution with ν degrees of freedom where $\nu = ((S_1^2/n_1 + S_2^2/n_2)^2) / ((S_1^2/n_1)^2/(n_1-1) + (S_2^2/n_2)^2/(n_2-1))$. ^c The test for equality of variances is the Brown-Forsythe test that is robust against many types of non-normality. *, **, *** denote values that are statistically significant at the 10, 5 and 1% levels, respectively.

1.^{er} accesit Premio Bernardo Pena Jóvenes Investigadores

XXXIII

CONGRESO INTERNACIONAL
DE ECONOMÍA APLICADA

Asepelt

2019

economía azul

Universidade de Vigo

 Asepelt

Asociación Internacional de Economía Aplicada



MEASURING THE EFFECT OF HUMAN CAPITAL AS A SOURCE OF VALUE IN THE WOOD SECTOR OF GALIZA AND PORTUGAL (2002- 2017)

AMÂNDIO F. C. DA SILVA

PhD. Student/Universidade de Vigo/Vigo, Spain
amandio_dasilva@yahoo.co.in

CARLOS-MARIA FERNANDEZ JARDÓN

Universidade de Vigo/Vigo, Spain
cjardon@uvigo.es

e-mail Amândio F.C. Da Silva: amandio_dasilva@yahoo.co.in

Abstract

Purpose - While different approaches have been used to measure the human capital effect on company performance, it is less common testing the effects of the human capital as a source of value in a mostly unorganized sector like the wood and related industries in the Galiza (Spain) / Portugal region. This paper aims at measuring the effect of a single dimension of intellectual capital (human capital) and its value addition for the period of 2002-2017.

Design/methodology/approach – The wood sector was divided into three major groups, namely: extraction, conversion and finished products, and using a panel data model, we measured the value addition created by human capital to the wood sector.

Findings – Human capital is the main dimension that adds value to the wood sector, both in Portugal as well as in Galiza, Spain. Our findings match the previous studies in several other industries and parts of the world.

Research limitations/implications – This paper took an extensive data set ranging from 2002 to 2017 but is limited to a relatively small region (Galiza - north of Spain and Portugal). The findings can be different if the area is expanded and/or other regions are covered.

Practical implications – This paper suggests that the investment in human capital is advisable for local companies in the wood sector of Galiza (Spain) and Portugal, that is operating mainly in the unorganized sector/SMEs, as the correlation between the human capital investments and the value addition is positive.

Originality/value – This paper tests a new model to measure the effect of human capital, one of the three types of capital that compose intellectual capital to study its effects on the value addition to the wood sector.

Key Words: Intellectual capital, human capital, wood sector, value addition.

Eje Temático 5 : Economía Ambiental y de Recursos Naturales no marinos

1. INTRODUCTION

Forestry has a long history in Europe since the middle ages, over-exploitation becoming common with the growth of population (Angelstam *et al.*, 2005) and in the last decades of the 20th century, attempts have been made to establish a regulatory framework for forestry management and protection through inter-governmental agreements (Sayer & Maginnis, 2015). Forestry still complements traditional agriculture production, generating income in less dense zones while giving jobs to people (Mourão & Martinho, 2016) and while the paper and pulp industries are dominated by a small number of multinationals, forests are mostly owned by local people trying to improve their livelihood (Sayer & Maginnis, 2015). It is still considered an important economic sector making an important economic effect in the rural areas of many EU countries (Slee, 2006).

Galiza is a province in northwestern Spain characterized by a high relative percentage of its total forest area (around 11% of the total forest area of the country) (Marey-Perez, Diaz-Varela & Calvo-Gonzalez, 2014), accounting for half the Spanish production of timber. 98% of the forests are privately owned (Caballero, 2015). Portugal was EU's third largest producer of paper and pulp in 2010 and overall the forests and related industries accounted for 1,3% of the country's GDP in 2009 (Sarmiento & Dores, 2013).

Though there have been various studies in the areas of knowledge management and intellectual capital, very few have been specifically made on the Portugal – Spain (Galiza) region on the wood sector and related industries that are dominated by SMEs with very few large, publicly traded companies. Some studies on the timber industry of Argentina and Latin America were found (F-Jardón & Martos, 2009, 2012, 2014), (F-Jardón & Silva, 2017), but none on the Portuguese – Spanish Galiza area, as far as intellectual capital or human capital is concerned. The studies on Portugal-Spain were mainly related to forest management (Carvalho-Ribeiro & Lovett, 2011) or ownership issues (Marey-Perez, Diaz-Varela & Calvo-Gonzalez, 2014).

2. THE MEANING OF HUMAN CAPITAL

One of the earliest definitions of intellectual capital was given by Stewart (1991) where he defined it as sum of patents, processes, management skills, technologies, information on clients and suppliers and overall experience that gives an edge to the company in the market place. The term 'Intellectual capital' is normally taken as a misnomer, often understood to be of relevance to only high-technology industries and information and communication technology companies, but it is essentially relevant for every business organization (Purohit & Tandon, 2017). Intellectual capital comprises those intangible assets that may generate future benefits for the organization and that create key competitive advantages for the business and are invisible, not easily quantifiable or acquirable or valued monetarily (Lopes & Martins, 2006).

Many researchers in the area agree that intellectual capital should be classified into three types of capital: human capital, structural capital and customer/relational capital (Saint Onge, 1996); (Sveiby, 1998); (Bontis, 1998); (Bozbura, 2004). Customer/relational capital was separated from the original classification of two

types of capital (human capital and structural capital given by Edvinsson & Malone, 1996), namely from the structural capital and was defined as the summation of relationships, interactions, and intimacy of an organization with its customers (Stewart, 1994).

In this context, this paper only studies the human capital.

3. HUMAN CAPITAL EFFICIENCY

Efficiency of intellectual capital is a concept that describes how (efficiently) a company's intellectual capital creates value for it. In other words, it describes the productivity of intangible assets (Kujansivu & Lönnqvist, 2007). Human capital that encompasses all aspects of human behavior in the working environment is at the primary stage of intellectual capital efficiency (Nourani, Chandran, Kweh & Lu, 2018). Human capital efficiency (HCE) measures the value added by the human resources of an organization (Rahim, Atan & Kamaluddin, 2017).

As per Kucharčíková, Tokarčíková & Blašková (2015), although that there is no single methodology for measuring the efficiency of human capital, there is a set of several recommendations that each company should follow when measuring the efficiency of its own human capital:

- Identify basic indicators measuring human capital, which have a clear connection with company performance.
- Use simple measurements and indicators and focus on easily accessible and reliable quantitative information.
- Compare indicators set to the required level, which may be created by company standards, compared based on the benchmarking with companies from the same industry, rate of achievement of the objectives, etc.
- Identify unique specifications of human capital that are necessary for the performance of the position and evaluate objectively whether employees really have them, or whether they need training.
- Keep in mind that the measurement of human capital is carried out to increase its effectiveness in relation to company performance, and therefore, it is necessary not only to do measurement, but also identify deficiencies and problem areas and take measures to improve.
- All measures to increase the efficiency of human capital are considered an investment in human capital and they need to be evaluated.

As per Pulic (2000), human capital (HC) can be calculated using the company's total salaries and wages, and the human capital efficiency (HCE) as a ratio of the value added (VA) to the human capital (HC), where $HCE = VA / HC$. Here VA is the difference between the total sales (OUTPUT) and material costs (INPUT). VA can also be calculated as the sum of operating profits (OP), employee costs (EC), depreciation expenses (DP) and amortization expenses (AM).

We have however, not used Pulic's formula of VAICTM as it simply indicates the efficiency of a company's labor and capital investments, and has nothing to do with intellectual capital, making it an invalid measure to measure intellectual capital (Stále, Stále & Aho, 2011), and suggested instead, a new measurement using

panel data model approach.

Empirical studies of Greek listed companies suggest that there is a significant relationship between human capital efficiency and the return on equity of the companies, implying that the development of human resources is one of the significant factors of the country's economic success (Madininos *et al.*, 2011).

4. DOES HUMAN CAPITAL CREATE VALUE?

One of the greatest challenges for human capital researchers is to prove that human capital creates value (Česynienė & Stankevičienė, 2011).

Human capital is the life of intellectual capital, being the most difficult to measure and evaluate. It is not owned by the company, it can only be "rented" (i.e. in the form of employees' wages). It can be divided into: tacit knowledge and explicit knowledge. Tacit knowledge is extremely difficult to explain or write down, being the knowledge that people do not even realize they have as it is embedded in their brains. Explicit knowledge is what can be captured, explained in words, traded, or sold. This knowledge usually remains with the company after an employee leaves, given that it was recorded in some way (Kaya, Sahin & Gurson, 2010). In the case of SMEs, the entrepreneur and the inventor are pure human capital as they nurture the idea or concept of the investment (Hisrich & Peters, 2008). Explicit knowledge sharing has a greater effect on financial performance than on operational performance, whereas tacit knowledge sharing has a greater impact on operational performance than on financial performance (Wang, Wang & Liang, 2014).

Human capital, if managed properly, can create value for the firm in the shape of increased revenue, improved customer satisfaction, enhanced quality of the products and services, increased productivity and reduced costs. This statement suggests that the human factor can increase the value of the firm and value produces competitive advantage (Mangi, 2009).

Several authors studied the correlation between investments in human capital and value creation for the firm in different sectors in different parts of the world, namely Riahi-Belkaoul (2003), Mavridis (2004), Chen *et al.* (2005), Tseng & Goo (2005), Ng (2006), Pew *et al.* (2007), Kamath (2008), Shih (2010), Maditinos *et al.* (2011), Komnenic & Pokrajčić (2012), Liepė & Sakalas (2014), Andreeva & Garanina (2016), McDowell *et al.* (2018), among others. Their findings and conclusions are mostly consensual as it was proved that investments in human capital have a positive effect on value creation and profitability, both for the manufacturing sector as well as the services sectors, even in the case of small organizations that often invest heavily in intellectual capital through their employees, communications, and processes and leverage such investments to foster innovation within the company (Maes & Sels, 2014).

A generally accepted consensus is that human capital is considered the most important element of competitive advantage in most organizations and includes all the competencies of the people within the organization (Memon, Mangi & Rohra, 2009). As people mean everything, human capital is thus the most important capital (Hitt & Duane, 2002). The impact of human capital in value creation is widely acknowledged as an important issue (Coco, Jamison & Black, 2011).

Even from a macroeconomic point of view, OECD (2002) recognizes human capital as the primary driver of competitiveness, prosperity and economic wealth. Scholars have widely acknowledged that human capital is a critical component of firm performance (Bendickson, Muldoon, Liguori & Midgett, 2017; Reed, Lubatkin & Srinivasan, 2006), particularly when it focuses on skills and knowledge and not only on education and training (Unger *et al.* 2011).

In this study we will attempt to measure the importance of human capital as a value creator for the wood sector of Galiza (Spain) and Portugal. While the hypothesis to be tested is whether human capital has a positive correlation with value generation, it was divided into six distinct sections to test different sectors as under:

H1a: Human capital creates value in the extraction sector of Galiza (Spain)

and

H2a: Human capital creates value in the extraction sector of Portugal

The extraction sector in our study comprises of activities of forestry and logging, cork extraction, silviculture, and other related industries. In Portugal, forest ownership is characterized by small property dimensions, elderly and/or absent owners (Martins, Xavier & Fragoso, 2014) and while in Galiza (Spain) the picture is not much different, the property rights of Galizian communal forests are private but collective with the passing of the Galician Act of Communal Forests of 1989 (Caballero, 2015). Nevertheless, the forestry (extraction) sector is still dominated by small and medium enterprises, and even by subsistence small businesses (F-Jardón & Silva, 2017). Intellectual capital is more important as a source of competitive advantage in the case of small and medium enterprises than large companies because the tangible resources are often lower, and SMEs should compete through intangible resources (F-Jardón & Martos, 2012). Human capital is the basic component of intellectual capital (Wang & Chang, 2005) as knowledge resides in people and thus, skilled and trained workers make more efficiently the processes and tasks (F-Jardón & Martos, 2012) even in SMEs. That is why it was essential to segregate the extraction sector in this study. Most of the companies under this sector are SMEs.

H1b: Human capital creates value in the conversion sector of Galiza (Spain)

and

H2b: Human capital creates value in the conversion sector of Portugal

The conversion sector in Galiza (Spain) comprises of construction carpentry, pulp and timber mills, which is mainly dominated by large companies, some of them not listed. In Portugal, it comprises of carpentry activities, pulp and timber mills, but

most of them are SMEs with the prominence of some large companies, specially in the pulp manufacture. In general, the dimension of the companies is larger in Spain. Even though human capital is more important as a source of competitive advantage in the case of small and medium enterprises than large companies because the tangible resources are often lower (F-Jardón & Martos, 2012), it is important to study human capital regardless of the industry type or size because human capital has a greater influence on how a business should be structured in non-service industries (Bontis, Keow & Richardson, 2000). It was necessary to segregate the conversion sector from the other two as it has a mixture of small and medium enterprises with large companies mainly operating in the pulp manufacture. Again, given the diversity of sizes between both countries under study, it was not possible to combine them into one.

H1c: Human capital creates value in the finished products sector of Galiza (Spain)

and

H2c: Human capital creates value in the finished products sector of Portugal

The finished products include every industry that is dependent on wood and that is not part of extraction or conversion, namely paper and its articles, cardboard, wood and its articles, wooden furniture. Both for Spain as well as for Portugal, the sector is characterized by the existence of large multinational companies as well as small players in the unorganized sector, better fitted under the small and medium enterprises. Here too, the prevalence of larger players is seen in Spain with smaller ones in Portugal, mandating us to separate both the countries in this study. Traditional manufacturing sector has a lower investment in human capital as compared to the non-traditional sector (services) and the economic value creation is mainly based on “dead knowledge” embedded in machines (physical capital) (Iazzolino & Laise, 2016). Another remarkable point is that manufacturing companies are intertwined with the environment in which they are embedded, and workers are provided with the necessary technical skills that they can have great difficulty in finding in other places (Barzotto, Corò & Volpe, 2016), thus implying that the segregation of the study into Portugal and Galiza (Spain) had to be done while examining the human capital contribution.

5. METHODOLOGY

Using the data from the SABI database for all the companies in the industries related to the wood and ancillary sector for the financial years 2002-2017, but only considering companies that had financial data for 2016-2017, the human capital and its efficiency were calculated for every company that had positive values (where $VA > HC$), year wise. All outliers (5%) were eliminated to get lesser skewed results. The data was divided country-wise into three main sectors: extraction, conversion and finished products, to facilitate and segregate interpretation.

The model used for this study is as under:

$$VA = \beta_0 + HC \beta_1 + \varepsilon_i$$

TA TA

Where,

VA = Value added TA = Total assets HC = Human capital

Panel data model was used on our study as it possesses several advantages over conventional cross-sectional or time series data sets (Hsiao, 2014), (Anastasiou, 2016):

- More accurate inference of model parameters increasing the degrees of freedom.
- Greater capacity of constructing more realistic behavioral hypotheses, that is not possible using cross-sectional or time series.
- Better control over variables that change over time but not across entities.
- More accurate predictions for individual outcomes by pooling the data rather than generating predictions of individual outcomes using the data on the individual in question.

6. EMPIRICAL ANALYSIS AND FINDINGS

Using a panel data model, we estimated the one-way model random-effects model regression for each one of the constructs above.

SECTOR	INTERCEPT (β_0)			β_1 HC/TA		
	Estimate	Std. Error	z-value	Estimate	Std. Error	z-value
Spain – Extrac- tion sec- tor	0,3335	0,01164	28,638	1,2412	0,0099	124,340
Spain – Con- ver- sion sec- tor	0,1847	0,0039	46,953	1,2131	0,0039	306,354
Spain – Finished products sector	0,1597	0,0038	41,905	1,2632	0,0009	1331,083
Portugal – Extrac- tion sec- tor	0,3376	0,03693	9,142	2,1796	0,01985	109,791
Portugal – Con- ver- sion sector	0,1221	0,0127	9,611	1,4882	0,02984	49,868

Portugal –						
Fin- ished products sector	-0,8079	0,0268	-30,065	4,0266	0,0088	545,649

Based on the results we can see that for:

- In the Spanish extraction sector, the human capital has a significant effect on value generation, and H1a can be accepted.
- In the Spanish conversion sector, the human capital has a significant effect on value generation, and H1b can be accepted.
- In the Spanish finished products sector, the human capital has a significant effect on value generation, and H1c can be accepted.
- In the Portuguese extraction sector, the human capital has a significant effect on value generation, and H2a can be accepted.
- In the Portuguese conversion sector, the human capital has a significant effect on value generation, and H2b can be accepted.
- In the Portuguese finished products sector, the human capital has a significant effect on value generation, and H2c can be accepted.

This implies that overall in the wood sector and related industries of Galiza (Spain) and Portugal, the human capital plays a significant role in creating value, suggesting that for each unit in percentage of investment in human capital in relation to total assets, the added value in relation to total assets in percentage is around 1,2 percent in Spain and between 1,4 and 4,0 percent in Portugal.

Our results match the conclusions found by other authors in several other studies, where the presence of a significant, positive relationship between human capital and business performance was found to exist. However, our study was more exhaustive given the number of company years used. Below the main studies in the area are given and the differences and similarities are highlighted.

- McDowell *et al.* (2018) in the context of SMEs in USA, where the findings were of a significant positive relationship between human capital and organizational capital. They did not focus much on value creation. Our current study was different as it analyzed the effect of human capital on value creation and business performance.
- Andreeva & Garanina (2016) in the case of Russian manufacturing companies found out that human and structural capital positively influenced organizational performance explaining a quarter of its variation, while relational capital did not have any significant influence. This was also not a similar study to

ours, as it measured three components of intellectual capital instead of concentration only on human capital.

- Liepé & Sakalas (2014) using a sample of 26 European Union companies (excepting Luxembourg) and Lithuania studied the human capital investment to the GDP and found out that for every 1 euro invested in human capital, the GDP multiplier was 5,8 times. This study approximates to ours, only differing in the sense that it used companies from different sectors and did not segregate them into countries, ignoring the effect of the local environment on the human capital (Barzotto, Corò & Volpe, 2016). However, the conclusions are the same. The investment in human capital has a positive correlation with value creation.
- Komnenic & Pokrajčić (2012) in their study of Serbian financial, commercial and industrial companies also found out that the relationship between human and structural capital and corporate performance was significant. The results of their study were somewhat like ours, as they also found out that human capital has the greatest significance in the value addition process.
- Maditinos *et al.* (2011) using 96 Greek companies listed in the Athens stock exchange studied the effect of intellectual capital using the VAICTM model. This study is quite different from ours, where we developed a new model to study the value addition of human capital.
- Shih, Chang & Liu (2010) on the banking sector of Taiwan, found out that human capital has a positive and direct influence on structural capital. This analysis is not like ours, where we attempt to measure the value addition of human capital to the business performance.
- Kamath (2008) in the Indian pharmaceutical industry used the VAICTM model and failed to find any significant positive relationship between the firm's performance in terms of productivity, profitability and market valuation. The study used parameters that were different from our study.
- Pew, Plowman & Hancock (2007) on various sectors as per the listing of the Singapore stock exchange also used the VAICTM model and found out positive correlations between the company's intellectual capital and performance. Their study did not focus on human capital specifically and is different from ours.
- Ng (2006) on the Canadian wireless technology companies, studied the effect of structural capital and human capital on future revenue generation, and concluded that human capital did not have such a great effect on the revenue generation as structural capital. This study was based on the correlations between the various components of intellectual capital and did not focus specifically on human capital, being thus different from our study.
- Tseng & Goo (2005) studied a sample of Taiwanese manufacturing companies and the relationships between innovation capital, organizational capital and relational capital on enhancement of corporate value, while human capital is only being studied for its relationships with the other types of capital. The analysis and findings are different from our study and do not match our findings.
- Chen, Cheng & Hwang (2005) on Taiwanese manufacturing companies, used the VAICTM model, and thus their findings are not comparable to our analysis.

- Mavridis (2004) on the Japanese banking sector also used the VAICTM model, and so their findings cannot be compared to our study objective and conclusions.
- Riahi-Belkaoui (2003) on US multinationals studied the combined effect of intellectual capital on value creation without focusing on human capital, and thus, their results are not comparable with ours.

7. CONCLUSIONS, PRACTICAL IMPLICATIONS, LIMITATIONS AND POSSIBLE ADVANCES

7.1. PRACTICAL IMPLICATIONS

Investment in human capital contributes to extensive economic growth. Some of the benefits of investment in human capital are growth of the production, services, quality, labor productivity, decrease in costs, other innovations, high quality relationship with customers, growth of the competitive ability on the market (Kucharčíková, 2014).

This paper proves that the returns of human capital are higher than the investment in value addition, when taken as a ratio to total assets. The recommendations to the wood sector is that investments in human capital should be increased to increase overall the value addition. Our study proved that there is a positive correlation between human capital investment and value creation both for Galiza (Spain) and Portugal. In the case of Spain, one-euro investment in all the three sectors implies an increase in business performance of 1,2 euros. In the case of Portugal, the positive correlation is even higher, ranging between 1,4 euros for the conversion sector, to 2,1 for the extraction sector and around 4,0 for the finished products sector. This can be justified by the argument of F-Jardón & Martos (2012) that intellectual capital is more significant in the case of small and medium enterprises. In Portugal, there was a higher number of SMEs, as compared to Spain.

7.2. LIMITATIONS AND POSSIBLE ADVANCES

Our analysis was limited to the wood and related industries of Galiza (Spain) and Portugal and did not cover other areas of the world. The study could be extended to other economic sectors and other regions of the world in the wood sector too. With an expanded geographical area, the results may differ, especially in the case of SMEs, where the studies are rare.

Similarly, we limited our study to human capital and did not consider the effects of value addition brought about by structural capital and relational capital. These two other types of capital, that together with human capital, compose the intellectual capital, could also be studied to enrich and improve the wood and related industries sector.

REFERENCES

- ANASTASIOU, D., (2016), https://www.researchgate.net/post/what_are_the_advantages_of_panel_data_or_time_series_data
- ANDREEVA, T.; GARANINA, T., (2016), Do all elements of intellectual capital matter for organizational performance? Evidence from Russian context, *Journal of Intellectual*

Capital, vol. 17, no. 2, pp. 397-412.

ANGELSTAM, P.; KAPYLOVA, E.; KORN, H.; LAZDINIS, M.; SAYER, J.; TEPLYA-KOV, V.; TORNBLOM, J., *CHANGING FOREST VALUES IN EUROPE*, IN B.B., SAYER, J.; MAGINNIS, S.; LAURIE, M., (2005), (Ed.), *Forests in landscapes: Eco-system approaches to sustainability*, The Earthscan Forestry Library, London, pp. 59-74.

BARZOTTO, M.; CORÒ, G.; VOLPE, M., (2016), Territorial capital as a company intangible: Exploratory evidence from ten Italian multinational corporations, *Journal of Intellectual Capital*, vol. 17, no. 1, pp. 148-167.

BENDICKSON, J.; MULDOON, J.; LIGUORI, E.; MIDGETT, C., (2017), High performance work systems: A necessity for startups, *Journal of Small Business Strategy*, vol. 27, no. 2, pp. 1-12.

BONTIS, N., (1998), Intellectual capital: an exploratory study that develops measures and models, *Management Decision*, vol. 36, no. 2, pp. 63-76.

BONTIS, N.; KEOW, W.; RICHARDSON, S., (2000), Intellectual capital and business performance in Malaysian industries, *Journal of Intellectual Capital*, vol. 1, no. 1, pp. 85-100.

BOZBURA, F., (2004), Measurement and application of intellectual capital in Turkey, *The Learning Organization*, vol. 11 (4/5), pp. 357-367.

CABALLERO, G., (2015), Community-based forest institutions in the Galician communal forests: A new institutional approach, *Forest Policy and Economics*, vol. 50, pp. 347-356.

CARVALHO-RIBEIRO, S.; LOVETT, A., (2011), Is an attractive forest also considered as well managed? Public preferences for forest cover and stand structure across a rural/urban gradient in northern Portugal, *Forest Policy and Economics*, vol. 13, no. 1, pp. 46-54.

ČESYNIENÉ, R.; STANKEVIČIENÉ, A., (2011), The role of human capital in value creation: Theoretical insights, *Ekonomika*, vol. 90, no. 4, pp. 49- 62.

CHEN, M.; CHENG, S.; HWANG, Y., (2005), An empirical investigation of the relationship between intellectual capital and firm's market value and financial performance, *Journal of Intellectual Capital*, vol. 6, no. 2, pp. 159-176.

COCO, C.; JAMISON, F.; BLACK, H., (2011), Connecting people investments and business outcomes at Lowe's using value linkage analytics to link employee engagement to business performance, *People & Strategy*, vol. 34, pp. 28-33.

EDVINSSON, L.; MALONE, N., (1996), *Intellectual capital: Realizing your company's true value by finding its hidden brainpower*, New York: Harper Business.

F-JARDÓN, C.; MARTOS, M., (2009), Intellectual capital and performance in wood industries of Argentina, *Journal of Intellectual Capital*, vol. 10, no. 4, pp. 600-616.

F-JARDÓN, C.; MARTOS, M., (2012), Intellectual capital as a competitive advantage in emerging clusters in Latin America, *Journal of Intellectual Capital*, vol. 13, no. 4, pp. 462-481.

F-JARDÓN, C.; MARTOS, M., (2014), Intellectual capital and distinctive skills in SMEs of the timber industry in Argentina, *Revista de Administração de Empresas*, vol. 54, no. 6, pp. 1-10.

F-JARDÓN, C.; SILVA, A., (2017), Intellectual capital and environmental concern in subsistence small business, *Management of Environmental Quality*, vol. 28, no. 2, pp. 214-230.

HISRICH, R.; PETERS, M., (2008), *Entrepreneurship*, Singapore: McGrawHill.

HSIAO, C., (2014), *Analysis of panel data*, Cambridge University Press, 3rd edition, New York, New York.

- HITT, M.; DUANE, R., (2002), The essence of strategic leadership: Managing human and social capital, *Journal of Leadership & Organizational Studies*, vol. 9, no. 1, pp. 3-14.
- IAZZOLINO, G.; LAISE, D., (2016), Value creation and sustainability in knowledge-based strategies, *Journal of Intellectual Capital*, vol. 17, no. 3, pp. 457-470.
- KAMATH, G., (2008), Intellectual capital and corporate performance in Indian pharmaceutical industry, *Journal of Intellectual Capital*, vol. 9, no. 4, pp. 684-704.
- KAYA, F.; SAHIN, G.; GURSON, P., (2010), Intellectual capital in organizations, *Problems and Perspectives in Management*, vol. 8, no. 1, pp. 153-160.
- KOMNENIC, B.; POKRAJČIĆ, D., (2012), Intellectual capital and corporate performance of MNCs in Serbia, *Journal of Intellectual Capital*, vol. 13, no. 1, pp. 106-119.
- KUCHARČIKOVÁ, A.; TOKARČIKOVÁ, E.; BLÁŠKOVÁ, M., (2015), Human capital management – Aspect of human capital efficiency in university education, *Procedia – Social and Behavioral Sciences*, vol. 177, pp. 48- 60.
- KUCHARČIKOVÁ, A., (2014), Investment in the human capital as the source of economic growth, *Periodica Polytechnica*, vol. 22, no. 1, pp. 29-35.
- KUJANSIVU, P.; LÖNNQVIST, A., (2007), Investigating the value and efficiency of intellectual capital, *Journal of Intellectual Capital*, vol. 8, no. 2, pp. 272-287.
- LIEPÉ, Z.; SAKALAS, A., (2014), Evaluation of human capital role in the value creation process, *Procedia – Social and Behavioral Sciences*, vol. 156, pp. 78-82.
- LOPES, I.; MARTINS, M., (2006), The new business models in the knowledge economy: The strategic way to value creation, *The Electronic Journal of Knowledge Management*, vol. 4, no. 2, pp. 159-168.
- MADITINOS, D.; CHATZOUDIS, D.; TSAURIDIS, C.; THERIOU, G., (2011), The impact of intellectual capital on firms' market value and financial performance, *Journal of Intellectual Capital*, vol. 12, no. 1, pp. 132-151.
- MAES, J.; SELS, I., (2014), SMEs' radical product innovation: The role of internally and externally oriented knowledge capabilities, *Journal of Small Business Management*, vol. 52, no. 1, pp. 141-163
- MAREY-PEREZ, M.; DIAZ-VARELA, E.; CALVO-GONZALEZ, A., (2014), Does higher owner participation increase conflicts over common land? An analysis of communal forests in Galicia (Spain), *iForest – Biogeosciences and Forestry*, vol. 8, pp. 533-543.
- MARTINS, M.; XAVIER, A.; FRAGOSO, R., (2014), A bioeconomic forestry management model for the Mediterranean forests: A multicriteria approach, *Journal of Multi-Criteria Decision Analysis*, vol. 21, pp. 101- 111.
- MAVRIDIS, D., (2004), The intellectual capital performance of the Japanese banking sector, *Journal of Intellectual Capital*, vol. 5, no. 1, pp. 92-115.
- MCDOWELL, W.; PEAKE, W.; CODER, L.; HARRIS, M., (2018), Building small firm performance through intellectual capital development: Exploring innovation as the "black box", *Journal of Business Research*, vol. 88, pp. 321-327.
- MEMON, M.; MANGI, R.; ROHRA, C., (2009), Human capital as a source of competitive advantage: "Ideas for strategic leadership", *Australian Journal of Basic and Applied Sciences*, vol. 3, no. 4, pp. 4182-4189.
- MOURÃO, P.; MARTINHO, V., (2016), Discussing structural breaks in the Portuguese regulation on forest fires – An economic approach, *Land Use Policy*, vol. 54, pp. 460-478.
- NG, A., (2006), Reporting intellectual capital flow in technology-based companies: Case studies of Canadian wireless technology companies, *Journal of Intellectual Capital*, vol. 7, no. 4, pp. 492-510.
- NOURANI, M.; CHANDRAN, V.; KWEH, Q.; LU, W., (2018), Measuring human, physical and structural capital efficiency performance of insurance companies, *Soc. Indic. Res.*

vol. 138, pp. 281-315. <https://doi.org/10.1007/s11205-017-1584-6>.

OECD (2002), Education policy analysis, <http://www.oecd.org/education/school/educationpolicyanalysis2002edition.htm>

PEW, T.; PLOWMAN, H.; HANCOCK, P., (2007), Intellectual capital and financial returns of companies, *Journal of Intellectual Capital*, vol. 8, no. 1, pp. 76-95.

PULIC, A., (2000), VAICTM – An accounting tool for IC management, *International Journal of Technology Management*, vol. 20, nos. 5-8, pp. 702-714.

PUROHIT, H.; TANDON, K., (2017), Intellectual capital efficiency of Indian firms: An empirical analysis, *The IUP Journal of Knowledge Management*, vol. XV, no. 3, pp. 44-65.

RAHIM, A.; ATAN, R.; KAMALUDDIN, A., (2017), Human capital efficiency and firm performance: An empirical study on Malaysian technology industry, *SHS Web of Conferences*, vol. 36, no. 00026.

REED, K.; LUBATKIN, M.; SRINIVASAN, N., (2006), Proposing and testing an intellectual capital-based view of the firm, *Journal of Management Studies*, vol. 43, no. 4, pp. 867-893.

RIAHI-BELKAOUL, A., (2003), Intellectual capital and firm performance of US multinational firms, *Journal of Intellectual Capital*, vol. 4, no. 2, pp. 215-226.

SAINT-ONGE, H., (1996), Tacit knowledge the key to the strategic alignment of intellectual capital, *Strategy & Leadership*, vol. 24, no. 2, pp. 10-16.

SAYER, J.; MAGINNIS, S., *New challenges for forest management*, in B.B., SAYER, J.; MAGINNIS, S.; LAURIE, M., (2005), (Ed.), *Forests in landscapes: Ecosystem approaches to sustainability*, The Earthscan Forestry Library, London, pp. 1-16.

SARMENTO, E.; DORES, V., (2013), A fileira florestal no contexto da economia nacional: A produtividade e a especialização regional, *Silva Lusitana*, no. Especial, pp. 21-37.

SHIH, K.; CHANG, C.; LIN, B., (2010), Assessing knowledge creation and intellectual capital in banking industry, *Journal of Intellectual Capital*, vol. 11, no. 1, pp. 74-89.

SLEE, B., (2006), The socio-economic evaluation of the impact of forestry on rural development: A regional level analysis, *Forest Policy and Economics*, vol. 8, no. 5, pp. 542-554.

STÄHLE, P.; STÄHLE, S.; AHO, S., (2011), Value added intellectual coefficient (VAIC): A critical analysis, *Journal of Intellectual Capital*, vol. 12, no. 4, pp. 531-551.

STEWART, T., (1991), Brainpower, *Fortune*, no. 3, pp. 44-56.

STEWART, T., (1994), "Your company's most valuable asset: Intellectual capital", *Fortune*, pp. 68-74.

SVEIBY, K., (1998), Intellectual capital: Thinking ahead, *Australian CPA*, June, pp. 18-22.

TSENG, C.; GOO, J., (2005), Intellectual capital and corporate value in an emerging economy: Empirical study of Taiwanese manufacturers, *R & D Management*, vol. 35, no. 2, pp. 187-201.

UNGER, J.; RAUCH, A.; FRESE, M.; ROSENBUCH, N., (2011), Human capital and entrepreneurial success: A meta-analytical review, *Journal of Business Venturing*, vol. 26, no. 3, pp. 341-358.

WANG, W.; CHANG, C., (2005), Intellectual capital and performance in causal models: Evidence from the information technology industry in Taiwan, *Journal of Intellectual Capital*, vol. 6, no. 2, pp. 222-236.

WANG, Z.; WANG, N.; LIANG, H., (2014), Knowledge sharing, intellectual capital and firm performance, *Management Decision*, vol. 52, no. 2, pp. 230-258.

2.º accesit Premio Bernardo Pena Jóvenes Investigadores

XXXIII

CONGRESO INTERNACIONAL
DE ECONOMÍA APLICADA

Asepelt

2019

economía azul

Universidade de Vigo



Asepelt

Asociación Internacional de Economía Aplicada



ECONOMÍA DEL BIEN COMÚN: FUNDAMENTOS Y FUTURAS LÍNEAS DE INVESTIGACIÓN

JOSÉ ANTONIO BELSO MARTÍNEZ

Departamento de Estudios Económicos y Financieros/Universidad Miguel Hernández de Elche Avda. de la Universidad s/n Edif. La Gاليا, 03202
Elche/jbelso@umh.es

MARÍA JOSÉ LÓPEZ SÁNCHEZ

Departamento de Estudios Económicos y Financieros/Universidad Miguel Hernández de Elche Avda. de la Universidad s/n Edif. La Gاليا, 03202
Elche/maria.lopez@umh.es

ISABEL DÍEZ VIAL

Departamento de Organización de Empresas y Marketing/Universidad Complutense de Madrid Campus de Somosaguas, 28223 Pozuelo de Alarcón,
Madrid/diezvial@ccee.ucm.es

email María José López Sánchez: maria.lopez@umh.es

Resumen

Durante los últimos años, la investigación viene prestando creciente atención a modelos alternativos que superan las tradicionales dimensiones puramente económicas (costes, beneficios, etc.). En este marco, la Economía del Bien Común es una propuesta que aboga por una economía basada en valores constitucionales (cooperación, participación, sostenibilidad e igualdad). Esta emergente línea de investigación requiere de una revisión crítica de la literatura. Con el fin de identificar una agenda de investigación, se ha realizado una revisión sistemática de la literatura sobre el bien común durante el periodo 1993-2018 sobre la base de un total de 225 artículos en las subcategorías: “behavioral science”, “business”, “economics”, “geography”, “management”, “planning development” y “urban studies” del Índice de Citas de Ciencias Sociales de Thomson-Reuters (SSCI).

Con el uso de técnicas bibliométricas (análisis de co-citación) y el análisis de redes se evalúa la evolución de las bases teóricas, las principales publicaciones y los autores más relevantes de este campo de investigación. Así mismo, los resultados sugieren futuras líneas de investigación. En primer lugar apuntan hacia la conveniencia de refinar el concepto de bien común. En segundo lugar, parece necesario avanzar en la contrastación empírica y la incorporación de enfoques metodológicos alternativos. En tercer lugar, enfoques longitudinales y comparaciones entre diferentes ámbitos geográficos o sectoriales pueden proporcionar nuevas perspectivas. Por último, los estudios basados en el bien común podrían enriquecerse gracias a la introducción de aportaciones procedentes de otros cuerpos teóricos relacionados.

Palabras clave: Economía del Bien Común, Análisis Bibliométrico, Redes de Co-citación.

Eje Temático 6 : Economía Social, Cooperación y Desarrollo

Abstract

In recent years, research has been paying increasing attention to alternative models that go beyond the traditional purely economic dimensions (costs, benefits, etc.). Within this framework, the Economy of the Common Good is a proposal that advocates an economy based on constitutional values (cooperation, participation, sustainability and equality). This emerging line of research requires a critical review of the literature. In order to identify a research agenda, a systematic review of the literature on the common good during the period 1993-2018 has been carried out on the basis of a total of 225 articles in the subcategories: "behavioral science", "business", "economics", "geography", "management", "planning development" and "urban studies" of the Thomson-Reuters Social Science Quote Index (SSCI).

Using bibliometric techniques (co-citation analysis) and network analysis, the evolution of the theoretical bases, the main publications and the most relevant authors in this field of research are evaluated. Likewise, the results suggest future lines of research. In the first place, they point to the convenience of refining the concept of the common good. Secondly, it seems necessary to advance in empirical contrasting and the incorporation of alternative methodological approaches. Thirdly, longitudinal approaches and comparisons between different geographical or sectoral domains may provide new perspectives. Finally, studies based on the common good could be enriched by the introduction of contributions from other related theoretical bodies.

Key Words: Common Good Economy, Bibliometric Analysis, Co-citation Network.

Thematic Area 6 : Social Economy, Cooperation and Development

1. INTRODUCCIÓN

Desde mitad de los años 80, varios autores han señalado que la ética es una parte integral de la cultura corporativa empresarial demostrando su influencia en el comportamiento ético de las personas que trabajan en las empresas (Sethia y Von Glinow, 1985; Trevino, 1990; Sims, 1992, 2000; Sims y Brinkmann, 2002; Douglas y otros, 2001). Sin embargo, la mayoría de estos estudios sólo consideran la ética como un conjunto de normas de conducta generalmente relacionadas con la integridad para resolver dilemas, enfocados en los casos de mala conducta (p.ej. Enron, Nike y Nestlé) cuando en realidad existe una forma más extensa de entender el concepto de ética (Melé, 2003).

La ética empresarial fue ganando popularidad en el ámbito académico y profesional desde la década de los años 80 (McHugh, 1988; Freeman, 1991; Werhane y Freeman, 1999; De George, 2006) y a partir de entonces se han propuesto diversas teorías para proporcionarle una base teórica sólida. Una de ellas es la ética de la virtud o "virtue ethics", que se considera un enfoque Neo-Aristotélico aplicado a "Business ethics" por autores como DesJardins (1984), Solomon (1992, 1993, 1999, 2004), Koehn (1995, 1998), Walton (2004), Moore (2002, 2005 a, b), Hartman (1998, 2006, 2008a, b) y Weaber, 2006, entre otros. El papel de las virtudes y la vida moral recibió creciente atención por parte de autores influyentes, entre ellos los seguidores del enfoque Aristotélico (Anscombe, 1958; Foot, 1978; MacIntyre, 1985), quienes apuntaban importantes limitaciones en la ética basada en principios abstractos y universales centrada en asuntos éticos y dilemas, dado que éstos ignoraban el carácter de los agentes en el comportamiento ético y los juicios morales (Melé, 2009). Algunos autores, como Solomon reconocieron la necesidad de que la ética basada en la virtud necesitaba algunas correcciones (1992). A partir de este momento se empieza a reclamar una visión más integral de la ética empresarial que centre al individuo dentro de la empresa.

El bien común definido como "la condición general de la vida en sociedad que permite a los diferentes grupos y a sus miembros conseguir su propia perfección de forma más plena y fácil" (Concilio Vaticano Segundo, 1965), implica la cooperación para promover condiciones las cuales amplían la oportunidad para el "floreCIMIENTO" de las personas dentro de una comunidad (relación entre individuos o un grupo social y la sociedad). El concepto de eudaimonia o florecimiento de la humanidad se toma prestado de lo que Aristóteles entendió que era el papel de la polis o comunidad política (Aristotle, Nicomachen Ethics, 1925) donde las comunidades pequeñas deben contribuir al bien común de las grandes comunidades a las que pertenecen (Aristotle, Politics, 1981).

Además de esta tradición Aristotélica y la Aristotélica-Tomística surge posteriormente una nueva escuela del pensamiento conocida como "Capital Social Thought" (or Teaching) (CST) que promueve una visión humanística y "holística" de la vida y la empresa basada en la centralidad del ser humano. Basado en la corriente Aristotélica-Thomística y el CST, el bien común se define como la suma

total de las condiciones sociales que permiten a las personas, bien como grupos o como individuos, alcanzar su realización de forma más plena y fácil (Comisión Pontificia para la Justicia y la Paz, 2004).

Por otro lado, el concepto de bien común aplicado a la empresa, conocido como la teoría del bien común de la empresa, ha sido relacionado de manera difusa y sin atender a una definición concreta, con la teoría de responsabilidad social corporativa (RSC), por autores como Mahon y McGowan (1991) y con el capital social (Spence y Schidpeter, 2003). Otros autores como Jones y Thompson (1984) lo vinculan hacia una orientación específica en las políticas de regulación y toma de decisiones y por último Daly y Cobb (1999) y Atkinson (2004) adoptan una postura en la que el bien común de la empresa tiene que ver con un enfoque multidisciplinar que englobe “business”, “management” y “economics”. Posteriormente Sison y Fontrodona (2012, 2013) evocan a la relación entre bien comunitario y bien personal, definiendo el bien común de la empresa y proclamando la necesidad de un nuevo paradigma de gestión operativa basado en las nuevas premisas antropológicas, políticas, económicas y éticas que el bien común proporciona.

Si bien, la integración del “management” humanista con la ética empresarial ha sido investigada por varios autores (Fontrodona y Sison, 2006; Melé, 2003, 2005, 2009; Whetstone, 2002, 2003) todavía se considera una noción poco desarrollada en la literatura de “business ethics” y de la gestión de recursos humanos (Acevedo, 2012). De acuerdo con Acevedo (2012), cada vez más, encontramos tendencias hacia el “management” humanístico en el enfoque de la cultura organizativa que tratan de abordar cuestiones normativas con la aplicación de valores, como el “value-based management” (Anderson, 1997) o principios de liderazgo (Peus y Frey, 2009).

En este contexto, y más recientemente los investigadores de las ramas de “business ethics” y de “management” reclaman una visión más humanística y “holística” (Melé y otros, 2011; Grassl y Habisch, 2011) que integre la dimensión económica y la humana y que evite considerar la ética como una herramienta, código o conjunto de deberes sino como una dimensión inherente a la acción humana y en consecuencia a la actividad económica (Melé y otros, 2011).

2. DATOS Y METODOLOGÍA

Esta investigación científica consiste en el análisis bibliométrico del concepto “Common Good” ó Bien Común y para ello, hemos usado datos del Índice de Citas de Ciencias Sociales de Thomson-Reuters (SSCI), de la web of science.

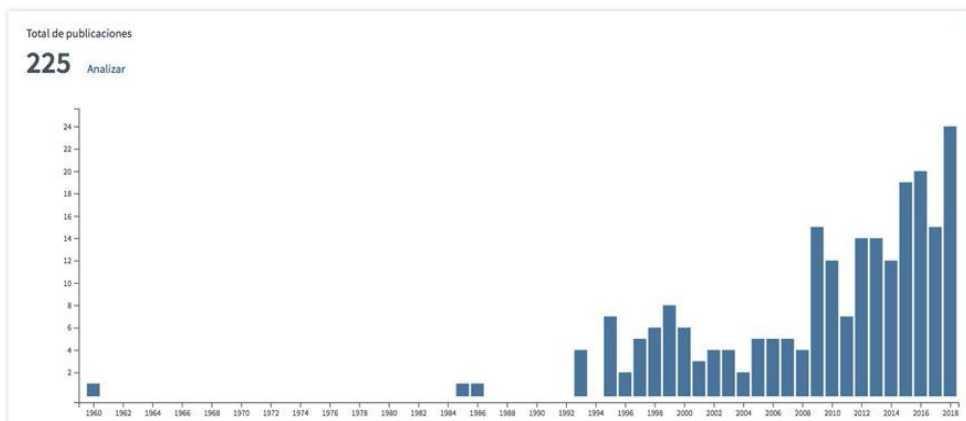
En noviembre de 2018, se comenzó a seleccionar todos los artículos publicados en inglés durante el periodo 1900-2018 bajo el término de búsqueda “Common Good”, y obtuvimos 861 documentos. El siguiente paso fue considerar la búsqueda de publicaciones sólo en ciertas subcategorías de la web of science: “business” (95), “economic” (69), “management” (25), “development studies” (24), “urban studies” (18), “geography” (16). Tras la selección de estas subcategorías la muestra se redujo hasta 225 artículos.

Posteriormente se realizaron dos revisiones independientes de los resúmenes para descartar aquellos documentos que a pesar de que se utilizaron los términos de búsqueda, utilizaban el concepto del bien común sin hacer referencia a lo

ampliamente conocido como economía del bien común. Tras esta clasificación, la muestra final quedó compuesta por un total de 194 artículos.

El número de publicaciones sobre el bien común ha crecido considerablemente desde 1993, antes de este año se encuentran pocos estudios, lo que explica por qué este estudio arranca a partir de ese año. Las técnicas bibliográficas permiten identificar tendencias, bases teóricas o grupos de artículos basados en las similitudes de los artículos citados. Como los hábitos de citación cambian con el tiempo, estas técnicas funcionan mejor dentro de un marco de tiempo limitado, por lo que es razonable dividir la muestra en subperíodos, como se ha hecho en estudios anteriores (Ramos-Rodríguez y Ruíz-Navarro, 2004; Ronda-Pupo y Guerras-Martín, 2010; Vogel, 2012). En este caso, la muestra se divide en dos períodos de 15 y 11 años cada uno pero como veremos más adelante, sólo a efectos de un análisis descriptivo. En concreto, el primer subperíodo va del 1993 al 2007 y el segundo de 2008 a 2018.

En la Figura 1 observamos que desde 2008, el número de publicaciones ha crecido considerablemente y antes de este año se encuentran pocos trabajos. En particular, el primer subperíodo, de 1993 al 2007, cuenta con 62 documentos escritos por 79 autores publicados en 39 revistas diferentes, en el que las líneas de investigación referentes al bien común comienzan a desarrollarse. En el segundo subperíodo, del 2008 al 2018, se publicaron 132 documentos en 62 revistas, escritos por 214 autores observándose una clara consolidación como línea de investigación.



Fuente: Elaboración de autores a partir de la base de datos SSCI.

Figura 1. Número de publicaciones de las subcategorías seleccionadas de Common Good.

La Tabla 1 muestra las 10 mejores revistas editoriales en cada período de estudio. En el primer subperíodo éstas, fueron citadas en 33 ocasiones, lo que representa el 53,23% del número total de citas de las 62 revistas citadas en este período. El mismo número de revistas en 2010-2018 fueron citadas en 76 artículos, lo que representa un porcentaje similar, el 57,58%, del número total de citas de las

132 revistas citadas en este período de tiempo. Como vemos, en ambos periodos la revista *Journal of Business Ethics* lidera la tabla a amplia distancia de las revistas que ocupan las siguientes posiciones.

Tabla 1: Lista de las mejores revistas por periodo de tiempo

PERÍODO 1993 – 2007

ARTICLES	JOURNALS
15	Journal Of Business Ethics
3	Ecological Economics
3	Futures
2	International Journal Of Social Economics
2	World Development
2	Review Of Social Economy
2	Public Relations Review
2	American Journal Of Economics And Sociology
1	Public Management Review
1	Public Administration And Development

PERÍODO 2008 – 2018

ARTICLES	JOURNALS
44	Journal Of Business Ethics
8	Business Ethics Quarterly
5	Business Ethics-A European Review
5	American Journal Of Economics And Sociology
4	Journal Of Economic Issues
2	Community Development Journal
2	Leadership Quarterly
2	Planning Theory & Practice
2	Third World Quarterly
2	Futures

Fuente: Elaboración de autores a partir de la base de datos SSCI.

Tabla 2: Los principales difusores. Revistas más citadas por periodo de tiempo

PERÍODO 1993 – 2007

ARTICLES	JOURNALS
22	Acad Manage Rev
13	J Pers Soc Psychol
12	Harvard Bus Rev
10	Am J Sociol
9	J Plan Educ Res
8	Am Econ Rev
8	Organ Sci
7	Admin Sci Quart
7	Presidential Studies
7	Rural Sociol

PERÍODO 2008 – 2018

ARTICLES	JOURNALS
264	J Bus Ethics
114	Bus Ethics Q
95	Acad Manage Rev
81	Business Ethics Q
34	Harvard Bus Rev
26	Organ Stud
22	Business Ethics Euro
22	J Plan Educ Res
18	Am Econ Rev
17	J Pers Soc Psychol

Fuente: Elaboración de autores a partir de la base de datos SSCI.

Las 10 revistas más citadas y por lo tanto las que ejercen el papel de principales difusoras quedan recogidas en la Tabla 2. En el periodo 1993-2007, estas revistas

fueron citadas en 103 ocasiones, representando el 16,80% del total de referencias citadas (613), mientras que como se observa en el período 2010-2018, las 10 principales revistas fueron citadas en 693 artículos, representando el 50,80% de referencias totales (11.364) en este segundo período.

Por último la Tabla 3 recoge los artículos más citados para cada periodo de tiempo y la Tabla 4 los diez principales autores. Es fácil comprobar que en ambos periodos se encuentra Aristóteles en la lista. En el primer periodo ocupa la sexta posición, mientras que en el siguiente periodo ocupa la segunda, debido al importante papel de la ética de la virtud, como enfoque Neo-Aristotélico, para dar una base teórica sólida a la ética empresarial o business ethics. Por otro lado llama la atención que en el segundo periodo aparece como sexto autor más citado el Papa Juan Pablo II, dada la relevancia del enfoque o escuela de pensamiento "Social Catholic Teaching" aplicada en los últimos años al bien común y a la ética empresarial.

Tabla 3: Los principales difusores. Artículos más citados por periodo.

PERÍODO 1993 - 2007

AUTHORS	YEAR	JOURNAL	TOTAL CITATIONS
Putnam R	1993	Making Democracy Wor	5
Coleman J	1998	Am J Sociol	4
Olson M	1965	Logic Collective Act	4
Rawls J	1971	Theory Justice	4
Portes A	1998	Annu Rev Sociol	3
Granovetter M	1973	Am J Sociol	3
Woolcock M	1998	Theor Soc	3
Adler P	2002	Acad Manage Rev	3
Jensen M	1976	J Financ Econ	3
Donaldson T	1995	Acad Manage Rev	3

PERÍODO 2008 - 2018

AUTHORS	YEAR	JOURNAL	TOTAL CITATIONS
Sison A	2012	Bus Ethics Q	18
Mele D	2009	J Bus Ethics	17
Aristotle	1925	Nicomachean Ethics	16
Argandona A	1998	J Bus Ethics	13
Moore G	2005	Bus Ethics Q	10
O'Brien T	2009	J Bus Ethics	10
Donaldson T	1995	Acad Manage Rev	9

Moore G	2005	Bus Ethics Q	9
Solomon R	1992	Bus Ethics Q	9
Jensen M	1976	J Financ Econ	8

Fuente: Elaboración de autores a partir de la base de datos SSCI.

Tabla 4: Autores más citados.

PERÍODO 1993 - 2007

PERÍODO 2008 - 2018

NUMBER OF CITATIONS	AUTHORS
13	Freeman R
13	Friedman M
11	Putnam R
11	Smith A
10	Lazega E
9	Mele D
9	Aristotle
9	Coleman J
8	Bourdieu P
8	Weber M

NUMBER OF CITATIONS	AUTHORS
61	Mele D
47	Aristotle
47	MacIntyre A
47	Moore G
40	Sison AJG
29	John Paul II
19	Argandona A
18	Maritain J
18	Donaldson T
16	Hartman EM

Fuente: Elaboración de autores a partir de la base de datos SSCI.

2.1 ANALISIS DE COCITACIÓN

Al conjunto de datos se aplicó el análisis de cocitación, que se centra en las referencias o “cited documents”, considerándolos más relacionados o similares cuanto más a menudo se citan juntos. Esta técnica se utiliza para identificar la base de conocimientos del campo y la estructura intelectual de la investigación existente (Zupic y Cater, 2015).

En el análisis de cocitación la base de datos de los documentos citados debe ser revisada y refinada para identificar la relación de los artículos (Díez-Vial y Montoro-Sánchez, 2017). Los 194 artículos de la muestra, incluían referencias citadas que debían ser homogeneizadas, lo que permitía refinar aún más nuestra selección. Al hacerlo, se revisó el nombre de las revistas, ya que muchas de ellas utilizaban diferentes abreviaturas, se eliminó el segundo apellido de los autores y se convirtieron los títulos y nombres de los autores en minúsculas.

Una vez revisados los “cited documents”, concluimos con 501 artículos en 1993-2007 que fueron citados en 572 ocasiones, de los cuales 450 sólo se citaron una vez, y otros 501 artículos en el segundo período citados en 1327 veces, de los que 39 sólo habían sido citados en una ocasión. Al realizar el análisis de cocitación por

periodos, en el segundo periodo encontramos 28 artículos con más de 5 citas, contando el artículo más citado con 18 citas, mientras que en el primer periodo tan sólo 5 artículos son citados con una frecuencia mayor de 3, teniendo 5 citas el artículo más citado. Tras estas observaciones de los datos y comprobaciones con el número de mínima frecuencia, se llegó a la conclusión de que según el gráfico de sedimentación lo más conveniente era considerar para el análisis, un único periodo de tiempo (de 1993 a 2018). Por lo que tras juntar los 194 documentos y sacar la matriz de cocitation y considerando sólo aquellos artículos con una frecuencia mínima de 9 citas, la muestra final finalmente contempla 26 artículos (citing references).

3. RESULTADOS Y DISCUSIÓN

Para facilitar el análisis bibliométrico de la literatura científica utilizamos el software BibExcel. Este software toma datos bibliográficos de la Web of Knowledge y realiza cálculos bibliométricos basados en matrices de similitudes entre los documentos citados para el análisis de cocitación.

Para normalizar la medida de relación basada en el recuento del número de cocitas entre los documentos citados o las referencias, utilizamos la similitud del coseno de Salton (Salton y McGill 1983). Esto nos permitió normalizar la matriz para cada periodo de tiempo y utilizando el análisis factorial realizado en SPSS 22.0 identificamos los subcampos o factores. Se utilizó el análisis factorial exploratorio con análisis de componentes principales como método de extracción que requiere especificar el número de factores por adelantado.

En este estudio se utilizó la regla de parada de Kaiser, basada en la elección del número de factores con un valor propio superior a 1, pero como produjo demasiados factores, se utilizó el gráfico de pantalla, que representa la relación entre la magnitud relativa de los valores propios y el número de factores, eligiendo el número de factores hasta el punto de transición (Bryant y otros, 1995). Este criterio se combinó con la evaluación de la varianza total explicada y los factores resultantes, evitando los de baja contribución. Para ajustar (o cargar) el número máximo de referencias en el número mínimo de factores, utilizamos la rotación varimax.

Las cargas factoriales representan la correlación entre una referencia dada y el factor. Las referencias con una carga superior a 0,7 se consideran una contribución fundamental al factor, por lo que les prestamos especial atención y las referencias con cargas inferiores a 0,4 son pobres, por lo que no las hemos tenido en cuenta. Se consideraron las referencias a más de un factor, considerándose éstas en todos los factores, pero ponderando su contribución al factor de carga de la referencia en cada factor.

FACTORES

ARTÍCULOS	1	2	3	4	5	6	7	8
Arjoon S; Turriago-Hoyos A; Thoene U 2018	,890		,154				,105	

Mele D 2009	,836							
Sison AJG; Fontrodona J 2012	,767							
McPherson D 2013	,747		,580				,104	
Fernando M; Moore G 2015	,527	-,107	-,141	-,185	-,188	-,274	,372	,194
Signori S; Rusconi G 2009	-,121	,955					,127	
Fremaux S; Michelson G 2017	-,121	,955					,127	
Acevedo A 2012	,413	,736						
Bernacchio C; Couch R 2015	-,109		,943					
Garcia-Ruiz P; Rodriguez-Lluesma C 2014	,515		,724				,159	
Mele D 2003				,908			,127	
Cots EG 2011				,884			,159	
Maak T 2007					,897		,128	
Mele D 2012					,871		,161	
Costa E; Ramus T 2012	-,109					,853	,128	
Arnaud S; Wasieleski DM 2014						,798	,254	,104
Sison AJG; Ferrero I 2015		-,273	-,251	-,310	-,315		,529	,292
Nayak A 2016							,147	-,900

Figura 2: Referencias y cargas factoriales

Tras realizar el análisis factorial, el estudio se centra sólo en las 18 referencias que tienen valor de carga superior a 0.4, por lo tanto 8 artículos no cargaron a ningún factor. Los autores trabajaron independientemente para caracterizar los factores y luego juntos para encontrar las caracterizaciones más satisfactorias. Como se muestra en la Figura 2, se identificaron ocho factores para el total del periodo

analizado y en ella aparecen únicamente las 18 referencias que son relevantes para explicar estos factores. El estudio de estos factores o grupo de referencias permitirá comprender la evolución de los fundamentos teóricos. Los factores identificados y que se numeran del 1 al 8 en la Figura 2, se denominaron de la siguiente manera: Factor 1: Fundamentos Teóricos; Factor 2: Empresas y Contribución; Factor 3: Agentes y Gobernanza; Factor 4: Liderazgo y Humanismo; Factor 5: Capital Social e Interacciones; Factor 6: Responsabilidad Social Corporativa y Management; Factor 7: Empíricos emergentes y Factor 8: Ética y Toma de Decisiones.

A continuación se discuten los subcampos ó líneas de conocimiento que conforman la base del conocimiento de la economía del bien común.

Los Fundamentos Teóricos del Bien común

Al factor denominado como fundamentos teóricos del bien común, cargan cinco artículos que desarrollan el enfoque Aristotélico de la ética de la virtud aplicada a la ética empresarial, basado en los rasgos del carácter, y su evolución desde la tradición Neo-Aristotélica, la Thomística-Aristotélica, el “Catholic Social Teaching” (CST) y el enfoque de Aladais MacIntyre. Con el tiempo se empieza a reclamar una visión más integral de la ética empresarial que centre al individuo dentro de la empresa. En este intento (Melé, 2009) propone integrar el personalismo, reconocido como un fundamento filosófico de la economía (Bouckaert, 1999; Zúñiga, 2001; Finn 2003; Grabill 2003; O’Boyle, 2003), en la ética basada en la virtud y propone la integración de dos principios con implicaciones importantes para la ética empresarial. Por un lado el principio personalista que hace explícito el deber del respeto, benevolencia y cuidado por las personas (relación interpersonal) y por otro, el principio del bien común que se refiere a “la condición general de la vida en sociedad que permite a los diferentes grupos y a sus miembros conseguir su propia perfección de forma más plena y fácil” (Concilio Vaticano Segundo, 1965) y que implica la cooperación para promover condiciones las cuales amplían la oportunidad para el “florecimiento” de las personas dentro de una comunidad (relación entre individuos o un grupo social y la sociedad).

Recientemente se ha desarrollado un nuevo enfoque dentro de la ética basada en la virtud aplicada a “business ethics” propuesto por McPherson (2013) y que se conoce como “vocational virtue ethics” o ética de la virtud profesional. Este autor argumenta que para que realmente el enfoque de la ética basada en la virtud se pueda aplicar al ámbito empresarial se deben cumplir dos condiciones, por un lado que las virtudes deben ser ejercidas por el bien de la vida de cada uno, como un todo unitario (enfoque contra rol-moralidad) y en segundo lugar, las virtudes también deben ser puestas en práctica por el bien de la comunidad de la que se pertenece así como también por el bien individual de sus miembros (enfoque contra-egoísta). Ambos criterios pueden converger si se consigue transformar la naturaleza del trabajo, entendiendo éste como la antigua noción de vocación o profesión a perseguir a través de la práctica de las virtudes y la “buena vida” (concepto Aristotélico) tanto para nosotros como para los demás. Interesante también su visión más amplia del enfoque Aristotélico de la virtud basada en la virtud puesto que considera que la realización de nuestros propósitos (relacionados con la racionalidad y socialización) se consigue no sólo a través de la práctica de virtudes de carácter, como hasta ahora argumentaba

este enfoque, sino también con las del intelecto y además debe considerar otras cuestiones tan valiosas como el respeto, preocupación o amor por el bien de otros seres humanos, la naturaleza y para los teístas, Dios.

El trabajo de Alasdair MacIntyre "After virtue" (1985) juega un papel esencial al reavivar en los últimos años el interés de la ética basada en la virtud Aristotélica y como crítica avanzada de la economía capitalista. En este sentido, los artículos de David McPherson de (2013) y de Fernando y Moore (2015) que cargan a este primer factor, aplican este marco conceptual.

Las Empresas y su Contribución al Bien Común

Por otro lado, tres artículos cargan al factor empresas y su contribución al bien común. Antes de comentar estos trabajos conviene resaltar que Sison y Fontrodona (2012, 2013) definen el bien común de la empresa como el trabajo en común que permite a los seres humanos producir no sólo bienes y servicios (conocida como la dimensión objetiva) sino de forma más importante, desarrollar habilidades técnicas o artísticas y virtudes morales e intelectuales (dimensión subjetiva). Ambos autores señalan la necesidad de un nuevo paradigma de gestión operativa basado en las nuevas premisas antropológicas, políticas, económicas y éticas que el bien común proporciona y que inevitablemente plantea nuevos retos a otras teorías de la empresa más establecidas como la neoclásica y la institucional, en las que la asunción del individualismo y el entendimiento de los bienes como mera preferencia-satisfacción serán claramente cuestionados.

Signori y Rusconi (2009) argumentan que la forma de gestionar las empresas requiere de un enfoque que maximice el bienestar de todos los "stakeholders" no sólo de los "shareholders". Por otro lado, Fremeaux y Michelson (2017) analizan dos movimientos surgidos recientemente bajo el enfoque del "humanistic management", el "conscious capitalism" y "economy of communion". Por último, Acevedo (2012) trata la integración del personalismo y el humanismo en la ética empresarial. Esta visión personalista de la ética empresarial desarrollada en el artículo de Acevedo, hace de punto de convergencia con los artículos anteriores.

Los Agentes y la Gobernanza del Bien Común

Al factor agentes y gobernanza cargan tres artículos cuyo punto en común versa en la aplicación del marco conceptual MacIntyre para investigar la aplicación de la ética de la virtud a la ética empresarial, y en concreto aplicado a la gobernanza participativa de los empleados (Bernacchio y Couch, 2015), al consumo ético (García-Ruiz y Rodríguez-LLuesma, 2014) y al trabajo, desarrollando el enfoque de vocational virtue ethics, (McPherson, 2013). Como se puede comprobar, este último trabajo también carga al primer factor.

Liderazgo y Humanismo en el Bien Común

El cuarto subcampo de conocimiento denominado liderazgo y humanismo hace referencia a que dentro de la perspectiva más humanista y holística de considerar la empresa como una comunidad de personas, surge un cambio de paradigma en las teorías de liderazgo. Para entender cómo los líderes contribuyen al mundo que les rodea, los investigadores han usado diferentes conceptos y han desarrollado teorías, entre ellas "business ethics" (Treviño, 1986), espiritualidad en el trabajo (Mitroff y Denton, 1999; Ashmos y Duchon, 2000), "positive organizational scholarship" (Cameron y otros, 2003), "appreciate inquiry" (Cooperrider y Whitney, 1998) y responsabilidad social corporativa (Carroll, 1999). Karakas y

Sarigollu (2010) identifican cuatro corrientes del bien común en la investigación empresarial. Una de ellas es el paradigma de la moralidad en el que se basa en la literatura de "business ethics", valores y ética del liderazgo y toma de decisiones éticas. De los dos trabajos de la muestra que cargan a este factor, Garriga (2011) presenta el capital social de los "stakeholders" como un nuevo enfoque dentro de las teorías de gestión de "stakeholders" y Melé (2003) aplica la tradición aristotélica y humanista para definir las características de debiera tener las culturas organizativas para que contribuyan a generar capital social.

Capital Social e Interacciones del Bien Común

Dos trabajos cargan al factor capital social e interacciones. Por un lado, Maak (2007) expone cómo el liderazgo responsable puede contribuir a generar capital social y por otro, Melé (2012) plantea una teoría de capital social de la empresa, considerando ésta como una comunidad de personas o "human community ethos", en contraposición de la neoclásica, basada en las preferencias y satisfacción del propio individuo, el "ego" y "yo". Volviendo a Maak (2007) éste considera que la ética se encuentra en el núcleo del liderazgo y reclama una teoría para el liderazgo responsable. Enlaza el concepto de liderazgo responsable con el capital social argumentando que a través de la creación de redes de valor de diversos "stakeholders" que aumentan el capital social, el liderazgo responsable contribuye la sostenibilidad empresarial y al bien común. En la misma línea otros autores como Schotter y Tsoukas (2014) utilizan el concepto aristotélico "phronesis" o prudencia o también conocido como conocimiento práctico para hablar de un "phronetic leader" como aquel que en la búsqueda de salir de sus dificultades, ha desarrollado una capacidad refinada para captar intuitivamente las características de situaciones ambiguas y constituir un panorama de posibles vías de respuesta, mientras se siente impulsado a la búsqueda de la noción del bien común.

Responsabilidad Social Corporativa y Management del bien común

Otra de las corrientes del bien común identificadas por Karakas y Sarigollu (2010) en la investigación empresarial es la corriente comunitaria basada en la literatura sobre responsabilidad social corporativa (RSC) que se enfoca en la contribución de los líderes en la sociedad y el servicio comunitario. En esta línea, el papel de la empresa al abordar problemas sociales y medioambientales ha sido ampliamente discutido en la literatura sobre RSC (Garriga y Melé, 2004; Jamali, 2008). Enfoques como "stakeholder democracy" (Freeman, 1984; Matten y Crane, 2005, Moriarty, 2014), "corporate citizenship" (Moon, Crane y Matten, 2005) y RSC político (Scherer y Palazzo, 2007; Scherer y otros, 2014) han defendido un conjunto más amplio de responsabilidades de la empresa de cara a la sociedad. De hecho existe un creciente interés por las cuestiones de gobernanza social y medioambiental en las inversiones y a la hora de integrar estas cuestiones en la creación de valores de la empresa estando a mayor distancia todavía los retos humanitarios (Maak, 2007). Dentro del enfoque de RSC político, Goodman y otros (2015) argumentan que el enfoque "social shareholder engagement" (SSE) identifica un papel político para los "shareholders" en la consecución del bien común ya que puede promover un cambio normativo/obligatorio para garantizar la voz marginada de ciertos "stakeholders" en decisiones empresariales en las que se ven afectados. Autores como Arnaud y Wasieleski (2014) argumentan que cuestiones sobre

cómo los managers deberían ejercer su poder de discreción para gestionar las relaciones intra-empresariales de los “stakeholders” para conseguir objetivos de RSC han sido poco exploradas en la literatura. Al factor responsabilidad social corporativa y management del bien común cargan dos artículos relacionados con la gestión humanística y el bien común. El trabajo de Costa y Ramus (2012) desde la perspectiva de la corriente “Catholic Social Teaching” y el de Arnaud y Wasieleski (2014) desde el enfoque “corporate citizenship” dentro de la línea de responsabilidad social corporativa.

Empíricos Emergentes del Bien Común

En cuanto a la séptima línea de investigación, empíricos emergentes del bien común, Ferrero y Sison (2014), concluyen que en los últimos 30 años los estudios empíricos y cuantitativos sobre la ética basada en la virtud se convertirán en el principal tema de investigación desde el cambio de milenio. Recientemente estos mismos autores (Sison y Ferreo, 2015) trazan una clara línea entre la “clásical virtue” y la “positive virtuousness”. La mayoría de la literatura sobre virtuosismo se ha enfocado a la empresa, y con el fin de abordar la falta de alineación y disonancia entre los conceptos de virtuosismo y bien común y su fin por alcanzar “eudamonia”, recientemente Arjoon y Turriago-Hoyos (2018) han desarrollado un marco conceptual conocido como “virtuousness-common good” para explorar las bases de la armonización de los objetivos de los individuos, la empresa y la economía. Como se observa en la Figura 2 el artículo de Fernando y Moore (2015) del primer factor, también carga a este factor aunque no llega a alcanzar el mínimo considerado (0,4).

Ética y Toma de Decisiones

Al último subcampo de conocimiento del bien común, ética y toma de decisiones, sólo carga el trabajo de Nayak (2016) que considera la noción de la sabiduría no en su acepción frecuente, hacer lo correcto en correctas circunstancias para conseguir el bien común, sino asociarlo a toma de decisiones en circunstancias trágicas o situaciones sin salida. Y relaciones conceptos como decisiones morales, ética, emociones, virtud y sabiduría.

4. CONCLUSIÓN

Los resultados del análisis bibliométrico apuntan en primer lugar, hacia la conveniencia de refinar el concepto de bien común a tres niveles, economía, organización e individuo. En segundo lugar, e identificadas las líneas de investigación que conforman la estructura intelectual de la economía de bien común, parece necesario avanzar en la contrastación empírica y la incorporación de enfoques metodológicos alternativos relacionados con la corriente positiva. En tercer lugar, enfoques longitudinales y comparaciones entre diferentes ámbitos geográficos o sectoriales pueden proporcionar nuevas perspectivas. Por último, los estudios basados en el bien común podrían enriquecerse gracias a la introducción de aportaciones procedentes de otros cuerpos teóricos relacionados.

REFERENCIAS

ACEVEDO, A. (2012): Personalist Business Ethics and Humanism Management: Insight from Jacques Maritain. *Journal of Business Ethics* 105, 197–219. DOI 10.1007/s10551-011-0959- x

- ANDERSON, C. (1997). Values-based management. *Academy of Management Executive*, 11(4), 25–46.
- ANSCOMBE, E. (1958): Modern Moral Philosophy. *Philosophy*, 33, 1–19. Reproducido en ARISTOTLE (1925): *The Nicomachean Ethics*, trans. D. Ross. Oxford University Press, Oxford/New York, Reeditado en 1980.
- ARISTOTLE (1948): *The Politics*, trans. E. Barker. Oxford University Press, Oxford.
- ARJOON, S.; TURRIAGO-HOYOS, A.; THOENE, U. (2018): Virtuousness and the Common Good as a Conceptual Framework for Harmonizing the Goals of the Individual, Organizations and the Economy. *Journal of Business Ethics*, 147, 143–163. <https://doi.org/10.1007/s10551-015-2969-6>.
- ARNAUD, S.; WASIELESKI, D.M. (2014): Corporate Humanistic Responsibility. Social Performance through Managerial Discretion of the HRM. *Journal of Business Ethics*, 120, 313–334. DOI 10.1007/s10551-013-1652-z
- ASHMOS, D.P.; DUCHON, D. (2000): 'Spirituality at work: A conceptualization and measure', *Journal of Management Inquiry*, 9, 134–145.
- ATKINSON, R. (2004): Connecting business ethics and legal ethics for the common good: come, let us reason together. *Journal of Corporation Law*, 29, 470–531.
- BERNACCHIO, C.; COUCH R. (2015). The virtue of participatory governance: a MacIntyrean alternative to shareholder maximization. *Business Ethics: A European Review*, 24 (S2), 130-143.
- BOUCKAERT, L. (1999): The project of a personalistic economics. *Ethical Perspectives*, 6(1), 20–33.
- BRYAN, F.B; TARNOLD, P.R.; GRIMM, L.G. (1995): Principal-components analysis and exploratory and confirmatory factor analysis. En BRYAN, F.B.; YARNOLD P.R.; GRIMM, L. G. (eds): *Reading and understanding multivariate statistics*, 99-136. American Psychology Association. Washington.
- CAMERON, K. S.; DUTTON, J. E.; QUINN R. E. (Eds.) (2003): Positive Organizational Scholarship: Foundations of a new Discipline. Berrett-Koehler. San Francisco
- COMISION PONTIFICIA PARA LA JUSTICIA y LA PAZ (2004): *Compendium of the social doctrine of the church*. Vatican City. Libreria Editrice.
- CONCILIO VATICANO SEGUNDO (1965/1966). *Gaudium et spes*. Acta Apostolicae Sedis, 58, 1025–1115.
- COOPERRIDER D. L.; WHITNEY, D. (1998): *Appreciative Inquiry: A Constructive Approach to Organization Development and Social Change*. Lakeshore Publishing, Cleveland, OH.
- COSTA, E.; RAMUS, T. (2011): The Italian Economia Aziendale and Catholic Social Teaching: How to Apply to Common Good Principle at the managerial Level. *Journal of Business Ethics*, 106, 103-116. DOI 10.1007/s10551-011-1056-x
- DALY, H. E.; COBB, J. B., Jr. (1999). For the common good. *Journal of Business Administration & Policy Analysis*, 27–29.
- DE GEORGE, R. T. (2006): The History of Business Ethics. En EPSTEIN M. J.; HANSON, K. O. (eds.): *The Accountable Corporation*. Vol. 2, 47–58. Business Ethics, Praeger Westpoint, CO/London.
- DESJARDINS, J. (1984): Virtues and Business Ethics. En HOFFMAN, W. M.; MOORE, J. M.;
- DIEZ-VIAL, I.; MONTORO-SANCHEZ, A. (2017): Research evolution in science parks and incubators: foundations and new trends. *Scientometrics*, 110, 1243-1272. Doi: 10.1007/s11192-016-2218-5.
- FOOT, P. (1978): *Virtues and Vices and Others Essays in Moral Philosophy*. University of

California Press, Berkeley and Los Angeles.

FREDO D. A. (eds.): *Corporate Governance and Institutionalizing Ethics*. D.C.Health, Lexington.

FREMEAUX, S.; MICHELSON, G. (2015): The Common Good of the Firm and Humanistic management: Conscious Capitalism and Economy of Communion. *Journal of Business Ethics*, 145, 701-709. DOI 10.1007/s10551-016-3118-6

DOUGLAS, P. C.; DAVIDSON, R. A.; SCHWARTZ, B. N. (2001): The Effect of Organizational Culture and Ethical Orientation on Accountants' Ethical Judgments. *Journal of Business Ethics*, 34, 101-121.

FERNANDO, M.; MOORE, G. (2014). MacIntyre Virtue Ethics in Business: A Cross-Cultural Comparison. *Journal of Business Ethics*, 132, 185-202. DOI 10.1007/s10551-014-2313-6

FERRERO, I.; SISON, A.J.G. (2014): A quantitative analysis of authors, schools and themes in virtue ethics articles in business ethics and management journals (1980-2011). *Business Ethics: A European Review*, 23 (4) 375-400.

FINN, D. R. (2003). The foundations of economic personalism: Promise and peril. *Journal of Markets & Morality*, 6(2), 599-615.

FONTRODONA, J.; SISON, A. (2006): The nature of the firm, agency theory and shareholder theory: A critique from philosophical anthropology. *Journal of Business Ethics*, 66(1), 33-42.

FREEMAN, R. E. (1984): *Strategic management: A stakeholder approach*. Pitman. Boston.

FREEMAN, R. E. (1991): *Business Ethics: The State of the Art*. Oxford University Press, New York.

GARCÍA-RUIZ, P.; RODRIGUEZ-LLUESMA, C. (2014): Consumption Practices: A Virtue Ethics Approach. *Business Ethics Quarterly* 24(4), 509-531. DOI: 10.5840/beq20147313

GARRIGA E.; MELE, D. (2004): Corporate social responsibility theories: Mapping the Territory. *Journal of Business Ethics*, 53 (1-2), 5-71.

GARRIGA, E. Stakeholder Social Capital: A new approach to Stakeholder Theory. *A European Review*, 20(4), 328-341.

GRABILL, S. J. (2003): Introduction to economic personalism. *Journal of Markets & Morality*, 6(2), 597-598.

GRASSL, W.; HABISCH, A. (2011): Ethics and economics: Towards a new humanistic synthesis for business. *Journal of Business Ethics*, 99(1), 37-49.

HARTMAN, E. M. (1998): The Role of Character in Business Ethics. *Business Ethics Quarterly*, 8(3), 547-559.

HARTMAN, E. M. (2006): Can we Teach Character? An Aristotelian Answer. *Academy of Management Learning & Education* 5(1), 68-81.

HARTMAN, E. M. (2008a): Socratic Questions and Aristotelian Answers: A Virtue-Based Approach to Business Ethics. *Journal of Business Ethics*. 78(3), 313-328.

HARTMAN, E. M. (2008b): Reconciliation in Business Ethics: Some Advice from Aristotle. *Business Ethics Quarterly*, 18(2), 253-265.

JAMALI, D. (2008): A stakeholder approach to corporate social responsibility: A fresh perspective into theory and practice. *Journal of Business Ethics*, 82, 213 - 231.

KARAKAS, F.; SARIGOLLU, E; (2010): Benevolent Leadership: Conceptualization and Construct Development. *Journal of Business Ethics*. 108(4), 537-55. DOI: 10.1007/s10551-011-1109-1

KOEHN, D. (1995): A Role for Virtue Ethics in the Analysis of Business Practice. *Business Ethics Quarterly*, 5(3), 533-539.

KOEHN, D. (1998): Virtue Ethics, the Firm, and Moral Psychology. *Business Ethics Quar-*

terly, 8(3), 497–513.

MAAK, T. (2007): Responsible Leadership, Stakeholder Engagement and the Emergence of Social Capital. *Journal of Business Ethics*, 74, 329–343. DOI 10.1007/s10551-007-9510-5

MACINTYRE, A. (1985): *After Virtue. A Study in Moral Theory*. 2nd Edition. Duckworth, London.

MAHON, J. F.; MCGOWAN, R. A. (1991): Searching for the common good: A process-oriented approach. *Business Horizons*, 34(4), 79–86.

MATTEN, D.; CRANE, A. (2005): What is stakeholder democracy? Perspectives and issues. *Business Ethics: A European Review*, 14(1), 6–13.

MCHUGH, F. P. (1988): *Keyguide to Information Sources in Business Ethics*. Nichols, New York.

MCPHERSON, D. (2013). Vocational Virtue Ethics: Prospects for a Virtue Ethic Approach to Business. *Journal of Business Ethics*, 116, 283–296. DOI 10.1007/s10551-012-1463-7

MELÉ, D. (2003): Organizational Humanizing Cultures: Do they generate Social Capital? *Journal of Business Ethics*, 45, 3–14.

MELE, D. (2005). Exploring the principle of subsidiarity in organisational forms. *Journal of Business Ethics*, 60(3), 293–305.

MELÉ, D. (2009): Integrating Personalism into Virtue-Based business Ethics: The Personalist and the Common Good Principles. *Journal of Business Ethics*, 88, 227–244. DOI 10.1007/s10551-009-0108-y

MELÉ, D. (2012): The firm as a community of persons. A Pillar of Humanistic Business Ethos. *Journal of Business Ethics*: 106:89–101 DOI 10.1007/s10551-011-1051-2

MELE, D., ARGANDOÑA A.; SANCHEZ-RUNDE, C. (2011): Facing the crisis: Towards a new humanistic synthesis for business. *Journal of Business Ethics*, 99(1), 1–4.

MITROFF I.I.; DENTON E. A. (1999): A study of spirituality in the workplace. *Sloan Management Review*, 83–92.

MOON, J.; CRANE, A.; MATTEN, D. (2005). Can corporations be citizens? Corporate citizenship as a metaphor for business participation in society. *Business Ethics Quarterly*, 15(3), 429 – 453.

MOORE, G. (2002): On the Implications of the Practice-Institution Distinction: MacIntyre and the Application of Modern Virtue Ethics to Business. *Business Ethics Quarterly*, 12(1), 19–32.

MOORE, G. (2005a): Corporate Character: Modern Virtue Ethics and the Virtuous Corporation. *Business Ethics Quarterly*, 15(4), 659–685.

MOORE, G. (2005b): Humanizing Business: A Modern Virtue Ethics Approach. *Business Ethics Quarterly*, 15(2), 237–255.

MORIARTY, J. (2014): The connection between stakeholder theory and stakeholder democracy an excavation and defense. *Business and Society*, 53(6), 820 – 852.

O'BOYLE, E. J. (2003): Comments on the Foundations of Economic Personalism series. *Journal of Markets & Morality*, 6(2), 617–662.

PEUS, C.; FREY, D. (2009). Humanism at work: Crucial organizational cultures and leadership principles.

RAMOS-RODRIGUEZ, A.R.; RUIZ-NAVARRO, J. (2004): Changes in the intellectual structure of strategic management research: A bibliometric study of the *Strategic Management Journal*, 1980-2000. *Strategic Management Journal* nº 25(10) p. 881-1004. Doi: 10.1002/smj.397.

RONDA-PUPO, G.A.; GUERRAS-MARTIN L.A. (2010): Dynamics of the scientific community network within the strategic management field through the *Strategic Management Jour-*

- nal 1980-2009: The role of cooperation. *Scientometrics* n° 85(3), p. 821-840. Dpi: 10.1007/s11192-010-0287-4.
- SALTON, G.; MCGILL, M. (1983): *Introduction to Modern Information Retrieval*. McGraw-Hill College, New York.
- SCHERER, A. G.; PALAZZO, G (2007): Toward A political conception of corporate responsibility: Business and society seen from a Habermasian perspective. *Academy of Management Review*, 32 (4), 1096 – 1120.
- SCHERER, A. G.; PALAZZO, G.; MATTEN, D. (2014): The business firm as a political actor: A new theory of the firm for a globalized world. *Business and Society*, 53(2): 143– 156.
- SCHOTTER J.; TSOUKAS, H. (2014): In press. *Performing phronesis: On the way to engaged judgment*. Management Learning.
- SHETIA, N. K.; Von GLINOW, M. A. (1985): *Gaining Control of the Corporate Culture*. Jossey-Bass, New York.
- SIGNORI, S.; RUSCONI, G. (2009): Ethical Thinking in Traditional Italian Economia Aziendale and the Stakeholder Management Theory: The Search for Possible Interactions. *Journal of Business Ethics*, 89, 303-318. DOI 10.1007/s10551-010-0391-7
- SIMS, R. R. (1992): The Challenge of Ethical Behavior in Organizations. *Journal of Business Ethics*, 11, 505–513.
- SIMS, R. R. (2000): Changing Ethical Culture Under a New Leadership. *Journal of Business Ethics*, 25, 65–78.
- SIMS, R. R.; BRINCKMANN, J. (2002): Leaders as a Moral Role Models. *Journal of Business Ethics*, 35, 327–339.
- SISON, A.J.G; FONTRODONA, J. (2012): The Common Good of the Firm in the Aristotelian-Thomistic Tradition. *Business Ethics Quarterly* 22 (2) 211–246. DOI: 10.5840/beq201222218
- SISON, A.J.G; FONTRODONA, J. (2013). Participating in the common good of the firm. *Journal of Business Ethics*, 113(4), 611–625.
- SISON, A.J.G; FERRERO, I. (2015): How different is Neo-Aristotelian virtue from Positive Organizational virtuousness? *Business Ethics: A European Review*, 24 (S2). 78-98. <https://doi.org/10.1111/beer.12099>
- SOLOMON, R. C. (1992): Corporate Roles, Personal Virtues: An Aristotelian Approach to Business Ethics. *Business Ethics Quarterly*, 2(3), 317–339.
- SOLOMON, C. R. (1993) [1992]: *Ethics and Excellence: Cooperation and Integrity in Business*. Oxford University Press, New York.
- SOLOMON, C. R. (1999): *A Better Way to Think About Business: How Personal Integrity Leads to Corporate Success*. Oxford University Press, New York.
- SOLOMON, R. C. (2004): Aristotle, Ethics and Business Organizations. *Organization Studies*, 25(6), 1021–1043.
- SPENCE, L. J.; SCHMIDPETER, R. (2003). SMEs, social capital and the common good. *Journal of Business Ethics*, 45(1/2). 93–108.
- TREVINO, L. K. (1986): Ethical Decision Making in Organizations: A Person-Situation Interactionist Model. *The Academy of Management Review* 11(3), 601-617.
- TREVIÑO, L. K. (1990): A Cultural Perspective on Changing and Developing Organizational Ethics. *Research in Organizational Change and Development*, 4, 195–230.
- VOGEL, R. (2012): The visible colleges of management and organization studies: A bibliometric analysis of academic journals. *Organizational Studies* n° 33(8), p. 1015-1043. Doi: 10.1177/0170840612448028.

- WEAVER, G. R. (2006): Virtue in organizations: Moral identity as a foundation for moral agency. *Organization Studies*, 27(3), 341–368.
- WALTON, C. (2004): Character and Integrity in Organizations. The Civilization of the Workplace', *Business and Professional Ethics Journal* 20, 105–128.
- WERHANE, P. H.; FREEMAN, R. E. (1999): Business Ethics: The State of the Art. *International Journal of Management Reviews*, 1(1), 1–16.
- WHETSTONE, J. T. (2002): Personalism and moral leadership: The servant leader with a transforming vision. *Business Ethics: A European Review*, 11(4), 385–392.
- WHETSTONE, J. T. (2003): The language of managerial excellence: Virtues as understood and applied. *Journal of Business Ethics*, 44(4), 343–357
- ZUÑIGA, G. L. (2001). What is economic personalism? A phenomenological analysis. *Journal of Markets & Morality*, 4(2), 151–175.
- ZUPIC, I.; CATER, T. (2015): Bibliometric methods in management and organization. *Organizational Research Methods*. Doi: 10.1177/1094428114562629.

Artículos

XXXIII

CONGRESO INTERNACIONAL
DE **ECONOMÍA APLICADA**

Asepelt

2019

economía azul

Universida_{de}Vigo



Asepelt

Asociación Internacional de Economía Aplicada



THE ROLE OF THE TRUST IN CORPORATE CASH HOLDING POLICY: EVIDENCE FROM EUROPEAN COUNTRIES

MARÍA BELÉN LOZANO

Universidad de Salamanca

MÁRIO SACRAMENTO SANTOS

Coimbra Business School

Abstract

We deeply analyze the impact of societal trust on corporate cash holdings for a European sample suggesting that investors in more (less) trusting countries reveal a less (greater) concern with the financing of new investment showing a negative and significant relation between trust and cash holdings. We also show that risk and abnormal profitability are less relevant in determining cash holdings in low-trust countries. Moreover, we find a nonlinear relationship between the levels of control rights in the hands of the largest shareholder and cash holdings. Furthermore, our results indicate that social trust moderates the blockholder effect. Finally, we find that the presence of multiple large shareholders complements the negative effect of blockholders and this effect is also moderated by social trust.

Keywords: trust, cash holdings, ownership, European firms, blockholders.

JEL classification: G32

1. INTRODUCTION

Growing evidence suggests that cultural attitudes in general and the trust dimension in particular can persist for surprisingly long periods of time. The most relevant research that seeks to explain the large differences observed across countries applies this cultural dimension to free-city states of medieval Italy or the slave trade in Africa (Nunn and Wantchekon, 2011; Guiso et al., 2016). Many economists recognize that trust plays a central role, especially in the area of corporate finance. Previous research suggests that societal trust could enhance corporate resilience to systemic banking crises such as facilitating access to trade credit (Campello et al., 2010; Levine et al., 2018). Trust eliminates the need for formal contracts, which are costly to write, monitor, and enforce (Barney and Hansen, 1995). Cline and Williamson (2016) conclude that societal trust inversely relates to formal self-dealing regulation. It therefore seems that trust provides an alternative mechanism for shareholder protection (Cline and Williamson, 2016). Williamson (1975) supports the notion that trust results in lower transaction costs, such as information searching, negotiation, monitoring and enforcing transactions, because trust reduces opportunism among transacting parties. On the other hand, when agents have little information rely on societal trust for making decisions.

Related to the cash holding literature, the institutional effect and –more incipiently– the cultural effect has been also considered. After the work of Opler et al. (1999), a second wave of literature seek to clarify whether the differences in the accumulation of cash depend on the institutional context (Dittmar et al., 2003; Huang et al., 2013; Pinkowitz et al., 2006). More recently a third wave of research seeks to show how culture conditions the accumulation of cash holdings (Chang and Noorbakhsh, 2009; Chen et al., 2015). More recently Dudley and Zhang (2016) and Xie and Xin (2015) present evidence of a positive correlation between trust and the accumulation of cash holdings.

Given the relevance of the trust effect on the society as a cultural factor –which has been incipiently analyzed (Xie and Xin, 2015; Dudley and Zhang, 2016; Breuer et al., 2017)- and given that the previous studies especially outlined the institutional framework and not in the trust effect, the goal of our work focuses on analyzing whether the degree of a country's trust affects cash holding behavior.

Using a sample of 741 firms from 10 European countries over the period 2009 to 2014, our results suggest the existence of a negative relationship between trust and cash holdings. This result is consistent with what has been found in previous studies where a significant positive correlation has been observed between the level of social trust and the supply of capital (Bottazzi et al., 2016; Levine et al., 2018; Dudley et al., 2017); investment decisions (Bottazzi et al., 2016); financial development (Guiso et al., 2008) and the access to trade credit (Levine et al., 2018).

We also analyze the interaction effects between trust and firm attributes of risk and abnormal profitability obtaining that firms in countries with weaker societal trust show lower sensitivity to cash flow volatility and to abnormal profitability. The fact that the risk is less relevant in explaining the accumulation of cash holdings in low-trust countries is in line with that evidenced by Guiso et al. (2008) that expected agency problems are more severe in low-trust countries which in our opinion

determines a greater rigidity of the policy of cash holdings. As for the result of the cash holdings policy being less responsive to abnormal profitability in low-trust countries finds its main explanation of the fact that in these countries, as already mentioned above, capital raising concerns are more pressing (Gupta et al., 2018). Thus, in these countries, for example, even though companies are profitable, this does not reduce their concerns about the financing of their exploration or investment activity.

Finally, we analyze the ownership concentration in the hands of the largest blockholder, the role played by the second and third large shareholder in the accumulation of cash holdings and the interaction between these two ownership structures and social trust. We obtain a nonlinear relationship between the levels of control rights in the hands of the largest shareholder and cash holdings. At low levels of votings rights, the blockholder effect on cash holdings is negative because blockholders have an incentive effect to bear the cost of monitoring managers and their interests are likely to be aligned with those of minority shareholders. When voting rights reaches a certain point, blockholder objectives diverge with those of other shareholders (type II agency conflict) and the blockholder effect becomes positive. We also show that the blockholder effect is significantly different (positive) in low-trust countries. Hence, we conclude that in low- trust countries the smaller availability of external capital at potentially higher costs increase firms' precautionary motive for which determines a positive correlation between the voting rights in the hands of the main blockholder and the accumulation of cash holdings.

Finally, our research reveals that the interests of the second and third blockholders do not coincide with the interests of the main blockholder being that the former reveal an even greater aversion to the accumulation of cash holdings. Again, the rational of this result seems to us to reside in the conditions of accessing to financing. Firms with multiple large shareholders, in so far as they incur in lower costs of external finance, ponder differently the role played by the accumulation of cash holdings in the financing of new investment opportunities (Attig et al., 2008; Aslan and Kumar, 2012). The contestability effect is economically substantially less relevant in low trust countries. This result confirms that blockholders have substantially lower aversion to the accumulation of cash holdings in low trust countries. This evidence contrasts with the literature and recent research which suggests that the role played by shareholders is more valuable in low-trust environments (Zak and Knack's, 2001; Guiso et al., 2008; Lesmeister et al., 2018) and has as rational more plausible the one suggested before for the way social trust moderates the blockholder effect.

Our paper contributes to the literature on cash holdings policy in different ways. First, we extend the scarce line of research that focuses on the association between social trust and the accumulation of cash reserves (Chang and Noorbakhsh, 2009; Campello et al., 2010; Chen et al., 2015; Xie and Xin, 2015; Dudley and Zhang, 2016; Breuer et al., 2017; Levine et al., 2018). Second, we contribute to this literature by showing that trust plays an important role in shaping cross-country variation in corporate cash holding policy suggesting that the precautionary motive is especially relevant in explaining the accumulation of cash holdings in companies located in low-trust countries. Third, we also contribute with the special profile of our sample -specifically the fact that we gather information

from a short time horizon (2009-2014) that follows the financial crisis of 2008-2009, when public trust unexpectedly declined (Lins et al., 2017). The greater homogeneity of our sample (compared to the previous literature) gathering only a European framework with very similar characteristics (corporate governance, law, financial markets, religion, etc) allows us to ensure that our results are less likely to be biased by the absence of relevant variables. Fourth, we provide evidence deepening on how the level of trust specifically moderates the relationship between the relevant variables of risk and abnormal profitability and the cash holdings, showing that firms in more trusting countries react more expressively to changes in operating conditions in line with the empirical evidence that financial information in more trusting countries is perceived by shareholders as more credible (Pevzner et al., 2015) and the level of social trust has a negative correlation with agency problems between shareholders and managers (Guiso et al., 2008). In other words, in our opinion it will be the greater probability of managers' expropriation behaviors and the lower credibility of the information available to them, which justifies the more rigid policy of cash holdings in low-trust countries. Fifth, we also contribute showing the relevance of considering agency problems in the accumulation of cash holdings which justifies the efforts of the European Union in the last 15 years should be continued in order to improve corporate governance. In this field, we contribute to the literature analyzing the complex effect of the ownership structure taking in account the ownership concentration and the contestability effect and the ability of the trust to moderate these ownership effects, which has been not studied previously. According to our knowledge there is no recent research on this subject in the conduct of the cash holdings policy. In addition, a significant part of relevant research still focuses on the reality of the United States (Dittmar and Mahrt-Smith, 2007; Chen, 2008)

Finally, to the best of our knowledge, we are the first to adopt panel data methodology to explore the relationship between social trust and cash holdings. The methodology system GMM (Arellano and Bover, 1995; Blundell and Bond, 1998) combined with the adoption of dynamic models avoids obtaining biased estimates due to the potential endogeneity¹ of the variables caused by both unobserved heterogeneity and reverse causality. In addition, this methodology allows us to consider the possibility of companies not adjusting instantaneously towards the target cash level (Opler et al., 1999; Ozkan and Ozkan, 2004; Lozano and Durán, 2017; Durán et al., 2016) because the fixed adjustment costs and market frictions (dynamic version of the trade-off theory) could slow down the adjustment to an target level of cash holdings. In sum, our dynamic model allows us to affirm that the methodology adopted in this paper is more robust than that used in previous similar research insofar as it allows us to overcome possible problems due to the endogeneity of the variables and the individual heterogeneity.

The remainder of this paper is set as follows. The next section reviews the theoretical framework and develops the hypotheses analyzing the first the trust effect, then the relationship among trust, cash flow volatility, abnormal profitability and corporate cash holdings and lately we analyze the ownership structure effect. This is followed by the description of the data, variables construction, models and

¹ For example, corporate cash holdings and other capital structure policies such as leverage and debt maturity are jointly determined (Harford et al., 2014).

methodology in epigraph 4. Section 5 discusses the empirical findings and finally we state the main conclusions in the last section.

2. THEORETICAL FRAMEWORK AND DEVELOPMENT OF TESTABLE HYPOTHESES

2.1. THE RELEVANCE OF THE TRUST ON CASH HOLDINGS

Recent studies have emphasized that the behavior of agents differs by country, not only for institutional reasons, but also for deeper reasons that are usually defined as “cultural” (Chui et al., 2010). Trust is a concept that is intimately related to culture. In this way, in recent years, there has been growing interest in the role that trust plays in economic outcomes. Warren Buffet said, “trust is like the air we breathe. When it’s present, nobody notices. But when it’s absent, everybody notices”. Fukuyama (1995, 26) explains that “trust is the expectation that arises within a community of regular, honest and cooperative behavior, based on commonly shared norms, on the part of other members of that community”.

Empirical research carried out during the last 20 years highlights that a higher level of societal trust increases the supply of capital as well as an increase in mergers and acquisitions (Ahern et al., 2015; Bottazzi et al., 2016; Levine et al., 2018; Dudley et al., 2017), international trade and investment (Guiso et al., 2009), higher tax compliance, more efficient justice system, greater efficient bureaucratic, less corruption (La Porta et al., 1997) and innovation (Fukuyama, 1995; Xie et al., 2018). All of these factors have a positive effect on stock returns (Lins et al., 2017) and influence both the cost of equity (Ferris et al., 2017) and earnings announcements (Pevzner et al., 2015). Prior research also established that countries where individuals display greater trust grow more quickly (Knack and Keefer, 1997; Zak and Knack, 2001). Trust is considered to be an integral factor in creating societal capital and consequently in the prosperity of societies (Fukuyama, 1995).

The literature posits several ways that social trust may favor business development. Amongst the many advantages, the literature suggests that trust contributes to mitigating the conflicts between shareholders and managers (Guiso et al., 2008), to the extent that it favors cooperation, reduces uncertainty, and increases information exchange and investors perceive firms’ financial reporting as more credible (Arrow, 1974; Gambetta, 1988). Trust can increase the likelihood and efficiency of collaboration by mitigating collaborating parties’ concerns about opportunistic behaviors of their partners². In line with these arguments, trust facilitates the supply of capital as shareholders believe managers will act in their best interest (Guiso et al., 2008) and it is expected that shareholders in high-trust countries allow firms to maintain larger cash holdings (Dudley and Zhang, 2016; Xie and Xin, 2015). These arguments and empirical evidence, lead to the prediction that trust has a positive effect on the level of corporate cash holding.

H1a. Companies in higher societal trust tend to hold higher cash holdings.

On the other hand, Guiso et al. (2008) state that trust has a significant impact on stock market participation in the sense that less trust in the citizens of a country is

² In other words, and as underlined by Williamson (1993) trust play an economically important role in mitigating the incomplete contracting problem.

associated with significantly lower aggregate trade and investment. According to this line of reasoning, in countries with higher levels of trust, there is less information asymmetry between managers and shareholders, which ensures not only greater access to external sources of financing, but also a reduction of the costs of raising equity. The perceptions by blockholders that managers from high societal trust countries are trustworthy, allow firms to access external finance easily and at a cheaper cost. In this set of countries opportunistic managerial behavior is perceived as socially deviant behavior and imposes significant social costs on managers. Therefore, from a cost-benefit perspective and to the extent that firms operating in high-trust countries, precautionary motive for holding large cash reserves is less relevant because the firms are less likely to suffer from external financing constraints. Thus, we expect trust to have a negative effect on the level of corporate cash holdings. There is a second line of argument, which allows us to anticipate this result because, on the one hand, it is widely recognized that trade credit³ can operate as a complement to traditional bank loans (Campello et al., 2010) and, on the other hand, as argued by Wu et al. (2014), societal trust could facilitate access to trade credit during a banking crisis (Levine et al., 2018). On that way, we would expect companies located in countries with higher societal trust to have a lower need to accumulate cash holding against funding shortfalls in bad times. We thus propose the following hypothesis:

H1b. Companies in higher societal trust tend to have lower cash holdings.

2.2. TRUST, CASH FLOW VOLATILITY AND CORPORATE CASH HOLDINGS

Firms with greater cash flow volatility have greater business uncertainty and thus these firms are expected to hold more precautionary cash (Opler et al., 1999; Palazzo, 2012). Firms with high risk may also hold more cash because of a bigger transaction motive for holding cash (Palazzo, 2012). As widely recognized in the literature (Minton and Schrand, 1999) there is a positive correlation between the volatility of cash flows and the risk perceived by investors, which increases the cost of external finance.

Ferreira and Vilela (2004) and Bates et al. (2009) find that firms with high risks hold more cash based on either precautionary motives or lower transaction-cost motives. In line with the trade-off theory firms with higher levels of uncertainty (especially financially constrained firms) will hold more cash. Finally, but not least important, we expect that firms with higher cash flow volatility are associated with greater information asymmetry between managers and shareholders. According to Myers and Majluf's (1984) pecking order hypothesis, firms that suffer from information asymmetry preferentially use cash to finance investment opportunities.

Guiso et al. (2008) provided evidence that high societal trust is associated with high risk tolerance and it is this correlation that justifies greater stock market participation in countries with high levels of societal trust. Now we question to what extent societal trust is associated with risk tolerance and, in this way, we explore the interaction between the level of trust in a country and the cash flow volatility related to the cash holdings in the firm. Particularly we examine whether the effect of cash flow volatility on corporate cash holdings is less pronounced in lower-trust countries.

³ For Levine et al. (2018) trade credit represents 25% of the average firm's total debt (3500 firms across 34 countries from 1990 to 2011).

Trust can play an important role in the interaction between principal and agent in a context of asymmetric information and given incomplete contracting and the potential for moral hazard (Chami and Fullenkamp, 2002). When trust prevails, shareholders are less concerned about being expropriated (Guiso et al., 2008)⁴. Thus, we hope that the relation between cash flow volatility and cash holdings is less relevant when shareholders are concerned about opportunistic behavior in low-trust countries (Guiso et al., 2008)⁵. To test our conjecture, we interact trust with the variable cash flow volatility.

H2. The effect of cash flow volatility on cash holdings is less significantly in lower trust cultures.

2.3. TRUST, ABNORMAL PROFITABILITY AND CORPORATE CASH HOLDINGS

There is a progressive awareness that profitability is an important determinant of the accumulation of cash holdings. On the one hand, in accordance with the pecking order theory, a higher firm profitability may lead managers to make self-interested decisions and consequently they tend to hold more cash. Consequently, controlling for investment, the most profitable companies should have more cash (Almeida et al., 2004). On the other hand, if we consider cash and profits as substitutes, there should be a negative relationship (Riddick and Whited, 2009). For example, less profitable companies are more likely to be financially constrained and to require cash to meet day-to-day obligations.

Moreover, when we deal with a period associated with restrictions in the supply of external capital –for example, the European crisis period- is expected that the firms increase the cash accumulation to support their operations and capital investments for precautionary reasons. Besides, there are reasons to expect that this reaction of non-financial corporations will be particularly relevant in the context of European countries where the European financial system is predominantly bank oriented and as widely acknowledged bank-lending is highly procyclical. In this context, there are reasons to expect a negative correlation between the abnormal profitability and the accumulation of cash holdings.

Thus, we explore the interaction between the level of trust and the abnormal profitability – as differential effect⁶- and their influence on the cash holding policy. This measure of the abnormal profitability allows us to consider in our models the idea advocated by Haushalter et al. (2007) that companies choose the optimum

⁴ For example, Hilary and Huang (2016) emphasize that among firms operating in US countries there is a negative association between trust and agency problems.

⁵ Recently, Cline and Williamson (2016) conclude that the fact that there is a greater alignment of interests between managers and shareholders in high-trust countries determines in this group of countries a better access to the supply of capital. According to these authors different levels of trust may imply different needs regarding investors' protection. Duarte et al. (2012) also conclude that firms are more likely to obtain funding, when trust is more prevalent. That is, even when the difficulties in obtaining new financing and the cost of these reinforce the advantages of self-financing, the fact that agency problems are exacerbated in less trusting countries leads to blockholders being less sensitive to managers' arguments.

⁶ As we will show, we pretend analyze this differential effect as the abnormal profitability not explained by the traditional variables (not only financial and governance variables but also industry and country fixed effects).

corporate cash holdings taking into consideration the competitive position compared to industry rivals. Zhuang (2017) also conclude for U.S. firms that corporate cash holdings decisions are influenced in a meaningful way by the peer firm's cash policies. Last but not least, in our opinion, the inclusion of this variable introduces, in our models the uncertainty of managers and shareholders regarding future profitability. It is expected that companies with positive abnormal profitability have more optimistic expectations about their future profitability and, vice versa, it is expected that companies with negative values of this variable give greater weight to the fact that the accumulation of cash holdings safeguards the company of eventual liquidity shortage (Fama and French, 2006).

The literature is no unanimous about in what sense the variable trust conditions the variable abnormal profitability. On the one hand, we can expect that the relationship between this variable and cash holdings will be less relevant in high trust cultures because it has been shown that a higher level of societal trust facilitates transactions (Ahern et al., 2015), investments (Knack and Keefer, 1997) or merger and acquisition (Bottazzi et al., 2016; Duarte et al., 2012) and the companies with most investment opportunities are those that face higher costs from the mismatch between uncertain cash flows and expected investment⁷. This statement suggests the possibility that blockholders in high-trust countries appreciate the fact that the company shows an over-profitability as an opportunity to realize new investments with the consequent need to ensure their realization by retaining the benefits far from an indication that they can reduce their concerns about the financing of pre-existing investment opportunities⁸. In addition -as discuss Duarte et al. (2012)- when trust is more prevalent, firms are more likely to obtain funding. Thus, we could expect that this variable will be less relevant in explaining the cash holdings policy of companies located in high-trust countries. Finally, this expectation is also supported for the innovation industry since there is a positive relation between the country's societal trust and innovation activities⁹ (Xie et al. 2018) which could carry out to an increase the precautionary motives for cash accumulation to avoid future financial shortages (Begenau and Palazzo, 2017; Bates et al., 2009). On this basis, we pose the following hypothesis:

H3a. The effect of abnormal profitability on cash holdings is lower in countries with strong societal trust.

However, let us remember that level of trust is very related to the type I agency problem (Xie and Xin, 2015; Dudley and Zhang, 2016). Thus, in countries with lower societal trust -and regardless of the firm's profitability- the blockholders reveal a great concern with the accumulation of cash holdings. In other words, in this set of countries - even among companies that show a profitability lower than the industry average and therefore those that have greater reasons to accumulate cash holdings (precautionary motive)- the high potential of agency problems

⁷ Since this perspective, we come up the evidence about that a high societal trust associated with high risk tolerance (Guiso et al., 2008).

⁸ In line with this hypothesis previous research has found evidence that the effect of cash holdings on firm value is significantly greater in high-trust countries (Pinkowitz et al., 2006).

⁹ Caused by the poor borrowing capacity of intangible technologies because intangible capital cannot be pledged as collateral to raise debt financing.

determines the maintenance of reduced cash holdings. Given that shareholders in less trusting countries are more concerned with the likelihood that managers may engage in opportunistic behaviors (Guiso et al., 2008) it is possible to anticipate a positive relationship between societal trust and corporate cash reserves (Xie and Xin, 2015; Dudley and Zhang, 2016). This attitude of shareholders determines that companies located in less trusting countries -regardless of their specific characteristics- maintain low levels of cash reserves as a rule, which in turn allows us to anticipate an insignificant reaction when companies reveal an over-profitability and therefore they have less reasons to accumulate cash holdings (precautionary motive).

An additional argument that supports this expectation is the fact that investors in more trusting countries respond more vigorously to the information contained in corporate earnings announcements because they perceive financial reporting as more credible (Pevzner et al., 2015). In this case we can anticipate that the abnormal profitability variable is less relevant in the determination of the policy of cash holdings in the case of companies located in low-trust countries. According to this line of reasoning we propose the following hypothesis:

H3b. The effect of abnormal profitability on cash holdings is lower in countries with weaker societal trust.

3. OWNERSHIP STRUCTURE, CORPORATE CASH HOLDINGS AND THE MODERATING EFFECT OF TRUST

3.1. OWNERSHIP CONCENTRATION AND CASH HOLDING: THE TRUST EFFECT

According to the agency theory and the free cash flow hypothesis (Jensen, 1986), self-interested managers in the absence of effective monitoring tend to retain excessive amounts of cash holdings (Dittmar and Maht-Smith, 2007; Gao et al., 2013). In addition, Opler et al. (1999) argued that management accumulated cash because they want greater flexibility to pursue private benefits at shareholders' expense and are more risk averse than shareholders. The literature strongly suggests that blockholders have the economic incentives and power to monitor and sanction managerial mischief, resulting in a better performance of the managers in terms of serving the owners' interest (Jensen and Meckling, 1976; Shleifer and Vishny, 1986). If the ownership is more concentrated it makes the firms less vulnerable to shareholder-manager agency conflicts and we expect a reduction in cash holdings amounts (Dittmar et al., 2003; Ferreira and Vilela, 2004; Dittmar and Maht-Smith, 2007; Harford et al., 2008). This line of argumentation supports the monitoring hypothesis-proposed by Demsetz (1983) and Shleifer and Vishny (1986)- and allows us to anticipate a negative relation between the ownership concentration and cash holdings. We thus propose the following hypothesis:

H4a. We expect a negative relation between the ownership concentration and cash holdings.

However, a large-stake shareholder may exploit minority shareholders (Burkart and Panunzi, 2006). In other words, blockholders appear to have a trade-off relationship between the monitoring and the expropriation effect that depends on their voting rights. Specifically, after some threshold of voting rights, blockholders

may become too entrenched and they may can engage on self-dealing transactions like tunnelling and propping (Fama and Jensen, 1983), making gains from corporate resources at the expense of other shareholders. This is especially true in Europe where the principal agency problem comes more from the conflict between controlling owners and minority shareholders. There is abundant scientific research that supports this possibility (Thomsen and Pedersen, 2000; Miguel et al., 2004).

Additionally, the precautionary motive would be reinforced because blockholders tend to be less diversified than minority shareholders and consequently are more likely to act conservative and loss-averse in the operation of the business (Goergen and Renneboog, 2001). Harford et al. (2008) reports that firms with greater external monitoring allow managers to hold high cash reserves in order to avoid the costs associated with underinvestment. Finally, as is widely recognized, blockholders are primarily concerned with control and the precautionary motive for shareholders is strongly related to the eventuality of the loss of control over the firm. In this sense, Ozkan and Ozkan (2004) provide evidence that firms with blockholders hold higher levels of cash holdings. In addition, a large number of European firms are family controlled (Faccio and Lang, 2002) and Lozano and Durán (2017) document that family firms hold significantly larger amounts of cash in Europe.

In summary, is reasonable to expect that at low levels of concentration the increase in the concentration of votes in the hands of the main blockholder lowers the problems of agency type I which results in a reduction in cash holdings. However, after a certain point of ownership concentration the positive effect of lower agency costs is dominated by negative effects due to rent seeking by blockholders and an increase in the accumulation of cash holdings is expected given that this asset can be turned into private benefits at lower costs than other assets (Pinkowitz et al., 2006; Dittmar et al., 2003; Boubaker et al., 2015). We thus propose the following hypothesis:

H4b. At low (high) levels of voting rights concentration in the hands of the principal blockholder, cash holdings decreases (increases) as a result of the monitoring (expropriation) effect.

Given that the literature shows that blockholders have strong incentives to monitor management and they influence on several aspects of firm behavior -including corporate cash policy-, now we question about the effect that trust exert on this behaviour. As noted previously, when trust is more prevalent, the need for monitoring is reduced insofar as it ensures that the economic agents operate more efficiently. Thus, shareholders -in more trusting countries- expect that a less value will be diverted from the balance sheet and they are more likely to hold the view that the agent will not engage in opportunistic behaviors (Guiso et al., 2008); in this sense they may allow managerial insiders to maintain larger cash holdings (Chami and Fullenkamp, 2002)¹⁰. In other words, when principals are very trusting of agents, there may be less incentive for them to expend the necessary time, energy, and resources in the control of managers' decisions. We thus propose the following hypothesis:

H5. The effect of ownership concentration on cash holdings is higher in low-trust cultures.

¹⁰ Chami and Fullenkamp (2002) propose a formal agency model with trust as an alternative monitoring mechanism.

3.2. CONTESTABILITY AND CASH HOLDING: THE TRUST EFFECT

As to the net effect of the concentration of power in one blockholder¹¹, a recent line of theoretical and empirical research has focused on strategic interaction among multiple large shareholders (MLS). Theoretically, there are two views regarding the role of non-controlling blockholders. The first states that non-controlling shareholders (with at least 10% of voting rights) empowered and motivated either to compete for control or to monitor the largest controlling shareholder lowers the agency problems¹² (Bloch and Hege, 2001; Gomes and Novaes, 2006). The literature (Bennedsen and Wolfenzon, 2000; Gomes and Novaes, 2006) stresses that the positive effect of MLS on corporate governance is all the more effective the greater the number of shareholders that compete for power [reduces the likelihood that MLS will coordinate to extract private benefit (bargaining effect)] and the greater the cash flow rights they have coalition [increases the likelihood of internalizing the effects of its own actions on the firm (alignment effect)]. The second theory points out that others non-controlling shareholders may choose to collude with the controlling shareholder (alignment-of-interests hypothesis) thus creating the means to share the profit of expropriation at the expense of minority shareholders (Zwiebel, 1995; Gomes and Novaes, 2006). As opposed to the above, this possibility is all the greater the smaller the number of elements of the coalition that controls the firm and the smaller the cash flow rights that it has.

The empirical evidence presented so far converges on the recognition that a more equally distributed voting power increases the firm's value (Laeven and Levine, 2008; Maury and Pajuste, 2005), reduces costs of equity capital (Attig et al., 2008), increase shorter debt maturity (Ben-Nasr et al., 2015), higher dividend rates in Europe (Faccio et al., 2001), higher risk-taking (Boubaker et al., 2016; Mishra, 2011), higher leverage (Santos et al., 2014), investment efficient (Jiang et al., 2018). In this paper, we extend this line of research by examining if MLS condition the politics of cash holdings. This is, according to our knowledge a subject not yet explored. The closest article of ours is that of Attig et al. (2013) who conclude that the presence of MLS enhances the value of firm cash.

Although theoretically the existence of MLS can determine collusion between these, since cash is the asset that can most easily be appropriated by the insiders (Smith, 2016), considering that the companies reveal in the last 10 years historically high cash holdings (according to a study by PricewaterhouseCoopers) and given de fact that almost all research attributes to the existence of MLS a positive role in corporate governance (monitoring and/or alignment and/or bargaining effect) we anticipate a negative correlation between the power of non-controlling shareholders beyond the principal blockholder and the accumulation of cash holdings. In addition, as firms with MLS incur in lower costs of external finance, ponder differently the role played by the accumulation of cash holdings in the financing of new investment opportunities (Attig et al., 2008; Aslan and Kumar,

¹¹ See active monitoring hypothesis versus passive voter hypothesis" (Shleifer and Vishny, 1986; Pound, 1988).

¹² Not only the most obvious Type II agency problems but also Type I agency problems, because in most of the countries of our sample, the main blockholder does not rarely participate directly or indirectly in the management of companies.

2012) and in addition, the fact that they distribute more dividends (Faccio et al., 2001). Thus, we propose the following hypothesis:

H6. We expect a negative relation between the voting rights of the non-controlling shareholders behind the principal blockholder and cash holdings.

Now we introduce the cultural dimension of trust because, as already emphasized above, social trust not only can facilitate financial transactions (Knack and Keefer, 1997; La Porta et al., 1997) but also has a negative correlation with agency problems (Guiso et al., 2008; Chami and Fullenkamp, 2002). For its part, the existence of MLS has also been associated with the reduction of agency conflicts between the principal blockholder and minority shareholders (Pagan and Röell, 1998). Additionally, higher control contestability of the principal blockholder and the level of trust prevents opportunistic self-serving behavior (Knack and Keefer, 1997; Bloch and Hege, 2001; Gomes and Novaes, 2006). Furthermore, recent studies establish an association between the level of trust and the existence of MLS with financial risk-taking behavior (Guiso et al., 2008; Boubaker et al., 2016; Mishra, 2011).

The research also suggests some complementarity between the level of social trust and the existence of MLS. First, Hasan et al. (2017) associate the level of social trust with lower bank loan spreads and Attig et al. (2008) associate the presence of MLS with lower costs of equity capital. Second, Maury and Pajuste (2005) and Laeven and Levine (2008) present empirical evidence suggesting that an equally distributed voting power increases the firm's value. In a similar vein, Lins et al. (2017) also associate the level of social trust with higher firm value. Considering all these arguments, we thus formulate the following hypothesis:

H7. The contestability of the principal blockholder is more relevant in low-trust countries.

4. DATA, VARIABLES AND METHODOLOGY

4.1. DATA

Our sample includes 10 European countries: Finland, France, Germany, Greece, Italy, Norway, Spain, Sweden, Switzerland, and the United Kingdom, from the AMADEUS database. Consistent with the literature and to avoid distortions due to regulation, we eliminate firms from the sample that are from the financial services industry (SIC Codes between 6000 and 6999) and regulated industry (SIC Codes between 4900 and 4999). We also exclude firms reporting data that are not feasible as negative values for the following variables: total assets; tangible fixed assets; shareholder's funds; non-current liabilities and current liabilities) and firms that have missing data. To mitigate the impact of outliers on our results, first we eliminate observations that are clearly outliers and after we winsorise all financial variables at the mean plus or minus three times the standard deviation (Schauten et al., 2013). Finally, the requirements of the system GMM approach developed by Blundell and Bond (1998) adopted, as well as the objective of seeking a sample with seven consecutive years of data, our final data set contains 4,446 firm-year observations (741 listed non-financial firms) for the years 2009 to 2014 across 10 countries in Europe extracted from AMADEUS (Bureau van Dijk). Note the relevant specific period of our study which overlap the whole European macroeconomic slowdown.

In relation to the sample, European listed companies were selected for this study for two reasons: one, in these firms, ownership concentration is pronounced, most of them have controlling shareholders and multiple non-controlling large shareholders which allows us to study not only the monitoring effect of the controlling shareholders but also the relationship between majority and minority shareholders. In that way, our sample allows us to assess the way in which both agency relations affect the accumulation of cash holdings. The other reason is that our sample -that groups countries that almost all share a common market- is much smaller compared to other works¹³ and has a lower cultural heterogeneity and much greater homogeneity in terms of corporate governance¹⁴. The greater homogeneity of our sample, both in terms of shared values, as well as the principles of governance that more or less closely encompass the behavior of managers and blockholders, reduces the possibility of our results to be skewed.

As noted in the literature, trust as cultural concept, develops with many other country time invariant features (such as individualism, uncertainty avoidance, ambiguity aversion, masculinity, long-term orientation and religiosity) but in the empirical research there is a clear prevalence of legal origins (La Porta et al., 2008). Thus, Cline and Williamson (2016) conclude that there is a significant and negative association between trust and formal self-dealing regulation. Carlin, et al. (2009) argue that, when social capital is valuable, trust and regulation are potentially substitutes. The fact that the sample includes the UK allows us to assess whether the effect of the trust variable is moderated by the legal context. For example, strong investor protection makes it very costly for managers to pursue their conflicting personal interests over shareholders' interests, thus mitigating agency problems. Existing literature suggests that the discretionary nature of investment is greater when shareholder protection is poor. In this perspective, studies including Dittmar et al. (2003), Pinkowitz et al. (2006) and Drobetz et al. (2010) find that firms in weak shareholder protection countries tend to hold excess cash.

4.2. BASELINE SPECIFICATION AND VARIABLES

The literature suggests that firms will adjust their cash holding variation progressively toward the target level depending on their needs and the adjustment costs (Ozkan and Ozkan, 2004; Lozano and Durán, 2017). To capture this adjustment process, we use a general dynamic adjustment model of cash holdings specified as Eq. (1):

$$\begin{aligned}
 \text{CASHIND}_{i,t} = & \beta_0 + \beta_1 \text{CASHIND}_{i,t-1} + \beta_2 \text{TRUST}_i + \beta_3 \text{CFV}_{i,t} + \beta_4 \text{RROA}_{i,t} + \beta_5 \text{LSBLOCK1}_{i,t} \\
 & + \beta_6 \text{SCORE}_{i,t} + \beta_7 \text{CF}_{i,t} + \beta_8 \text{TOBINQ}_{i,t} + \beta_9 \text{DEBT}_{i,t} + \beta_{10} \text{MATURITY}_{i,t} + \\
 & \beta_{11} \text{SIZE}_{i,t} + \beta_{12} \text{TANG}_{i,t} + \beta_{13} \text{CAPEX}_{i,t} + \beta_{14} \text{NWC}_{i,t} + \beta_{15} \text{GROWTH}_{i,t} + \\
 & \beta_{16} \text{AGE}_{i,t} + \lambda_i + \zeta_t + \delta_s + \theta p + \varepsilon_{i,t}
 \end{aligned} \tag{1}$$

¹³ Thus, the sample of Xie and Xin (2015) gather 41 countries and that of Dudley and Zhang (2016) 54 countries.

¹⁴ The European Commission has recently (2015) drafted a "Guide to Corporate Governance Practices in the European Union" with the ultimate goal to help European companies to develop best corporate governance practices.

where, for firm i and year t , the dependent variable is firm industry-adjusted cash holdings ($CASHIND_{i,t}$) is defined as the difference between actual and the average observed in the sector of activity of the firm for firm i during year t (Gao et al., 2013). In the construction of this variable we use the logarithm of a firm's cash ratio, which is the amount of cash and cash equivalents divided by total assets net of cash and cash equivalents (Opler et al., 1999; Harford et al., 2008). Note that this model comprises the following five terms: λ_i , ζ_t , δ_s , θ_p and $\epsilon_{i,t}$ enable us to control for an unobserved firm-specific, time-specific, industry, country legal systems and the random disturbance, respectively. Country legal systems (θ_p) are classified into (La Porta et al., 2008) four legal-origins categories: Anglo- Saxon, Scandinavian, German, and French (Lesmeister et al., 2018).

In Table 1 we report a brief description of the variables used in the empirical analysis and its calculation procedure. The variables largely argued previously Cash flow volatility ($CFV_{i,t}$) and $LSBLOCK1_{i,t}$ are measured respectively as the standard deviation of a firm's cash flow in previous three years and the percentage of control rights held by the largest shareholder. Our main variable $TRUST_i$ reflects the level of social trust in a firm's country derived from the World Values Survey (WVS). We follow prior studies in the trust literature that use transformed responses to the World Values Survey (WVS) question "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (La Porta et al., 1997; Guiso et al., 2008; Xie and Xin, 2015; Dudley and Zhang, 2016). This proxy provides a measure of generalized interpersonal trust. A positive (negative) coefficient on β_2 indicates greater (lower) cash holdings for firms in higher-trust countries.

Following previous empirical works, we analyze other aspects also related to culture. Thus, for capturing country-year specific level of investor protection we use $SCORE_i$ following Dudley and Zhang (2016). These authors calculate the first principal component of a set of country-level governance variables highly correlated with each other (Regulatory Quality, Control of Corruption, Political Stability, Rule of Law, Voice and Accountability and Government Effectiveness following Kaufmann et al., 2009)¹⁵. The lack of consideration of the $SCORE_i$ variable in our models would always raise the question of whether our results would not be biased because they did not consider a set of country- level measures of shareholder rights (Dittmar et al., 2003) and corporate governance practices (Harford et al., 2008) that are associated with cash holdings.

$RROA_{i,t}$ variable (abnormal profitability) informs us about the existence of a level of profitability not explained by the most relevant factors in the literature. The variable $RROA_{i,t}$ is the deviation of the firm's performance relative to its expected value of the OLS estimator. That is to say, the absolute deviation between observed $ROA_{i,t}$ and the predicted value of $ROA_{i,t}$ using the following model based on previous researches such as Anderson and Reeb (2003), King and Santor (2008), Huang et al. (2015), Bennouria et al. (2018), among others:

¹⁵ <http://info.worldbank.org/governance/wgi>

$$ROA_{i,t} = \beta_0 + \beta_1 DEBT_{i,t} + \beta_2 MATURITY_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 CASH_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 ATR_{i,t} + \beta_7 TANG_{i,t} + \beta_8 CAPEX_{i,t} + \beta_9 NWC_{i,t} + \beta_{10} AGE_{i,t} + \beta_{11} LSBLOCK1_{i,t} + \beta_{12} FAMILY_{i,t} + \zeta_t + \delta_s + \theta p + \varepsilon_{i,t}^{16} \quad (2)$$

Where $ROA_{i,t}$ is a ratio that measures a company's earnings before interest and taxes ($EBIT_{i,t}$) relative to its total assets. The asset turnover ratio ($ATR_{i,t}$) is the percentage of a company's revenue to the value of its average total assets. $CASH_{i,t}$ is the natural logarithm of cash and cash equivalent scaled by net assets. $FAMILY_{i,t}$ is a dummy variable that equals one if the largest shareholder is an individual or a family with at least 10 % of the voting rights and zero otherwise. The remaining variables have been previously defined in Table 1.

The remaining variables of the equation are now briefly explained. Previous empirical evidence shows that corporate managers tend to hold more cash when they face higher operating cash flows to hedge themselves from periods of shortage of funds (Opler et al., 1999; Dittmar et al., 2003; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004; Gao et al., 2013; Chen et al., 2015; Fernandes and Gonenc, 2016; Bates et al., 2018). Thus, we use Cash flow variable ($CF_{i,t}$) measured as the ratio of net income plus depreciation scaled by total assets. We expect that the firm's Tobin's Q ($TOBINQ_{i,t}$) -defined as the ratio of the sum of the market value of equity and the book value of debt to the book value of assets.- has a positive effect on cash holding following the arguments of Myers and Majluf (1984), Opler et al. (1999), Dittmar et al. (2003), Ferreira and Vilela (2004), Ozkan and Ozkan (2004), Chen (2008), Duchin (2010); Harford et al. (2014), Chen et al. (2015), Fernandes and Gonenc (2016), Bernile et al. (2017), and Bates et al. (2018). With respect to the debt variable ($DEBT_{i,t}$) and following both the pecking order theories and trade-off theory, we expect a negative relation with cash holdings because highly leveraged firms face high costs in attracting external financing and consequently should hence hold less cash (Kim et al., 1998; Ferreira and Vilela, 2004; Chen, 2008; Gao et al., 2013; Harford et al., 2014; Chen et al., 2015; Fernandes and Gonenc, 2016; Bates et al., 2018). $DEBT_{i,t}$ is a sum of long-term debt plus debt in current liabilities, divided by total assets. For $MATURITY_{i,t}$ variable measured as the short-term debt of the firm in year t divided by the sum of short-term debt with long-term debt the literature infers, on the one hand, a positive relation between shorter maturity debt (greater refinancing risk) and cash holdings (Harford et al., 2014) and, on the other hand, a negative relation (Brick and Liao, 2017).

We suppose that larger firms need lower cash holdings since they would suffer from less informational problems asymmetry and consequently they have easier access to outside funding (Dittmar et al., 2003; Chen, 2008; Duchin, 2010; Bigelli and Sánchez- Vidal, 2012; Gao et al., 2013; Huang et al., 2013; Harford et al., 2014; Chen et al., 2015; Fernandes and Gonenc, 2016; Bernile et al., 2017; Bates et al., 2018). Thus, $SIZE_{i,t}$ controls the size of firms and is calculated as the log value of total assets. $TANG_{i,t}$ is defined as the ratio of fixed assets to total assets.

¹⁶ We do not report the output of these regression in the paper. The coefficients on all control variables are broadly consistent with the ones estimated in the previous literature. Output from these regressions is available from the authors upon request.

As underlined by Lei et al. (2018), firms with high tangible assets generally face lower financing costs and are less prompted to build up precautionary savings (Bates et al., 2009; Fernandes and Gonenc, 2016; Bernile et al., 2017). For investment variable $CAPEX_{i,t}$ we expect a negative relation given that investment expenditures not only deplete internal resources as it reduces the benefits associated with the maintenance of cash holdings. In fact, fixed capital investment expenditures, *ceteris paribus*, reducing the cost of raising external finance and thus reduce the benefits underlined by the trade-off theory of cash holdings: transaction cost and the precautionary motive for a firm's cash holdings (Dittmar et al., 2003; Bates et al., 2009; Chen, 2008; Gao et al., 2013; Harford et al., 2014; Fernandes and Gonenc, 2016; Bates et al., 2018). The inverse expected sign of the coefficient of the $NWC_{i,t}$ variable is explained because working capital serves as a good substitute for holding a high level of cash because of ease of conversion into cash (Dittmar et al., 2003; Ferreira and Vilela, 2004; Chen, 2008; Bates et al., 2009; Duchin, 2010; Gao et al., 2013; Huang et al., 2013; Harford et al., 2014; 17; Chen et al., 2015; Fernandes and Gonenc, 2016; Bates et al., 2018). $CAPEX_{i,t}$ is measured as new acquisitions of tangible assets scaled by total assets and $NWC_{i,t}$ as the working capital net of cash scaled by total assets. Assuming the past sales growth as a good measure of investment opportunities, in line with La Porta et al. (2000), we expect a positive coefficient (Dittmar et al., 2003; Gao et al., 2013). $GROWTH_{i,t}$ is measured as the current year's sales minus last year's sales divided by lagged sales. Finally, consistent with the research by Gao et al. (2013), the expected relation for $AGE_{i,t}$ –as the number of years since the firm began its activity - expressed in logarithms- is positive.

4.3. ESTIMATION METHOD

We use system GMM estimator which possesses the non-negligible vantage of explicitly considering the endogeneity problem in the empirical analysis of cash holdings. In addition, this methodology takes into account the so-called constant unobserved heterogeneity, that refers to a series of characteristics that may affect the cash holding policy (board size, identity of the main blockholder; quality of the management team; competitive position) and are time-constant. Additionally, this methodology constitutes a good alternative when the researcher is concerned about the possibility with the reverse causality¹⁷. Finally, the GMM is particularly suitable to deal with the potential dynamic nature of cash holdings (Ozkan and Ozkan, 2004; Lozano and Durán, 2017; Durán et al., 2016). There is a broad consensus that in the exploration of dynamic models several estimation techniques are likely to generate biased estimates (Flannery and Hankins, 2013).

It has become standard practice nowadays to use the GMM system methodology because this methodology avoids obtaining biased estimates due to the potential endogeneity of the variables caused by both reverse causality and unobserved heterogeneity. All of our models comprise five types of error terms: (i) λ_i is the unobserved firm-specific fixed effect; (ii) ζ_t is a time effect; (iii) δ_s is an industry-effect; (iv) θ_p is country legal systems (La Porta et al., 2008); (v) finally, $\epsilon_{i,t}$ is an idiosyncratic error term.

¹⁷This could happen, for example, when past cash holdings affect the current level of ownership concentration and if cash holdings are highly persistent

In order to ensure the consistency of the estimates and to check for the potential misspecification of the models. First, we follow Arellano and Bond (1991) and provide the AR2 test to detect any pattern in the differenced time series residuals of the individual cross sections. Second, to address the issue of “too many instruments”, we use the “collapse” option in `xtabond2` (Roodman, 2009). Third, in order to maximize efficiency, we empirically use a newly modified two-step system GMM, and we correct the standard errors for the small-sample bias of the two-step estimator using the Stata command “`small`” that produces a more accurate estimate by implementing the “Windmeijer correction” (Windmeijer, 2005). Fourth, we present Wald tests for the joint significance of the estimated coefficients (z_1), the time effect (z_2), legal origin (z_3) and sector effect (z_4). Finally, the specification tests for all models show benign p-values, that is, either the Hansen test for identifying restrictions or the differenced Hansen test for the validity of the instruments.

5. RESULTS

5.1. DESCRIPTIVE STATISTICS

Table 2 reports descriptive statistics for our 4,446 firm-year observations. On average, a firm holds 11% percent of net assets. Note some differences with the Dudley and Zhang (2016) work. For example, while in our sample the mean and median are respectively 0.110 and 0.078 in their paper the corresponding values are respectively 0.155 and 0.090. This variable also reveals in our sample (non-tabulated values) an extraordinary constancy of the different values of the descriptive statistic over time¹⁸. Besides, in our sample, in average terms, the size of the companies is significantly higher and the NWC variable has also substantially higher values. In terms of fixed capital investment values are very close in both samples. Note also that for our sample the largest shareholder owns on average 40.02% of a firm’s voting rights.

In Table 2 we report the descriptive statistics by country. Our sample shows an appreciable cross-country variation for the level of social trust, with a set of values ranging from the lowest 0.23 for France, and Greece to the highest value 0.70 for Norway, being the average of 0.365. The Pearson correlation between a firm’s cash-to-assets ratio and social trust is negative (-0.094) and significant at 1% level different to the positive correlation obtained by Xie and Xin (2015) and Dudley and Zhang (2016) samples (respectively 30% and 14%).

5.2. REGRESSION ANALYSIS

5.2.1. BASELINE REGRESSION

In this section, we show the results of our regression analysis on the relation between cash holdings and trust. We test H1a and H1b using the following specification, similar to equation (1):

¹⁸ As an example, the average and the median for the years 2009-2014 are respectively: 0.127/0.084; 0.127/0.083; 0.120/0.078; 0.121/0.079; 0.129/0.083; 0.127/0.084. Besides, the distribution of the observations with more cash (higher than the average of the global sample) coincides with the distribution of the sample by the different countries. The exception is the one observed for France. For this reason, we will later test our main model without French companies.

$$\text{CASHIND}_{i,t} = \beta_0 + \beta_1 \text{CASHIND}_{i,t-1} + \beta_2 \text{TRUST}_i + \gamma \text{CONTROLS}_{i,t} + \lambda_i + \zeta_t + \delta_s + \theta_p + \varepsilon_{i,t} \quad (3)$$

Where i and t denote firm and year, respectively and the dependent variable ($\text{CASHIND}_{i,t}$), and the variable TRUST_i were previously defined. $\text{CONTROLS}_{i,t}$ is a vector of control variables suggested by previous literature and are as defined earlier. We now address the main focus of our research agenda examining the impact of trust on cash holdings. Consistent with H1b, the coefficient on TRUST_i is -0.2523 (t-stat = -2.64) after controlling for firm characteristics that are known to be associated with corporate cash policy, the strength of shareholder rights (variable SCORE_i) and country legal systems. Our results confirm that the precautionary savings motivations are a significant determinant of the observed variation in cash holdings contrasting with the empirical evidence presented by Dudley and Zhang (2016) and Xie and Xi (2015). A higher level of trust not only reduces the concerns about the accessibility of external capital and reduces the costs of raising equity but also, as evidenced by Wu et al. (2014) and Levine et al. (2018), facilitate access to trade credit (which together leads to less concern about the potential shortage of financial resources in the implementation of future investment opportunities).

We also include a set of control variables affecting firm cash holdings. We note that the sign on the control variables are consistent with prior results in the literature (Chen et al., 2015; Dudley and Zang, 2016). According to our expectations, cash flow volatility has a significantly positive correlation (0.3379, t-stat = 2.41) with the change in cash holdings (Ferreira and Vilela, 2004; Bates, et al., 2009; Duchin, 2010; Gao et al., 2013; Huang et al., 2013; Harford et al., 2014; Chen et al., 2015; Dudley and Zang, 2016; Bates et al., 2018) based on either precautionary motives or lower transaction-cost motives. Our evidence also suggests that companies with over-profitability have more optimistic expectations about their future profitability; they ponder in a different way the marginal costs and marginal benefits of holding cash (the trade-off theory) and give lower weight to the fact that the accumulation of cash holdings safeguard the company of eventual liquidity shortage (-0.8454, t-stat = -3.35). With respect to the influence of voting rights of the main blockholders in cash holdings, we find a negative signify relation (-0.1008, t-stat = -1.98). Our findings support the results of Ferreira and Vilela (2004) and Fernandes and Gonenc (2016) that companies with more concentrated ownership are less vulnerable to shareholder-manager agency conflicts and, consequently, have lower cash holdings. The coefficient of the SCORE_i variable confirms the existence of a negative correlation between country-year specific level of investor protection and the accumulation of cash holdings (-0.0777, t-stat = -2.29). This result provides empirical evidence to the argument that shareholders in countries with better investor protection have more power to force managers to disgorge large cash balances (Dittmar et al., 2003; Frésard and Salva, 2010; Dudley and Zang, 2016).

Following the pecking order theory of Myers and Majluf (1984) we find a positive and statistically significant coefficient of the cash flow variable (0.7845, t-stat = 4.62) and this result is consistent with previous empirical evidence. As expected, $\text{TOBINQ}_{i,t}$ has a positive effect on cash holding (0.1684, t-stat = 3.69) thus confirming that growth opportunities are an important factor that positively affect cash levels, also in accordance to previous evidence. In line with previous research, $\text{DEBT}_{i,t}$ is negatively correlated with cash holdings (-0.2639, t-stat = -

2.61) as suggested both the pecking order theories and trade-off theory. Our regression results show a significantly negative relationship (-0.0792, t-stat = -5.31) between debt maturity and cash holdings (Ferreira and Vilela, 2004; Brick and Liao, 2017). SIZE_{i,t} confirms that larger firms hold lower cash holdings (-0.0325, t-stat = -3.50) and, given the existence of contracting frictions and limited enforceability the control variable TANG_{i,t} shows the coefficient expected (-0.1971, t-stat = -2.35). As expected the CAPEX_{i,t} investment variable has a negative coefficient (-0.1406, t-stat = - 4.13) and the sign of the coefficient of the NWC_{i,t} variable (-0.4772, t-stat = -7.01) confirms the expected negative correlation between working capital and cash balances. Related to the GROWTH_{i,t} variable, the coefficient in our research is negative (-0.0903, t-stat = -2.09). This result is supported by recent research by Bernile et al. (2017), for companies in the S&P1500. Our interpretation is that the growth of turnover requires an increased investment in working capital that not only depletes any accumulated resources but also constitute substitute investments. Finally, our research confirms that older firms tend to hold higher cash levels (0.0369, t-stat = 3.14).

5.2.2. DEEPING ON TRUST, RISK AND ABNORMAL PROFITABILITY

We next examine if the effect of variables risk and abnormal profitability varies across firms located in countries with differing levels of trust. If the effects of the variables CFV_{i,t} and RROA_{i,t} on cash holdings are asymmetric, we should find the estimated coefficients on these interaction terms to be significantly different from zero ($\beta_5 \neq 0$, model 4). We test H2 using the following specification:

$$\begin{aligned} \text{CASHIND}_{i,t} = & \beta_0 + \beta_1 \text{CASHIND}_{i,t-1} + \beta_2 \text{CFV}_{i,t} + \beta_3 \text{RROA}_{i,t} + \beta_4 \text{DTRUST}_i + \\ & \beta_5 \text{DTRUST}_i \times \text{CFV}_{i,t} + (\beta_5 \text{DTRUST}_i \times \text{RROA}_{i,t}) + \gamma \text{CONTROL}_{i,t} + \lambda_i + \zeta_t + \delta_s \\ & + \theta_p + \varepsilon_{i,t} \end{aligned} \quad (4)$$

Where, DTRUST_i is a dummy where a value of 1 is assigned for companies from the countries with TRUST_i ≤ 0.35. The value of 1 is assigned to companies from the following countries: France, Greece, Italy, Spain and United Kingdom (59.92% of observations). Controls is a vector of control variables suggested by previous literature and are as defined earlier. In regression (2) of Table 4 we find that the coefficient of the interaction term DTRUST_i × CFV_{i,t} is negative (-0.9427, t-stat = -3.32), suggesting that the positive effect of cash flow volatility on corporate cash holdings is less pronounced (approximately null) in low trust countries, thus supporting H2. Our evidence complements the research of Chen et al. (2015) who conclude that uncertainty avoidance triggers greater incentives for firms to hold cash when cash flow volatility rises¹⁹. These findings are consistent with the agency hypothesis which predicts that shareholders in countries with low levels of social trust are less likely to believe that managers are trustworthy (Guiso et al., 2008). As a consequence, although managers argue that the company's activity recommends a greater concern with the financing of possible investment, the fact that agency problems are exacerbated in less trusting countries leads to

¹⁹ High-uncertainty-avoidance cultures are characterized by a need to reduce risk (Kale and Barns, 1992).

blockholders being less sensitive to managers' arguments. Most recently, Huang and Shang (2019) also conclude that mutual trust among people within a community reduces the need to discipline the manager with debt.

In model 3 of Table 4 we find that the coefficients on the interaction terms, $DTRUST_i \times RROA_{i,t}$ is positive and significant at the 1% level, suggesting that the negative effect of $RROA_{i,t}$ on corporate cash holdings is less pronounced in countries with weaker social trust $[-0.2822 (-0.9505 + 0.6683)]$ while in the other countries it is $-0.9505]$ supporting H3b. Our empirical evidence confirms our expectation that the reduction of concerns about the financing of new investment opportunities resulting from companies having better expectations of future profitability ($RROA_{i,t} > 0$) has a greater effect on corporate cash holdings in countries with higher levels of trust because in these countries investors are more willing to provide capital to firms, making external finance more accessible (among others, Gupta et al., 2018) and consequently this reduces firms' precautionary saving motive. Taken together, regressions (2) and (3) of Table 4, we can say that the risk and abnormal profitability variables seem to moderate much less the policy of cash holdings in low-trust countries.

5.2.3. DEEPING ON TRUST AND OWNERSHIP STRUCTURE

But before proceeding with testing whether the blockholder effect on the firm's cash holdings is higher in low-trust countries, we check the sole role of ownership concentration in cash holdings. The results in regression (1) of Table 5 for the variable $LSBLOCK1_{i,t}$ reveal a significant negative coefficient (-0.1151) supporting H4a and confirming that the presence of blockholders reduce corporate misbehavior and affect managers' flexibility and decisions related to corporate cash holdings (Ferreira and Vilela, 2004; Chen, 2008; Fernandes and Gonenc, 2016). In this way our research confirms not only the validity of the free cash flow theory of Jensen (1986), according to which managers have a natural tendency to accumulate cash and then waste excess cash in negative net present value projects but also that blockholders do not behave according to the "passive voters hypothesis" (Pound, 1988). It is thus clear that the size of voting rights on the hands of the main blockholder addresses the agency problem Type I and ensure that management serves shareholder interests (Shleifer and Vishny, 1997). Our evidence differs from those revealed by Anderson and Hamadi (2016) and Ozkan and Ozkan (2004). Thus, we do not confirm that the precautionary motive is strengthened in the presence of blockholders or that the accumulation of cash holdings constitutes a mechanism that the controlling shareholders use to ensure the control of companies.

However, and consistent with our hypothesis H4b, we find that after rising to a certain level of ownership concentration there is an inflection point (see significant coefficient of $SQLSBLOCK1_{i,t}$ 0.2721) where the voting rights are greater than 61.17% ²⁰. This result suggests that when blockholders have an incentive to bear

²⁰ In our sample, 18.65% of the observations have a concentration of voting rights in the hands of the main blockholder higher than 61.17%. The quadratic relation proposed in Column 1 of Table 6 presents only one breakpoint, which can be optimally derived by differentiating cash holdings with respect to ownership concentration. Letting this partial derivative equal zero, this breakpoint is $LSBLOCK1_{i,t} = -(-0.1151 / (2 \times 0.2721)) + 40.02\% = 61.17\%$, where 40.02% is the average of the original variable which for reasons of multicollinearity we had to transform. The transformed variable is equal to the initial variable subtracted from the average (Aiken and West, 1991).

the cost of monitoring managers but do not have the absolute control of the companies (voting rights smaller than 61.17%), their interests remain aligned with those of minority shareholders and the blockholder effect on cash holdings is negative. The effect becomes positive, however, when the main blockholder is sufficiently large to fully control the firm (entrenchment hypothesis), and the accumulation of cash holdings constitutes a way that enhances to pursuit their particular interests (self-dealing transactions) at the expense of minority shareholders (Shleifer and Vishny, 1997). Our results for the variable LSBLOCK1_{i,t} confirm the empirical evidence of Boubaker et al. (2015) for French listed firms.

Now in model 2 of Table 5 we test the influence of the ownership concentration on the firm's cash holdings in a framework of different trust. The specification for the model is as follows:

$$\begin{aligned} \text{CASHIND}_{i,t} = & \beta_0 + \beta_1 \text{CASHIND}_{i,t-1} + \beta_2 \text{LSBLOCK1}_{i,t} + \beta_3 \text{DTRUST}_i \times \text{LSBLOCK1}_{i,t} + \\ & \beta_4 \text{DTRUST}_i + \gamma \text{CONTROLS}_{i,t} + \lambda_i + \zeta_t + \delta_s + \theta_p + \varepsilon_{i,t} \end{aligned} \quad (5)$$

Our results confirm that the effect of ownership concentration is lightly positive in low- trust countries 0.0255 (-0.1834 + 0.2089) while in the other countries it is negative (- 0.1834). This result although confirming that the of ownership concentration depends on the level of trust that prevails in a country²¹ does not support our hypothesis H5 that anticipated the possibility of blockholders in low-trust countries being even more restrictive in the politics of cash holdings due to the fact that in these countries agency problems Type I are more severe (Guiso et al., 2008; Chami and Fullenkamp, 2002). However, our evidence supports, once again, the idea that in low-trust countries the smaller availability of external capital at potentially higher costs and less trade credit (Levine et al., 2018) increase firms' precautionary motive for which determines a positive correlation between the voting rights in the hands of the main blockholder and the accumulation of cash holdings. Consequently, we can say that the behavior of blockholders in low-trust countries seems to result more from the fact that in these countries there are more difficulties in financing new investment opportunities than the equally relevant fact that in these countries the agency problems with managers are also greater²².

Next, we explore if there is a direct relationship between the capacity of the second and third largest shareholders to challenge the first largest blockholder and the level of cash holdings.

$$\begin{aligned} \text{CASHIND}_{i,t} = & \beta_0 + \beta_1 \text{CASHIND}_{i,t-1} + \beta_2 \text{TRUST}_i + \beta_3 \text{LSBLOCK1}_{i,t} + \\ & \beta_4 \text{COALITION}_{i,t} + \gamma \text{CONTROLS}_{i,t} + \lambda_i + \zeta_t + \delta_s + \theta_p + \varepsilon_{i,t} \end{aligned} \quad (6)$$

²¹ The ownership concentration in Europe has a negative correlation with social trust (Holderness, 2017).

²² This result and the fact that the United Kingdom includes countries classified as low-trust countries has determined the need to assess whether the result is maintained for a sample without the United Kingdom. As we will see later our results are not driven by one particular country.

In regression (3) of Table 5, both the coefficient of LSBLOCK1_{i,t} (t-stat. of -2.07) and the coefficient of COALITION_{i,t}²³ (t-stat. of -2.60) are negative. In other words, not only is there evidence that the reduction of agency problems Type I (greater monitoring power of blockholders) leads to a reduction in the accumulation of cash holdings (negative coefficient of LSBLOCK1_{i,t}), but it is also clear that the interests of the second and third blockholders do not coincide with the interests of the main blockholder (negative coefficient of COALITION_{i,t}).

This result (consistent with hypothesis 6) confirms that the contestability of the main blockholder reduces their potential expropriation behavior, among other reasons, because, as Maury and Pajuste (2005) point out, an increase in the number of blockholders coalitions leads to greater internalization of the diversion costs. Additionally, our evidence supports the idea that firms with multiple large shareholders, in so far as they incur in lower costs of external finance, ponder differently the role played by the accumulation of cash holdings in the financing of new investment opportunities (Attig et al., 2008; Aslan and Kumar, 2012). Even when we analyze in regression (4) of Table 5 the possibility of the blockholder effect being non-linear (without this addition means adding significant multicollinearity problems), the contestability effect is negative and significant.

Next, we explore whether the contestability effects on cash holdings is moderated by the variable DTRUST_i. The specification for the model is as follows:

$$\begin{aligned} \text{CASHIND}_{i,t} = & \beta_0 + \beta_1 \text{CASHIND}_{i,t-1} + \beta_2 \text{LSBLOCK1}_{i,t} + \beta_3 \text{COALITION}_{i,t} + \beta_4 \text{DTRUST}_i \\ & + \beta_5 \text{DTRUST}_i \times \text{COALITION}_{i,t} + \gamma \text{CONTROLS}_{i,t} + \lambda_i + \zeta_t + \delta_s + \theta_p + \varepsilon_{i,t} \end{aligned} \quad (7)$$

The results (model 5 of Table 5) suggest, once again, that the level of social trust moderate the effect of the internal characteristics of the companies in the accumulation of cash holdings. Specifically, the contestability effect is substantially less relevant in low- trust countries -0.0326 (-0.1559 + 0.1233) while in the other countries is -0.1559. Although this result did not support H7 it is consistent with those obtained for the blockholder effect in models 2 and 3 of Table 5

5.3. SOME ROBUSTNESS CHECKS

We use, as alternative definitions of firm cash holdings, the ratio of the firm's cash and short-term investments divided by its book value total assets (Chen et al., 2015; Anderson and Hamadi, 2016); and the log of the ratio of the firm's cash and short-term investments divided by net assets (Dittmar et al., 2003). The results²⁴ remained very similar to the ones we obtained using industry adjusted ratio of cash holdings to net assets.

We next check the robustness of our results to two different measures of trust. Specifically, we re-estimate the models of Tables 4, 5 and 6 following the data of

²³ COALITION_{i,t} is the ratio of the sum of the control rights held by the second and third largest shareholders to the sum of the control rights held by the first, second, and third largest shareholders (Santos et al., 2014).

²⁴ The regressions are available upon request.

Xie and Xin (2015) and with data taken from OECD Social Indicators²⁵, concretely the percentage of people reporting high trust in others. Results not presented show that these alternative values of trust did not significantly change our results.

We also explore if there are cross-firm variations in the effect of trust on cash holdings. With this objective we construct a set of dummy variables (DYOUNG_{i,t}, DSMALL_{i,t}, DLTANG_{i,t}, DLDEBT_{i,t}, DLCAPEX_{i,t} and DLNWC_{i,t}, which are dummy variables where the value of 1 is assigned respectively to companies with the variables AGE_{i,t}, SIZE_{i,t}, TANG_{i,t}, DEBT_{i,t}, CAPEX_{i,t} and NWC_{i,t} in the bottom tercile in this country each year and zero otherwise). Our results²⁶ allow us to conclude that with great confidence that the characteristics of the companies of sample are not responsible of our results.

Then, we test the validity of our results analyzing some more homogeneous subsamples as a good way of testing the validity of our results. In order to test this, we first tested our first model for a sample in which we excluded Greece, Italy and Spain [regression (1) of Table A.1]. All of these countries are low-trust countries (the average of the variable TRUST_i of these countries is 0.266 while the sample mean is 0.365), as well as countries where the protection of shareholders' rights is less effective (the average of the variable SCORE_i of these countries is 1.936 while the sample mean is 3.470)²⁷. Second, we tested our first model for a sample in which we excluded United Kingdom [regression (2) of Table A.1]. Third, we tested our model for a sample in which we excluded France²⁸ [regression (3) of Table A.1]. We conclude that a specific subsample of firms that belong to low-trust countries, firms located in the United Kingdom or firms that belong to the country (France) in which there seems to be a higher preference for the accumulation of cash holdings does not moderate our results.

We also check for a model [regression (4) of Table A.1] in line with the research of Chang and Noorbakhsh (2009). In this case we replace the SCORE_i variable with the absolute deviation of the variable SCORE_i relative to its expected value (orthogonal SCORE_i). The expected value of variable SCORE_i was obtained with this model: $SCORE_i = \beta_0 + \beta_1 TRUST_i + \epsilon_{i,t}$. As can be observed, both the coefficient and the statistical significance of the new variable orthogonal SCORE_i are exactly those obtained in model 1 of Table 4. In relation to the variable TRUST_i this maintains the signal and the coefficient in absolute value is even greater.

Next, we explore a model without the variable SCORE_i but with a variable CG Index constructed by Griffin et al. (2018). The literature provides mixed evidence on the relation between corporate governance and cash holdings. Opler et al. (1999) and Chen (2008), for example, find no significant relationship between cash

²⁵ Wave 6 (2010-13) of the World Values Survey for Germany, Spain, Sweden. Wave 4 of the European Values Survey (2008-10) for Finland, France, United Kingdom, Greece, Italy, Norway and Switzerland.

²⁶ The regressions are available upon request.

²⁷ Existing literature suggests that the discretionary nature of investment is greater when shareholder protection is poor and firms tend to hold excess cash (Dittmar et al., 2003; Pinkowitz et al., 2006).

²⁸ In this case the rationale is to test a sample without the country that apparently further favors our evidence. France is simultaneously the country with the lowest TRUST_i (0.23) and with the highest average of cash holdings (0.135).

holdings and corporate governance. Griffin et al. (2018) find, across countries, evidence of a negative and statistically significant relationship between the variable CG index and the cash accumulation. Finally, Harford et al. (2008) for US firms show a positive relationship between governance and cash holding. According to the results of Harford et al. (2008) we also find [regression (5) of Table A.1] a positive correlation between cash accumulation and CG Index (0.0580, t- stat. of 2.17). More relevant is the maintenance of the negative correlation between trust and cash holdings as well as the statistical significance of the coefficient of the variable TRUST_i.

Finally, we test if some dimensions of a country's culture that have demonstrated in recent research a remarkable ability to explain the cash holding policy – in addition to be related to trust: individualism (Chen et al., 2015); uncertainty avoidance (Chang and Noorbakhsh, 2009; Chen et al., 2015; Breuer et al., 2017); ambiguity Aversion (Breuer et al., 2017); masculinity (Chang and Noorbakhsh, 2009), and long-term orientation (Chang and Noorbakhsh, 2009). With this propose we test a) a model in which we add the variables uncertainty avoidance, ambiguity aversion and power distance [regressions (6) of Table A.1]; b) a model in which we add the variables individualism and ambiguity aversion [regression (7) of Table A.1]; c) a model in which we add the variables individualism, ambiguity aversion and long-term orientation [regression (8) of Table A.1]; finally a model in which we add the variables individualism, ambiguity aversion, long-term orientation and masculinity [regression (9) of Table A.1]. From these models we can conclude that our results for the variable social trust are not affected by the absence of other cultural variables. Finally, it is noted that with the add cultural variables we obtain results that confirm the previous research (Breuer et al., 2017; Chen et al., 2015; Chang and Noorbakhsh, 2009; Breuer et al., 2017).

6. CONCLUSION

Using a sample of 741 non-financial listed firms over the 2009–2014 period, our paper extends the literature about the relation of social trust and cash holdings of European firms. We are the first to document this relation while addressing concerns about the unobservable heterogeneity, the potential endogeneity of the variables and the consideration of dynamic models.

We show that trust plays an important role in shaping cross-country variation in corporate cash holding policy. We find that firms in more trusting countries hold significantly less cash according to precautionary savings hypothesis. Our results are consistent with the view that firms located in high-trust countries reveal a lower concern with the accumulation of cash holdings insofar as they have lesser concerns about their financing because trust decreases information asymmetry between managers and shareholders and increases the supply of capital, reduces the costs of raising equity and facilitates access to trade credit. This result is robust to several robustness checks. For example, this result hold when we add more cultural variables, or when we explore some more homogeneous subsamples. In addition, our results for the other cultural variables confirm previous empirical evidence and therefore the singularity of our results only occurs in the variable trust.

We also find that firms located in countries with weaker social trust show low sensitivity both to risk and to abnormal profitability than companies located in other

countries. That is: (i) the positive effect of cash flow volatility on corporate cash holdings is less pronounced in countries with weaker social trust. This result is consistent with the agency hypothesis that predicts that shareholders in countries with low levels of social trust are less likely to believe that managers are trustworthy and thus are more concerned about moral hazard or outright expropriation by managers; (ii) our empirical evidence for the variable that measures the effect of abnormal profitability on the accumulation of cash holdings suggests that managers and shareholders in countries with low levels of social trust are so constrained by the difficulties in attracting new investors that even when companies are more profitable than competitors, they still do not diminish their concern to retain internally generated cash flows in order to secure financing of future investment opportunities. The fact that the policy of cash holdings is more rigid in low-trust countries is also a consequence of the blockholders are more concerned about managerial moral hazard in these countries which is associated with the fact that the former attribute less credibility to the information provided by the latter.

When we explore the ownership effect, our empirical evidence confirms that the presence of blockholders reduce corporate misbehavior and affect managers' flexibility and decisions related to corporate cash holdings. However, in countries with lower social trust the smaller availability of external capital at potentially higher costs increases firms' precautionary motive for which determines a signal change of the coefficient of the dominant blockholder. In sum, we can say, for European firms, that low (higher) levels of social trust and consequent more (less) difficulties in financing new investment opportunities seems to condition more the behavior of the blockholders than the severity of the problems of agency with the managers that we knew are also function of the level of social trust. We also report evidence that the blockholder effect becomes positive, when their ownership block becomes sufficiently large to fully control the firm, either as a result of the cost of under-diversification wealth, or because the liquid assets are much more easily turned into private benefits than other assets. Finally, we find that the interests of the second and third blockholders reinforce the negative relationship between ownership concentration and the accumulation of cash holdings and this effect is substantially more significant in high-trust countries.

This paper has a big practical utility and provides guidelines to the literature on the "Trust and Finance" of cross-country differences in firm cash holdings suggesting that specially in low-trust countries policymakers should have greater concern in developing policies that facilitate access to credit and to reinforce concerns about improving corporate governance that minimize the emergence of agency problems. Besides, our results suggest that countries, can improve the profitability of the firms fostering more trust in the society insofar as, as literature claim, this cultural dimension shows a negative correlation with the investment in low yield assets.

We expect that this paper provides guidelines to the firms, governments, stakeholders, etc., helping to the firms to make better decision on cash holdings policy especially in a framework of low-trust countries. Future research could further our understanding of the effect of trust on cash holdings by extending our analysis considering the interaction between social trust, organizational trust and corporate governance.

REFERENCES

- AHERN, K.R., DAMINELLI, D., FRACASSI, C., 2015. Lost in translation? The effect of cultural values on mergers around the world. *Journal of Financial Economics* 117, 165–189.
- AIKEN, L.S., WEST, S.G., 1991. *Multiple regression: Testing and interpreting interactions*. Newbury Park: Sage.
- ALMEIDA, H., CAMPELLO, M., WEISBACH, M.S., 2004. The cash flow sensitivity of cash. *Journal of Finance* 59, 1777–1804.
- ANDERSON, R.W., HAMADI, M., 2016. Cash holding and control-oriented finance. *Journal of Corporate Finance* 41, 410–425.
- ANDERSON, R.C., REEB, D.M., 2003. Founding family ownership and firm performance: Evidence from the S&P 500. *Journal of Finance* 58, 1301–1328.
- ARELLANO, M., BOND, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application of employment equations. *Review of Economic Studies* 58, 277–297.
- ARELLANO, M., BOVER, O., 1995. Another look at the instrumental variable estimation of error component models. *Journal of Econometrics* 68, 29–52.
- ARROW, K.J., 1974. *The Limits of Organization*. New York: WW Norton & Company.
- Aslan, H., Kumar, P., 2012. Strategic Ownership Structure and the Cost of Debt. *The Review of Financial Studies* 25, 2257–2299.
- ATTIG, N., GUEDHAMI, O., MISHRA, D., 2008. Multiple large shareholders, control contests and implied cost of equity. *Journal of Corporate Finance* 14, 721–737.
- ATTIG, N., GHOUL, S.E, GUEDHAMI, O., RIZEANU, S., 2013. The governance role of multiple large shareholders: evidence from the valuation of cash holdings. *Journal of Management and Governance* 17, 419–451.
- BARNEY, J.B., HANSEN, M.H., 1995. Trustworthiness as a Source of Competitive advantage. *Strategic Management Journal* 15, 175–190.
- BATES, T., KAHLE, K., STULZ, R., 2009. Why do U.S. firms hold so much more cash than they used to? *Journal of Finance* 64, 1985–2021.
- BATES, T.W., CHANG, C.H., CHI, J.D., 2018. Why Has the Value of Cash Increased Over Time? *Journal of Financial and Quantitative Analysis* 53, 749–787.
- BEGENAU, J., PALAZZO, D., 2018. Firm Selection and Corporate Cash Holdings. Working Paper No. 16-130, Harvard Business School Finance.
- BEN-NASR, H., BOUBAKER, S., ROUATBI, W., 2015. Ownership structure, control contestability, and corporate debt maturity. *Journal of Corporate Finance* 35, 265–285.
- Bennedsen, M., Wolfenzon, D., 2000. The balance of power in closely held corporations. *Journal of Financial Economics* 58, 113–139.
- BENNOURIA, M., CHTIOUI, T., NAGATIC, H., NEKHILI M., 2018. Female board directorship and firm performance: What really matters? *Journal of Banking and Finance* 88, 267–291.
- BERNILE, G., BHAGWAT, V., RAU, P.R., 2017. What Doesn't Kill You Will Only Make You More Risk-Loving: Early-Life Disasters and CEO Behavior. *Journal of Finance* 72, 167–206.
- BIGELLI, M., SÁNCHEZ-VIDAL, J., 2012. Cash holdings in private firms. *Journal of Banking & Finance* 36, 26–35.
- BLOCH, F., HEGE, U., 2001. Multiple large shareholders and control contests. Working Paper, Aix Marseille University.

BLUNDELL, R., BOND, S., 1998. Initial conditions and comoment restrictions in dynamic panel data models. *Journal of Econometrics* 87, 115–143.

BOTTAZZI, L., DA RIN, M., HELLMANN, T., 2016. The importance of trust for investment: Evidence from venture capital. *The Review of Financial Studies* 29, 2283–2318.

BOUBAKER, S., DEROUICHE, I., NGUYEN, D.K., 2015. Does the board of directors affect cash holdings? A study of French listed firms. *Journal of Management and Governance* 19, 341–370.

BOUBAKER, S., NGUYEN, P., ROUATBI, W., 2016. Multiple Large Shareholders and Corporate Risk-taking: Evidence from French Family Firms. *European Financial Management* 22, 697–745.

BURKART, M., PANUNZI, F., 2006. Agency conflicts, ownership concentration, and legal shareholder protection. *Journal of Financial Intermediation* 15, 1–31

BREUER, W., RIEGER M.O.; SOYPAK, K.C., 2017. Corporate cash holdings and ambiguity aversion. *Review of Finance* 21, 1933–1974.

BRICK, I.E., LIAO, R.C., 2017. The joint determinants of cash holdings and debt maturity: the case for financial constraints. *Review of Quantitative Finance and Accounting* 48, 597–641.

CAMPELLO, M., GRAHAM, J.R., CAMPBELL R.H., 2010. The Real Effects of Financial Constraints: Evidence from a Financial Crisis. *Journal of Financial Economics* 97, 470–487.

CARLIN, B., DOROBANTU, F., VISWANATHAN, S., 2009. Public trust, the law, and financial investment. *Journal of Financial Economics* 92, 321–341.

CHAMI, R., FULLENKAMP, C., 2002. Trust and efficiency. *Journal of Banking and Finance* 26, 1785–1809.

CHANG, K., NOORBAKHS, A., 2009. Does national culture affect international corporate cash holdings? *Journal of Multinational Financial Management* 19, 323–342.

CHEN, Y., 2008. Corporate Governance and Cash Holdings: Listed New Economy versus Old Economy Firms. *Corporate Governance: An International Review* 16, 430 – 442.

CHEN, Y., DOU, P.Y., RHEE, S.G., TRUONG, C., VEERARAGHAVAN, M., 2015. National culture and corporate cash holdings around the world. *Journal of Banking and Finance* 50, 1–18.

CHUI, A., TITMAN, S., WEI, K., 2010. Individualism and momentum around the world. *Journal of Finance* 65, 361–392.

CLINE, B.N., WILLIAMSON, C.R., 2016. Trust and the Regulation of Corporate Self-Dealing. *Journal of Corporate Finance* 41, 572–590.

DEMSETZ, H., 1983. The structure of ownership and the theory of the firm. *Journal of Law and Economics* 26, 375–390.

DITTMAR, A., MAHRT-SMITH, J., SERVAES, H., 2003. International corporate governance and corporate cash holdings. *Journal of Financial and Quantitative Analysis* 38, 111–133.

DITTMAR, A.K., MAHRT-SMITH, J., 2007. Corporate governance and the value of cash holdings. *Journal of Financial Economics* 83, 599–634.

DROBETZ, W., GRUNINGER, M.C., HIRSCHVOGL, S., 2010. Information asymmetry and the value of cash. *Journal of Banking and Finance* 34, 2168–2184.

DUARTE, J., SIEGEL S., YOUNG, L., 2012. Trust and credit: the role of appearance in peer-to-peer lending. *Review of Financial Studies* 25, 2455–2484.

DUCHIN, R., 2010. Cash Holdings and Corporate Diversification. *Journal of Finance* 65, 955–992.

- DUDLEY, E., ZHANG, N., 2016. Trust and corporate cash holdings. *Journal of Corporate Finance* 41, 363–387.
- DUDLEY, E., WANG, J., ZHANG, B., ZHANG, N., 2017. The equity price of societal capital. Working Paper.
- DURÁN, M., LOZANO, M. B., YAMAN, S., 2016. Is Family Control Relevant for Corporate Cash Holding Policy. *Journal of Business Finance and Accounting* 43, 1325–1360.
- FACCIO, M., LANG, L.H.P., YOUNG, L., 2001. Dividends and Expropriation. *American Economic Review* 91, 54–78.
- FACCIO, M., LANG, L., 2002. The Ultimate Ownership of Western European Corporations. *Journal of Financial Economics* 65, 365–395.
- FAMA, E.F., JENSEN, M.C., 1983. Separation of Ownership and Control. *Journal of Law and Economics* 26, 301–325.
- FAMA, E.F., FRENCH, K.R., 2006. Profitability, investment and average returns. *Journal of Financial Economics* 82, 491–518.
- FERNANDES, N., GONENC, H., 2016. Multinationals and cash holdings. *Journal of Corporate Finance* 39, 139–154.
- FERREIRA, M.A., VILELA, A., 2004. Why Do Firms Hold Cash? Evidence from EMU Countries. *European Financial Management* 10, 295–319.
- FERRIS, S. P., JAVAKHADZE, D., RAJKOVIC, T., 2017. The international effect of managerial social capital on the cost of equity. *Journal of Banking and Finance* 74, 69–84.
- FLANNERY, M.J., HANKINS, K.W., 2013. Estimating dynamic panel models in corporate finance. *Journal of Corporate Finance* 19, 1–19.
- FRÉSARD, S., SALVA, C., 2010. The value of excess cash and corporate governance: Evidence from US cross-listings. *Journal of Financial Economics* 98, 359–384.
- FUKUYAMA, F., 1995. *Trust: Societal virtues and the creation of prosperity*. Free Press, New York, NY.
- GAMBETTA, D., 1988. Can We Trust Trust? in D. Gambetta (ed.) *Trust. Making and Breaking Cooperative Relations*. New York: Basil Blackwell, 213–237.
- GAO, H., HARFORD, J., LI, K., 2013. Determinants of corporate cash policy: Insights from private firms. *Journal of Financial Economics* 109, 623–639.
- GOERGEN, M., RENNEBOOG, L., 2001. Investment Policy, Internal Financing and Ownership Concentration in the UK. *Journal of Corporate Finance* 7, 257–284.
- GOMES, A., NOVAES, W., 2006. Sharing of control versus monitoring as corporate governance mechanisms. Working Paper, Washington University in St. Louis.
- GRIFFIN, D.W., GUEDHAMI, O., LI, K., CHUCK C.Y.K., SHAO, L., 2018. National Culture and the Value Implication of Corporate Governance. *Journal of Law, Finance, and Accounting* 3, 333–372.
- GUIISO, L., SAPIENZA, P., ZINGALES, L., 2008. Trusting the stock market. *Journal of Finance* 63, 2557–2600.
- GUIISO, L., SAPIENZA, P., ZINGALES, L., 2009. Cultural biases in economic Exchange. *Quarterly Journal of Economics* 124, 1095–1131.
- GUIISO, L., SAPIENZA, P., ZINGALES, L., 2016. Long-term persistence. *Journal of the European Economic Association* 14, 1401–1436.
- GUPTA, A., RAMAN, K., CHENGUANG, S., 2018. Social capital and the cost of equity. *Journal of Banking and Finance* 87, 102–117.
- HANSEN, L.P., 1982. Large sample properties of generalized method of moment's estimators. *Econometrica* 50, 1029–1054.

- HARFORD, J., MANSI, S., MAXWELL, W., 2008. Corporate governance and firm cash holdings in the US. *Journal of Financial Economics* 87, 535–555.
- HARFORD, J., KLASA, S., MAXWELL, W., 2014. Refinancing risk and cash holdings. *Journal of Finance* 69, 975–1012.
- HASAN, I., HOI, C. H., WU, Q., ZHANG, H., 2017. Social Capital and Debt Contracting: Evidence from Bank Loans and Public Bonds. *Journal of Financial and Quantitative Analysis* 52, 1017–1047.
- HAUSHALTER, D., KLASA, S., MAXWELL, W., 2007. The influence of product market dynamics on risk management policies. *Journal of Financial Economics* 84, 797–825.
- HILARY, G., HUANG, S., 2016. Trust and contracting. Working paper, Georgetown University and Singapore Management University.
- HOLDERNESS, C.G., 2017. Culture and the ownership concentration of public corporations around the world. *Journal of Corporate Finance* 44, 469–486.
- HUANG, Y., ELKINAWY, S., JAIN, P.K., 2013. Investor protection and cash holdings: Evidence from US cross-listing. *Journal of Banking and Finance* 37, 937–951.
- HUANG, M., LI, P., MESCHKE F., GUTHRIE, J., 2015. Family Firms, Employee Satisfaction, and Corporate Performance. *Journal of Corporate Finance* 34, 108–127.
- HUANG, K., SHANG, C., 2019. Leverage, debt maturity, and social capital. *Journal of Corporate Finance* 54, 26–46.
- KALE, S.H., BARNES, J.W., 1992. Understanding the Domain of Cross-National Buyer-Seller Interactions. *Journal of International Business Studies* 23, 101–132.
- KAUFMANN, D., KRAAY, A., MASTRUZZI, M., 2009. Governance matters VIII: Aggregate and individual governance indicators 1996–2008. Washington, DC: The World Bank.
- KIM, C., MAUER, D., SHERMAN, A., 1998. The determinants of corporate liquidity: Theory and evidence. *Journal of Financial and Quantitative Analysis* 33, 335–359.
- KING, M.R.; SANTOR, E., 2008. Family values: Ownership structure, performance and capital structure of Canadian firms. *Journal of Banking and Finance* 32, 2423–2432.
- KNACK, S., KEEFER, P., 1997. Does societal capital have an economic payoff? A cross-country investigation. *Quarterly Journal of Economics* 112, 1251–1288.
- JENSEN, M.C., MECKLING, W.H., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3, 305–360.
- JENSEN, M., 1986. Agency cost of free cash flow, corporate finance and takeovers. *The American Economic Review* 76, 323–329.
- JIANG, F., CAI, W., WANG, X., ZHU, B., 2018. Multiple large shareholders and corporate investment: Evidence from China. *Journal of Corporate Finance* 50, 66–83.
- JULIANE, B., BERARDINO, P., 2018. Firm Selection and Corporate Cash Holdings. Working Paper No. 16-130, Harvard Business School Finance.
- LA PORTA, R., LOPEZ-DE-SILANES, F., SHLEIFER, A., VISHNY, R., 1997. Trust in large organizations. *American Economic Review* 87, 333–338.
- LA PORTA, R., LOPEZ, F., SHLEIFER, A., VISHNY, R.W., 2000. Investor Protection and Corporate Governance. *Journal of Financial Economics* 58, 3–27.
- LA PORTA, R., LOPEZ-DE-SILANES, F. AND SHLEIFER, A., 2008. The Economic Consequences of Legal Origins. *Journal Economic Literature* 46, 285–332.
- LAEVEN, L., LEVINE, R., 2008. Complex ownership structures and corporate valuations. *Review of Financial Studies* 21, 579–604.
- LEI, J., QIU, J., WAN, C., 2018. Asset tangibility, cash holdings, and financial development. *Journal of Corporate Finance* 50, 223–242.

- LESMEISTER, S., LIMBACH, P., GOERGEN, M., 2018. Trust and Shareholder Voting. ECGI Working Paper Series in Finance.
- LEVINE, R., LIN, C., XIE, W., 2018. Corporate resilience to banking crises: The roles of trust and trade credit. *Journal of Financial and Quantitative Analysis* 53, 1441–1477.
- LINS, K.V., SERVAES, H., TAMAYO, A., 2017. Societal Capital, Trust, and Firm Performance: The Value of Corporate Societal Responsibility during the Financial Crisis. *Journal of Finance* 72, 1785–1824.
- LOZANO, M.B., DURÁN, R.F., 2017. Family control and adjustment to the optimal level of cash holding. *The European Journal of Finance* 23, 266–295.
- MAURY, B., PAJUSTE, A., 2005. Multiple controlling shareholders and firm value. *Journal of Banking and Finance* 29, 1813–1834.
- MINTON, B., SCHRAND, C., 1999. The Impact of Cash Flow Volatility on Discretionary Investment and the Costs of Debt and Equity Financing. *Journal of Financial Economics* 54, 423–460.
- MISHRA, D., 2011. Multiple large shareholders and corporate risk taking: Evidence from East Asia. *Corporate Governance: An International Review* 19, 507–528.
- MIGUEL A, PINDADO J, DE LA TORRE C., 2004. Ownership structure and firm value: New evidence from Spain. *Strategic Management Journal* 25, 1199–1207.
- MYERS, S., MAJLUF, N., 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* 13, 187– 221.
- NUNN, N., WANTCHEKON, L., 2011. The Slave Trade and the Origins of Mistrust in Africa. *American Economic Review* 101, 3221–3252.
- OPLER, T., PINKOWITZ, L., STULZ, R., WILLIAMSON, R., 1999. The determinants and implications of corporate cash holdings. *Journal of Financial Economics* 52, 3–46.
- OZKAN, A., OZKAN, N., 2004. Corporate cash holdings: An Empirical Investigation of UK Companies. *Journal of Banking and Finance* 28, 2103–2134.
- PAGANO, M., ROELL, A., 1998. The choice of stock ownership structure: agency costs, monitoring, and the decision to go public. *Quarterly Journal of Economics* 113, 187– 225.
- PALAZZO, D., 2012. Cash holdings, risk, and expected returns. *Journal of Financial Economics* 104, 162–185.
- PEVZNER, M., XIE, F., XIN, X., 2015. When Firms Talk, Do Investors Listen? The Role of Trust in Stock Market Reactions to Corporate Earnings Announcements. *Journal of Financial Economics* 117, 190–223.
- PINKOWITZ, L., STULZ, R., WILLIAMSON, R., 2006. Does the contribution of corporate cash holdings and dividends to firm value depend on governance? A cross-country analysis. *Journal of Finance* 61, 2725–2751.
- POUND, J., 1988. Proxy contests and the efficiency of shareholder oversight. *Journal of Financial Economics* 20, 237–265.
- RIDDICK, L.A., WHITED, T.M., 2009. The corporate propensity to save. *Journal of Finance* 64, 1729–1765.
- ROODMAN, D., 2009. A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics* 71, 135–158.
- SANTOS, M.S., MOREIRA, A.C., VIEIRA, E.S., 2014. Ownership concentration, contestability, family firms, and capital structure. *Journal of Management and Governance* 18, 1063– 1107.
- SCHAUTEN, M.B.J., DIJK, D.V., WAAL, J.P.V.D., 2013. Corporate governance and the value of excess cash holdings of large European firms. *European Financial Management* 19, 991–1016.

- SHLEIFER, A., VISHNY, R., 1986. Large Shareholders and Corporate Control. *Journal of Political Economy* 94, 461–488.
- SHLEIFER, A., VISHNY, R., 1997. A survey of corporate governance. *Journal of Finance* 52, 737–783.
- SMITH, J.D., 2016. US political corruption and firm financial policies. *Journal of Financial Economics* 121, 350–367.
- THOMSEN, S., PEDERSEN, T., 2000. Ownership structure and economic performance in the largest European countries. *Strategic Management Journal* 21, 689–705.
- WILLIAMSON, O.E., 1975. *Markets and Hierarchies*. New York: The Free Press.
- WILLIAMSON, O.E., 1993. Calculativeness, trust, and economic organization. *Journal of Law and Economics* 36, 453–486.
- WINDMEIJER, F., 2005. A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics* 126, 25–51.
- WU, W., FIRTH, M., RUI, O.M., 2014. Trust and the Provision of Trade Credit. *Journal of Banking and Finance* 39, 146–159.
- XIE, F., XIN, X., 2015. Can I trust you with my money? The role of societal trust in corporate cash policy. Working paper, Social Science Research Network.
- XIE, F., ZHANG, B., ZHANG, W., 2018. Trust, Incomplete Contracting, and Corporate Innovation. Working paper, Social Science Research Network.
- ZAK, P., KNACK, S., 2001. Trust and growth. *Economic Journal* 111, 295–321.
- ZHUANG, Y., 2017. Do Peer Firms Affect Corporate Cash Saving Decisions? Working paper.
- ZWIEBEL, J. 1995. Block investment and partial benefits of corporate control. *Review of Economic Studies* 62, 161–185

Table 1. Variable description.

This table reports variables used in the empirical analysis and a description of the calculation procedure.

Variables	Description
Dependent Variable	
CASHIND _{it}	Natural logarithm $[1 + (\text{Cash} \& \text{ cash equivalent}_t / \text{NA}_{it})]$, where NA_{it} is computed as total assets minus cash holdings. Natural logarithm of industry adjusted ratio of cash holdings to net assets. Industry-adjusted cash is the industry-median-adjusted cash ratio (Gao, Harford and Li, 2013).
CASH _{it}	Natural logarithm of cash and cash equivalent scaled by net assets (NA).
Country-level variables	
TRUST _{it}	Based on responses to the WVS question: Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? We recode the response to this question to 1 if a survey participant reports that most people can be trusted and 0 otherwise and then calculate the mean of the response in each country year. Higher index values correspond to higher trust. (Source: World Value Survey).
SCORE _{it}	This captures country-year specific level of investor protection. It is the first principal component of component of governance, regulatory quality, control of corruption, political stability, rule of law and voice and accountability as described in Kaufmann et al. (2009) and at http://info.worldbank.org/governance/wgi .
Firm-level variables	
CFV _{it}	Cash flow volatility, standard deviation of cash flow in previous three years.
RROA _{it}	It is a difference between the true value of the asset's profitability ($\text{ROA}_{it} = \text{EBIT}_{it} / \text{TA}_{it}$) and the value estimated by the model below. $\text{ROA}_{it} = \beta_0 + \beta_1 \text{DEBT}_{it} + \beta_2 \text{MATURITY}_{it} + \beta_3 \text{GROWTH}_{it} + \beta_4 \text{CASH}_{it} + \beta_5 \text{SIZE}_{it} + \beta_6 \text{RA}_{it} + \beta_7 \text{TANG}_{it} + \beta_8 \text{INVESTMENT}_{it} + \beta_9 \text{NWC}_{it} + \beta_{10} \text{LNAGE}_{it} + \beta_{11} \text{LSBLOCK1}_{it} + \beta_{12} \text{FAMILY}_{it} + \text{Year dummies} + \text{Country dummies} + \text{Industry dummies}$. All the variables are defined in Table 1, with the exception of the RA_{it} which is obtained as revenues to total assets.
LSBLOCK1 _{it}	Is the percentage of control rights held by the largest shareholder. The cutoff point to award the qualification blockholder is 10% of voting rights.
SQLSBLOCK1 _{it}	Is the square of the variable presented above.
COALITION _{it}	$(\text{LSBLOCK2}_{it} + \text{LSBLOCK3}_{it}) / (\text{LSBLOCK1}_{it} + \text{LSBLOCK2}_{it} + \text{LSBLOCK3}_{it})$, where LSBLOCK1_{it} , LSBLOCK2_{it} and LSBLOCK3_{it} are the control rights shares held respectively by the largest, second largest and third largest shareholders of the company.
CF _{it}	$(\text{NI}_{it} + \text{DEP}_{it}) / \text{TA}_{it}$ is the ratio of net income plus depreciation to total assets.
TOBINQ _{it}	$\text{LN}[(\text{TA}_{it} - \text{BVE}_{it} + \text{MVE}_{it}) / \text{TA}_{it}]$, where TA_{it} is the book value of total assets; BVE_{it} is the book value of equity and MVE_{it} is the market value of equity.
DEBT _{it}	$(\text{LTD}_{it} + \text{STD}_{it}) / \text{TA}_{it}$ where LTD_{it} is the long term debt; STD is the short term debt and TA_{it} is the book value of total assets.
MATURITY _{it}	$\text{STD}_s / (\text{STD}_s + \text{STD}_l)$ where LTD_{it} is the long term debt and STD_{it} is the short term debt.
SIZE _{it}	Logarithm transformation of the total assets. $\text{LN}(\text{Total assets}_{it})$.
TANG _{it}	$\text{TANG}_{it} = \text{FA}_{it} / \text{TA}_{it}$ where FA_{it} is the net book value of the tangible fixed assets and TA_{it} is total assets.
CAPEX _{it}	$(\text{FA}_{it} - \text{FA}_{it-1} + \text{DEP}_{it}) / \text{TA}_{it}$ where FA_{it} is the net book value of the tangible fixed assets; DEP_{it} is depreciation and amortization and TA_{it} is total assets
NWC _{it}	$\text{NWC}_{it} / \text{TA}_{it}$ is non-cash net working capital to total assets
GROWTH _{it}	$(\text{REV}_{it} - \text{REV}_{it-1}) / \text{REV}_{it-1}$ where REV is the revenue
AGE _{it}	$\text{LN}(\text{YEARS})$ where YEARS is the number of years since the firm began its activity

TABLE 2. Descriptive Statistics.

This table reports descriptive statistics for the cash holdings, culture and control variables. All variables are as defined in Table 1:

	OBS.	MEAN	SD	Min.	P2.5	P25	P50	P75	p97.5	Max.
CASH _{it}	4446	0.110	0.101	0.003	0.004	0.039	0.078	0.148	0.416	0.464
TRUST _i	4446	0.374	0.134	0.230	0.230	0.230	0.340	0.390	0.660	0.660
SCORE _i	4446	3.470	0.791	1.630	1.630	3.020	3.750	3.810	4.600	4.600
TOBINQ _{it}	4446	1.257	0.497	0.635	0.638	0.912	1.120	1.452	2.836	3.306
DEBT _{it}	4446	0.557	0.162	0.190	0.220	0.445	0.570	0.679	0.860	0.890
MATURITY _{it}	4446	0.317	0.309	0.000	0.000	0.046	0.226	0.501	1.000	1.000
SIZE _{it}	4446	19.854	1.921	16.950	16.973	18.287	19.526	21.170	24.200	24.218
TANG _{it}	4446	0.238	0.196	0.007	0.008	0.070	0.197	0.351	0.750	0.790
CF _{it}	4446	0.089	0.070	-0.078	-0.057	0.048	0.084	0.123	0.268	0.295
CAPEX _{it}	4446	0.060	0.071	-0.120	-0.076	0.020	0.048	0.090	0.256	0.297
NWC _{it}	4446	0.072	0.194	-0.360	-0.311	-0.059	0.059	0.197	0.491	0.540
CFV _{it}	4446	0.032	0.035	0.000	0.002	0.011	0.022	0.040	0.127	0.415
RROA _{it}	4446	0.006	0.039	-0.080	-0.081	-0.017	0.009	0.033	0.065	0.075
GROWTH _{it}	4446	0.041	0.156	-0.350	-0.286	-0.044	0.034	0.116	0.437	0.525
AGE _{it}	4446	44.697	36.720	6.000	6.000	18.000	31.000	58.000	144.000	160.000
LSBLOCK1 _{it}	4446	0.402	0.223	0.100	0.104	0.201	0.360	0.550	0.900	0.950
COALITION _{it}	3311	0.424	0.152	0.102	0.129	0.310	0.443	0.547	0.658	0.693

Table 3. Country-level summary statisticsThis table reports descriptive statistics for the TRUST_{it}, SCORE_i and CASH_{it}. All variables are as defined in Table 1.

	Sample	France	Greece	Spain	Italy	U. Kingdom	Germany	Switzerland	Finland	Sweden	Norway
Observations	100%	19.84%	7.56%	4.05%	3.24%	25.24%	21.86%	2.43%	5.26%	7.42%	3.10%
TRUST _i	0.374	0.23	0.23	0.29	0.32	0.35	0.36	0.46	0.58	0.66	0.70
SCORE _i	3.470	3.02	1.63	2.64	1.77	3.81	3.75	4.32	4.60	4.34	4.29
CASH _{it}											
MEAN	0.110	0.135	0.078	0.086	0.103	0.109	0.124	0.106	0.088	0.085	0.086
S.D.	0.101	0.110	0.081	0.095	0.088	0.101	0.107	0.079	0.071	0.089	0.087
Pct.5%	0.008	0.012	0.006	0.003	0.007	0.011	0.010	0.016	0.004	0.006	0.009
Pct.25%	0.039	0.059	0.022	0.026	0.047	0.038	0.044	0.048	0.034	0.031	0.032
Pct.50%	0.078	0.100	0.052	0.058	0.082	0.075	0.090	0.088	0.071	0.058	0.059
Pct.75%	0.148	0.178	0.106	0.103	0.134	0.153	0.172	0.144	0.128	0.104	0.105
Pct.95%	0.329	0.386	0.230	0.298	0.297	0.329	0.344	0.242	0.233	0.242	0.244

TABLE 4 – Trust and Cash Holdings. Moderating role of financial characteristics.

This table provides the estimated coefficients from the two-step robust system GMM estimator with Windmeijer (2005) corrected standard error. A detailed definition of all variables can be found in Table 1. We controlled time, sector and institutional effects. z_1, z_2, z_3 and z_4 are Wald tests for the joint significance of the estimated coefficients, the time effect, legal origin and sector effect, AR(i) is a serial correlation test of order i using residuals in first differences, asymptotically distributed as $N(0,1)$ under the null of no serial correlation. The Hansen test is a test of overidentifying restrictions, asymptotically distributed as χ^2 under the null hypothesis of no correlation between the instruments and the error term. Diff-in-Hansen is also a test distributed as χ^2 under the null hypothesis that the subset of instruments used in the level equations are not correlated with the error term. VIF (variance inflation factor) test the absence of multicollinearity. Figures in parentheses are t-statistics (t-statistics are based on robust, firm-clustered standard errors) while p-values are in brackets. *, ** and *** indicate statistical significance at 10, 5, and 1 percent levels respectively.

	(1)	(2)	(3)
<i>CASHND_{it}</i>	0.3911*** (0.7.19)	0.4144*** (6.20)	0.3199*** (3.84)
<i>TRUST_{it}</i>	-0.2523*** (-2.64)		
<i>CFV_{it}</i>	0.3379*** (2.41)	0.8963*** (3.95)	0.4420*** (3.06)
<i>DTRUST_{it}</i>		0.0386** (2.01)	0.0302* (1.71)
<i>DTRUST_{it}*CFV_{it}</i>		-0.9427*** (-3.32)	
<i>RROA_{it}</i>	-0.8454*** (-3.35)	-0.5203*** (-2.67)	-0.9505*** (-2.81)
<i>DTRUST_{it}*RROA_{it}</i>			0.6683** (2.34)
<i>LSBLOCK_{it}</i>	-0.1008** (-1.98)	-0.0885** (-2.11)	-0.0727* (-1.82)
<i>SCORE_{it}</i>	-0.0777** (-2.29)	-0.0006 (0.05)	-0.0154 (-1.62)
<i>CF_{it}</i>	0.7845*** (4.62)	0.6089*** (4.55)	0.6649*** (4.07)
<i>TOBINO_{it}</i>	0.1684*** (3.69)	0.0906** (1.99)	0.1392*** (2.78)
<i>DEBT_{it}</i>	-0.2639*** (-2.61)	-0.3593*** (-3.38)	-0.2837*** (-3.37)
<i>MATURITY_{it}</i>	-0.0792*** (-5.31)	-0.0729*** (-4.97)	-0.0641*** (-4.70)
<i>SIZE_{it}</i>	-0.0325*** (-3.50)	-0.0222** (-2.13)	-0.0275** (-1.97)
<i>TANG_{it}</i>	-0.1971*** (-2.35)	-0.1686** (-2.09)	-0.2137** (-2.18)
<i>CAPEX_{it}</i>	-0.1406*** (-4.13)	-0.1913*** (-5.06)	-0.1365*** (-3.33)
<i>NWC_{it}</i>	-0.4772*** (-7.01)	-0.4638*** (-6.36)	-0.4336*** (-7.21)
<i>GROWTH_{it}</i>	-0.0903** (-2.09)	-0.1052** (-2.48)	-0.0704* (-1.85)
<i>AGE_{it}</i>	0.0369*** (3.14)	0.0365*** (3.12)	0.0359*** (2.68)
Constant	1.1060*** (4.51)	0.4785*** (2.72)	0.5857** (2.22)
z_1	[0.000]	[0.000]	[0.000]
z_2	[0.000]	[0.000]	[0.000]
z_3	[0.000]	[0.000]	[0.000]
z_4	[0.000]	[0.000]	[0.000]
Number of firms	741	741	741
p-value for AR(1)	[0.000]	[0.000]	[0.000]
p-value for AR(2)	[0.767]	[0.312]	[0.677]
Hansen - J (p-value)	[0.793]	[0.884]	[0.475]
Diff-in-Hansen (p-value)	[0.918]	[0.753]	[0.450]
VIF(Mean/Max)	1.56/2.88	1.72/3.02	1.62/2.92

TABLE 5 – Trust and Cash Holdings. Moderating role of ownership structure

This table provides the estimated coefficients from the two-step robust system GMM estimator with Windmeijer (2005) corrected standard error. A detailed definition of all variables can be found in Table 1. We controlled time, sector and institutional effects. z_1, z_2, z_3 and z_4 are Wald tests for the joint significance of the estimated coefficients, the time effect, legal origin and sector effect; $AR(i)_1$ is a serial correlation test of order i using residuals in first differences, asymptotically distributed as $N(0,1)$ under the null of no serial correlation. The Hansen test is a test of overidentifying restrictions, asymptotically distributed as χ^2 under the null hypothesis of no correlation between the instruments and the error term. Diff-in-Hansen is also a test distributed as χ^2 under the null hypothesis that the subset of instruments used in the level equations are not correlated with the error term. VIF (variance inflation factor) test the absence of multicollinearity. Figures in parentheses are t-statistics (t-statistics are based on robust, firm-clustered standard errors) while p-values are in brackets. *, ** and *** indicate statistical significance at 10, 5, and 1 percent levels respectively.

	(1)	(2)	(3)	(4)	(5)
<i>CASHIND_{it}</i>	0.3695*** (5.26)	0.4451*** (8.18)	0.3149*** (4.31)	0.3620*** (6.51)	0.4860*** (10.09)
<i>TRUST_{it}</i>	-0.1963** (-2.31)		-0.3441*** (-3.40)	-0.3411*** (-3.65)	
<i>CFV_{it}</i>	0.4009*** (2.66)	0.3350** (2.51)	0.3478** (2.16)	0.4011** (2.43)	0.3009*** (2.81)
<i>RROA_{it}</i>	-0.8268*** (-3.32)	-0.5729** (-2.45)	-0.6268*** (-2.63)	-0.7669*** (-2.86)	-0.5805*** (-3.08)
<i>LSBLOCK1_{it}</i>	-0.1151*** (-2.72)	-0.1834*** (-2.60)	-0.1236** (-2.07)	-0.1727*** (-3.14)	-0.0952** (-2.01)
<i>SQSLBLOCK1_{it}</i>	0.2721*** (2.99)			0.2750*** (2.61)	
<i>DTRUST*LSBLOCK1_{it}</i>		0.2089** (2.33)			
<i>DTRUST_{it}</i>		0.1415*** (2.71)			0.1088** (1.97)
<i>COALITION_{it}</i>			-0.1429*** (-2.60)	-0.1390*** (-2.75)	-0.1559** (-2.00)
<i>DTRUST*COALITION_{it}</i>					0.1233* (1.71)
<i>SCORE_{it}</i>	-0.0178 (-1.43)	-0.0323*** (-2.66)	-0.0975** (-2.43)	-0.0068 (-0.49)	-0.0226* (-1.92)
<i>CF_{it}</i>	0.7382*** (4.18)	0.7180*** (4.63)	0.5729*** (3.17)	0.6910*** (4.04)	0.6717*** (5.72)
<i>TOBNO_{it}</i>	0.1360*** (3.12)	0.0904** (2.21)	0.1851*** (3.59)	0.1484*** (3.30)	0.0771** (2.12)
<i>DEBT_{it}</i>	-0.2120** (-2.23)	-0.1937** (-2.03)	-0.3033*** (-3.02)	-0.3105*** (-2.93)	-0.2782*** (-3.65)
<i>MAIORITY_{it}</i>	-0.0672*** (-4.73)	-0.0673*** (-4.59)	-0.0941*** (-3.52)	-0.0795*** (-5.46)	-0.0743*** (-5.90)
<i>SIZE_{it}</i>	-0.0247*** (-2.75)	-0.0234*** (-2.64)	-0.0315*** (-3.02)	-0.0212** (-2.15)	-0.0168** (-2.54)
<i>TANG_{it}</i>	-0.2510*** (-3.19)	-0.2272*** (-3.16)	-0.2494*** (-2.65)	-0.1668* (-1.77)	-0.1810*** (-2.65)
<i>CAPEX_{it}</i>	-0.1331*** (-3.69)	-0.2102*** (-6.99)	-0.1697*** (-3.81)	-0.1822*** (-4.57)	-0.2075*** (-6.75)
<i>NWC_{it}</i>	-0.4442*** (-6.21)	-0.4110*** (-5.97)	-0.5189*** (-6.75)	-0.5310*** (-7.77)	-0.4351*** (-7.02)
<i>GROWTH_{it}</i>	-0.0954** (-2.28)	-0.0338* (-1.78)	-0.0829* (-1.77)	-0.0603 (-1.23)	-0.0695** (-2.20)
<i>AGE_{it}</i>	0.0337*** (3.01)	0.0341*** (3.24)	0.0387*** (3.30)	0.0307*** (2.58)	0.0346*** (3.82)
Constant	0.5972*** (4.31)	0.5548*** (3.57)	1.3231*** (4.80)	0.6639*** (4.26)	0.4777*** (3.61)
z_1	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
z_2	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
z_3	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
z_4	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Number of firms	741	741	741	741	741
p-value for AR(1)	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
p-value for AR(2)	[0.902]	[0.885]	[0.474]	[0.529]	[0.688]
Hansen - J (p-value)	[0.779]	[0.769]	[0.657]	[0.797]	[0.996]
Diff-in-Hansen (p-value)	[0.946]	[0.866]	[0.879]	[0.629]	[0.995]
VIF(Mean/Max)	1.96/3.88	(1.60/2.55)	1.57/2.88	1.59/2.89	1.94/4.87

Table A.1 - Robustness tests

This table provides the estimated coefficients from the two-step robust system GMM estimator with Windmeijer (2005) corrected standard error. A detailed definition of almost all variables can be found in Table 1. The remaining variables are: (1) CGINDEX_{it} is a variable constructed by Griffin et al. (2017) from the firms covered by the MSCI World Index over the period 2006-2011. They use 72 questions and answers on governance attributes, which GMI groups into eight categories: (1) board accountability, (2) financial disclosure and internal controls, (3) shareholder rights, (4) remuneration, (5) the market for corporate control, (6) corporate behavior – employee relationship, (7) corporate behavior – environment, and (8) corporate behavior – reputation; (2) UAI is Hofstede's uncertainty-avoidance index. A higher score indicates a higher degree of uncertainty-avoidance; (3) AAVERSION, A higher score indicates a higher degree of ambiguity aversion; (4) PDI is Hofstede's cultural index on power distance. A higher score indicates a higher degree of power distance; (5) IDV is Hofstede's individualism index. A higher score indicates a higher degree of individualism; (6) LTO is Hofstede's cultural index on long-term orientation. A higher score indicates a higher degree of long-term orientation; (7) MAS is Hofstede's cultural index on masculinity. A higher score indicates a higher degree of masculinity. We controlled time, sector and institutional effects. z_1, z_2, z_3 and z_4 are Wald tests for the joint significance of the estimated coefficients, the time effect, legal origin and sector effect; AR(i) is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0, 1) under the null of no serial correlation. The Hansen test is a test of overidentifying restrictions, asymptotically distributed as χ^2 under the null hypothesis of no correlation between the instruments and the error term. Diff-in-Hansen is also a test distributed as χ^2 under the null hypothesis that the subset of instruments used in the level equations are not correlated with the error term. VIF (variance inflation factor) test the absence of multicollinearity. Figures in parentheses are t-statistics (t-statistics are based on robust, firm-clustered standard errors) while p-values are in brackets. *, ** and *** indicate statistical significance at 10, 5, and 1 percent levels respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CASHIND _{it}	0.332*** (6.37)	0.271*** (3.90)	0.391*** (7.19)	0.391*** (7.19)	0.391*** (7.19)	0.391*** (7.19)	0.391*** (7.19)	0.391*** (7.19)	0.391*** (7.19)
TRUST _{it}	-0.4529*** (-4.81)	-0.2164*** (-2.49)	-0.3423*** (-3.43)	-0.3812*** (-3.47)	-0.3929*** (-3.47)	-0.3948*** (-3.48)	-0.2766*** (-3.03)	-0.2148*** (-2.39)	-0.2146*** (-2.34)
GRSCORE _{it}				-0.8777*** (-2.29)					
CGINDEX _{it}					0.0580** (2.17)				
UAI _{it}						0.2964*** (4.62)			
AAVERSION _{it}						-0.6838*** (-4.85)	-0.8117*** (-5.85)	-0.4533*** (-3.46)	-0.5986*** (-3.46)
PDI _{it}						-0.2273*** (-2.87)			
IDV _{it}							-0.1673*** (-3.72)	-0.1937*** (-4.20)	-0.2044*** (-4.29)
LTO _{it}								0.1657*** (2.34)	0.1657*** (2.34)
MAS _{it}									0.8088 (8.84)
SCORE _{it}	0.0478 (0.91)	-0.0491 (-1.71)	0.0223 (0.84)	0.3379*** (2.41)	0.3331** (2.32)	0.3407** (2.37)	0.0243 (0.45)	0.0543 (0.95)	-0.0035 (-0.37)
CFV _{it}	0.5071** (3.20)	0.4732*** (3.32)	0.3660*** (3.60)	0.3379*** (2.41)	0.3331** (2.32)	0.3407** (2.37)	0.3422** (2.56)	0.3628** (2.54)	0.2672** (2.38)
RROA _{it}	-0.8464*** (-2.86)	-0.8274*** (-2.22)	-0.6164*** (-2.86)	-0.8454*** (-3.23)	-0.8804*** (-3.23)	-0.8843*** (-3.23)	-0.8140*** (-3.23)	-0.9084*** (-3.23)	-0.9146*** (-3.42)
LSBLOCK _{it}	-0.3466*** (-3.16)	-0.2766*** (-3.15)	-0.2027** (-1.83)	-0.1008** (-1.98)	-0.3996*** (-2.06)	-0.1207** (-2.42)	-0.1215** (-2.49)	-0.1208** (-2.38)	-0.1160** (-2.24)
CF _{it}	0.7413*** (4.12)	0.6903*** (3.15)	0.7487*** (3.83)	0.7487*** (4.82)	0.6975*** (4.02)	0.8101*** (4.79)	0.7913*** (4.62)	0.8211*** (4.89)	0.8264*** (4.87)
TORNO _{it}	0.1374*** (2.20)	0.1381*** (2.45)	0.1130*** (2.96)	0.1684*** (3.49)	0.1509*** (3.31)	0.1479*** (3.13)	0.1422*** (3.31)	0.1464*** (3.31)	0.1407*** (3.11)
DEBT _{it}	-0.3222** (-2.42)	-0.2011* (-1.83)	-0.2808*** (-3.48)	-0.2493*** (-2.61)	-0.2866*** (-2.71)	-0.2899*** (-2.62)	-0.2790*** (-2.72)	-0.2513** (-2.50)	-0.2507** (-2.47)
MATURITY _{it}	-0.0676*** (-4.42)	-0.0811*** (-4.82)	-0.0389*** (-4.46)	-0.0792*** (-3.31)	-0.0777*** (-3.30)	-0.0780*** (-3.29)	-0.0789*** (-3.23)	-0.0787*** (-3.10)	-0.0782*** (-3.10)
SIZE _{it}	-0.0176** (-1.84)	-0.0223*** (-2.82)	-0.0229*** (-2.80)	-0.0223*** (-3.20)	-0.0300*** (-3.20)	-0.0340*** (-3.86)	-0.0311*** (-3.77)	-0.0319*** (-3.44)	-0.0311*** (-3.44)
TANG _{it}	-0.1047*** (-3.92)	-0.1070*** (-3.92)	-0.2009*** (-4.00)	-0.1891*** (-3.07)	-0.1464*** (-4.13)	-0.2318*** (-4.56)	-0.1921*** (-3.97)	-0.1883*** (-3.97)	-0.2213*** (-4.04)
NWC _{it}	-0.4843*** (-4.58)	-0.2320*** (-4.26)	-0.4164*** (-4.03)	-0.4772*** (-2.01)	-0.4776*** (-4.70)	-0.4785*** (-4.82)	-0.4701*** (-4.69)	-0.4682*** (-4.67)	-0.4711*** (-4.56)
GROWTH _{it}	-0.0961** (-2.07)	-0.0927** (-2.07)	-0.0237 (-1.37)	-0.0903** (-2.09)	-0.0623 (-1.39)	-0.0881** (-1.99)	-0.0878** (-1.92)	-0.0950** (-2.10)	-0.0934** (-2.09)
AGE _{it}	0.0304** (1.92)	0.0200* (1.52)	0.0271** (2.81)	0.0369*** (3.14)	0.0314*** (2.78)	0.0424*** (3.49)	0.0426*** (3.45)	0.0370*** (3.02)	0.0373*** (3.12)
Constant	0.1729*** (2.72)	0.1524*** (3.82)	0.1610*** (4.26)	0.1926*** (4.66)	0.1493*** (3.22)	0.1711*** (4.52)	0.1310*** (3.20)	0.1668*** (4.19)	0.1668*** (4.34)
z_1	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
z_2	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
z_3	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
z_4	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Number of firms	631	574	594	741	741	741	741	741	741
p-value for AR (1)	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
p-value for AR (2)	[0.192]	[0.647]	[0.176]	[0.787]	[0.654]	[0.791]	[0.716]	[0.816]	[0.826]
Hansen-J (p-value)	[0.971]	[0.611]	[0.420]	[0.793]	[0.704]	[0.827]	[0.789]	[0.736]	[0.783]
Diff-in-Hansen (p-value)	[0.924]	[0.808]	[0.393]	[0.918]	[0.906]	[0.913]	[0.860]	[0.833]	[0.837]
VIF(MeanMax)	(11.71.18)	(1.71.9.13)	(1.57.9.01)	1.41.2.88	1.47.2.88	2.02.4.91	1.92.5.14	2.08.5.30	2.25.5.30

TRADE POLICY IN RETROSPECT: THE GREAT RECESSION AND THE DETERMINANTS OF TARIFF AND ANTIDUMPING RESTRICTIONS IN ARGENTINA, BRAZIL AND MEXICO

ALEJANDRO D. JACOBO

Instituto de Economía y Finanzas/Centro de Investigaciones en Ciencias Económicas (CIECS-CONICET)/Universidad Nacional de Córdoba,
Av. Valparaíso s/n, Córdoba X5000IRV. Argentina

ILEANA R. JALILE

Instituto de Economía y Finanzas/Centro de Investigaciones en Ciencias Económicas (CIECS-CONICET)/Universidad Nacional de Córdoba,
Av. Valparaíso s/n, Córdoba X5000IRV. Argentina

e-mail: jacobo@eco.unc.edu.ar

Resumen

Este trabajo resume los determinantes macro y microeconómicos de las barreras arancelarias y antidumping (AD) en Argentina, Brasil y México utilizando datos antes y después de la Gran Recesión de 2008. En cuanto a las barreras arancelarias, los acuerdos institucionales parecen haber mantenido el control de las tarifas aplicadas después de la crisis, mientras que el impacto positivo del comercio intraindustrial revela la dependencia gubernamental de los ingresos arancelarios en ambos países sudamericanos. En cuanto a los determinantes de AD, la evidencia indica que Argentina ha aumentado aún más las investigaciones de AD después de la crisis como un complemento a las tarifas. Finalmente, la Gran Recesión no ha reforzado la relación entre los movimientos en el tipo de cambio y el inicio de un procedimiento de AD.

Palabras clave: Política comercial, barreras comerciales, antidumping.

Abstract

This paper summarizes the macro and microeconomic determinants of tariff and antidumping (AD) barriers in Argentina, Brazil and Mexico using pre- and post-2008 Great Recession trade and protection data. As to tariff barriers, institutional agreements appear to have kept applied tariff in control after the crisis, while the positive impact of intra-industry trade reveals the governmental dependence on tariff revenue in both Sud-American countries. As to AD determinants, the evidence indicates that Argentina have further increased AD investigations after the crisis as a complement to tariff. Finally, the Great Recession has not reinforced the relationship between movements in the exchange rate and the start of an AD procedure.

Key Words: Trade policy, trade barriers, antidumping.

Área o Eje Temático 1:

Economía Internacional

1. INTRODUCTION

Following the onset of the financial crisis in September 2008 and the subsequent “Great Trade Collapse” (Baldwin, 2009), several countries used trade policy instruments as part of their response to the Great Recession (GR). While there was not a large-scale resort to protectionism as in the Great Depression, during the GR several Latin American economies were “active” users of these instruments and trade barriers enacted by Argentina, Brazil and, to a lesser extent, Mexico, have been shown to be particularly significant.

Although most of these trade barriers are now dismantled, a walk through 2008-2010 shows that Argentine trade barriers have become less and less about industries traditionally targeted by these measures—such as steel—and more and more about restrictions on Chinese exports in a variety of industries (Moore, 2011). Interestingly, the acceleration of Brazil trade barriers during the crisis appears to be somewhat uncorrelated with the performance of the Brazilian real economy (which according to the official statistics continued to grow), but probably related to an appreciation of the real with respect to the currency of Brazil’s trading partners. As to Mexico, AD measures remains concentrated on two countries, the USA and China, although the Mexican economy has diversified its trade over the last decade. In this case, while different countries have increased their share in Mexican trade, their role in Mexico’s larger AD picture has remains small (Robertson, 2011).

The protectionist response of these economies during the GR is like a puzzle and disentangling the underlying determinants of trade policy measures is an interesting exercise that helps stakeholders to better understand the political economy of trade policy in that time (Bown, 2011). To our knowledge, there is no empirical evidence on: (a) the effectiveness of bound rate commitments behind countries’ conduct during the crisis; (b) the significance of Intra-Industry Trade (IIT) as a source of public revenues via trade restrictions; (c) the relevance of global chains in dissuading governments for enacting trade measures on intermediate inputs; and (d) the relationship—if any— between currency movements and AD procedures.

Following Jacobo and Jalile (2013), this paper aims at addressing these questions. It summarizes the determinants of trade policy in Argentina and Brazil, and it extends the analysis to Mexico during the GR. The study also verifies if countries had changed their behaviour as a consequence of the 2008 financial crisis. For this purpose, it explores the determinants of Tariff Barriers and AD over the period 2002-2010 which covers the peak of the crisis.

As known, there is a vast theoretical and empirical literature analysing the determinants of trade protection in the economy. In recent decades, however, this literature has moved towards the “endogenous” trade policy determination and constitutes the core of the literature on the political economy of trade policy (Gawande and Krishna 2008). Following this literature, we use 6-digit Harmonized System (HS) tariff, non-tariff and trade data provided by World Integrated Trade Solution (WITS), Temporary Trade Barriers (TTB) and Global Trade Alert (GTA) databases. The level of disaggregated data allows us to take into account sectoral and partner countries differences that influence on trade protectionism. This strategy is not a novel one. Among other authors Olarreaga and Vaillant (2011)

and Gawande et al. (2011) have already analysed the determinants of trade policies using disaggregated data as we do. However, in comparison with the previous literature, we focus specifically on Argentina and Brazil, we add Mexico to the analysis, and we try to see if there is a change in the behaviour of these countries after the crisis with available data.

The rest of the paper proceeds as follows. Section 2 develops a simple model in which the presence of discriminatory policies such as tariff and AD in a particular sector from a specific country depends on macro and microeconomic determinants. Section 3 reports the results. Section 4 concludes.

2. THE DETERMINANTS OF TARIFF AND NON-TARIFF TRADE RESTRICTIONS

We firstly estimate a *Tariff Barrier* equation where dependent variable is the *Effectively Applied Tariff* defined as the lowest available tariff. If a preferential tariff exists, we use it as the effectively applied tariff; otherwise we use the Most Favoured Nation (MFN) applied tariff. In this equation, we include the usual macro and microeconomic determinants (Gawande et al. 2011; Olarreaga and Vaillant 2011).¹ The equation is as follows:

$$t_{g,p,t} = \alpha_1 (tbndprf_{g,p,t}) + \alpha_2 (iit_{g,p,t-1}) + \alpha_3 (VS_g) + \alpha_4 (VS1_g) + \alpha_g + \alpha_p + \alpha_t + \varepsilon_{g,p,t}$$

where $t_{g,p,t}$ represents the level of the *Effectively Applied Tariff* on good g , imported from partner p at time t ; $tbndprf_{g,p,t}$ is a composite measure of $tbnd$ and $tprf$ ($tbnd$ is the bound rate commitment at the WTO and $tprf$ is the preferential tariff rate) and represents the value of this variable on good g imported from partner p at time t ; $iit_{g,p,t-1}$ is a measure of intra-industry trade on good g imported from partner p at time $t-1$; VS_g and $VS1_g$ are measures of vertical specialization on product g ; α_g is an HS six-digit fixed effect; α_p is a partner fixed effect; and α_t is a time fixed effect.

The coefficient associated to the bound rate $tbndprf$ (α_1) measures influence of institutions. As known, countries make commitments in terms of the “ceiling” above which they promise not to raise their applied duty but do not in terms of “applied protection”. However, if a country decides to sign a Preferential Trade Agreement (PTA) the new effective bound on its tariff rate would be the preferential tariff rate ($tprf$). Following Gawande et al. (2011), the study defines a composite measure where $tbndprf = tprf$ whenever $tprf$ is applicable, or $tbndprf = tbnd$ otherwise. The coefficient is expected to be positive and small if the structure of GATT/WTO incentives keep applied tariff in check.

The coefficient α_2 captures the impact of IIT on the tariff barrier level. If tariffs in the countries are strategic as a source of government revenue one may expect a positive correlation between IIT and the dependent variable (Gawande et al. 2011). Vertical Specialization could be defined as production arrangements in which firms make final goods via multiple stages located in several countries. The literature points out that vertical specialization could have an impact on the tariff level. The study introduces two measures of vertical specialization: VS and VS1 (Hanson et

¹ Gawande and Krishna (2008) provide a short and accurate review of the literature.

al. 2003). VS is the share of imports in a sector that is used directly and indirectly in the country's own exports (i.e. embedded as intermediate inputs). VS1 is the share of a sector's exports used as intermediates by exporters in other countries. These two variables have been constructed in Daudin et al. (2011) using trade and input-output data from the Global Trade Analysis Project (GTAP) database and we use them following the methodology suggested by Jacobo and Jalile (2015).² While a positive coefficient in VS may indicate that the exporters are not powerful enough to overcome the governmental decision to raise revenues, a negative coefficient on VS1 can be interpreted as a global supply chain working against protectionism.

Other macroeconomic determinants of policy trade responses that may vary across years such as the level of activity, unemployment and institutional variables have been taken into account with the use of year fixed effects (Olarreaga and Vaillant 2011). The microeconomic determinants of trade policy instruments such as the concentration of the sectors, output or the extent to which workers are unionised remain constant during the period and our study controls them using product fixed effects.

Secondly, we estimate an AD equation where the dependent variable is the AD initiation. With regard to this equation, the determinants of Non-Tariff Barriers have also been extensively studied in the literature (Aggarwal 2004; Knetter and Prusa 2003; Prusa and Skeath 2002; Sabry 2000). We propose the following equation:

$$AD_{g,p,t} = \alpha_1(uv_{g,p,t-1}) + \alpha_2(m_{g,p,t-1}) + \alpha_3(VS_g) + \alpha_4(VS1_g) + \alpha_5(t_{g,p,t}) + \alpha_6(RBER_{p,t}) + \alpha_g + \alpha_p + \alpha_t + \varepsilon_{g,p,t}$$

where $AD_{g,p,t}$ is a dummy variable indicating the presence of an AD on good g imported from partner p at time t ; $uv_{g,p,t}$ is the unit value of good g imported from partner p at time t ; $m_{g,p,t}$ is the value of imports of good g imported from partner p at time t ; $t_{g,p,t}$ is the *Effectively Applied Tariff* on good g at time t ; VS_g and $VS1_g$ are measures of vertical specialization on product g ; $RBER_{p,t}$ is the real bilateral exchange rate with respect to partner's p currency at time t ; α_g is an HS six-digit fixed effect; α_p is a partner fixed effect; and α_t is a time fixed effect.

As microeconomic determinants that affect trade policy responses we consider the price and the value of imports which vary across partners, years and sectors. We postulate that the propensity to initiate an AD procedure would increase with larger imports ($\alpha_2 > 0$) and it is less likely to be found with higher unit prices ($\alpha_1 < 0$).

We include the vertical specialization (VS and VS1) measures. One expects that an increase in vertical specialization reduce protectionism in the reporting country whether local governments favour global supply chains. This means that AD initiations should be inversely related with vertical specialization measures. On the other hand, a positive coefficient on VS could be associated with the fact that exporters in the reporting countries are not powerful enough for fight against protectionism, while a positive coefficient on VS1 could indicate that exporters of partner countries are not lobbying against protectionism on local governments.

Among the most important macroeconomic determinants, the study includes MFN (or effectively applied tariff) rates and RBER. While the coefficient associated to

² Daudin generously provided us with the data.

tariff rate indicates the extent to which AD and tariff rates act as a complementary or substitute measure to trade policy, the sign of RBER coefficient can be ambiguous. Feinberg (1989) suggests that the coefficient should be positive as the depreciation of the local currency increase the probability of finding dumping, while Knetter and Prusa (2003) propose that the coefficient should be negative because a depreciation of the local currency does not provoke damage to the economy.

As in the tariff equation, we use year fixed effects to control for domestic macroeconomic determinants of policy trade responses that vary across years as well as for microeconomic determinants of trade policy. In both equations, we explain the presence and level of trade barriers in a 6-digit HS product imported from a particular country in a given year. This disaggregation is required because tariff and non-tariff barriers are determined at the product level.

3. ESTIMATION AND RESULTS

The estimates from a baseline partner and year fixed effects model of applied bilateral tariffs are summarized in Table 3.1. In the model, the year fixed effect controls for any domestic macroeconomic change such as the level of economic activity or unemployment in the reporter countries. The partner fixed effect controls for any particular determinant of protection towards that partner that is time-invariant, as for example distance, institutional similitudes, as well as similarities in the comparative advantage. The model performs well.

The coefficient of 0.25 on *tbindprf* for Argentina indicates that if bound rate (adjusted for PTA agreements) increases 1 point Argentina's bilateral applied tariff increases 0.25 points. In general, the small coefficients associated to this variable are the rule in the table and they may indicate that WTO incentives kept applied tariffs in check. A similar explanation is found in Gawande et al. (2011).

Table 3.1
Baseline Model of Applied Bilateral Tariffs for
Argentina, Brazil and Mexico

	ARG	BRA	MEX
tBNDPRF	0.2502 *** <i>0.0013</i>	0.2867 *** <i>0.0011</i>	0.3006 *** <i>0.0008</i>
IIT	1.6420 *** <i>0.0519</i>	1.2547 *** <i>0.0353</i>	-0.3437 *** <i>0.0483</i>
VS	10.7300 *** <i>0.1151</i>	17.6481 *** <i>0.1689</i>	-13.7267 *** <i>0.0753</i>
VS1	-10.4062 *** <i>0.1182</i>	-23.5130 *** <i>0.1001</i>	-42.9247 *** <i>0.1363</i>
N	405806	520806	631402
Partner FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R ²	0.3577	0.4189	0.5614

Notes: (1) Dependent variable is applied tariff; (2) tBNDPRF is the bound rate augmented by preferential rate when applicable; (3) Standard errors in italics; (4) *** p<0.01; (5) Data pooled across 2002-2010.

The coefficient of 1.64 on IIT for Argentina indicates that a higher IIT is associated with an increase in Argentinean tariffs. This is quite the opposite of the prediction from intra-trade models that emphasize the additional welfare gains from expanding the varieties.³ Besides, the positive sign on IIT could indicate the dependence of Argentina on tariffs as a source of public revenues. Since much of the Argentinean trade is with PTA's associates more revenues mean higher tariffs on non-PTA partners, even if trade with them is two-way trade in similar goods. For Mexico, however, IIT has a negative coefficient that may indicate the additional welfare from expanding the variety in differentiated products. In this case, the gains from trade appear to overwhelm the revenues reasons for raising tariffs.

While measures of VS do not dissuade the use of tariff in Argentina and Brazil, it does deter their use in Mexico. Recall that the VS measure of vertical specialization is the share of imports in a sector that is used directly and indirectly in the country's own exports (i.e. embedded as intermediate inputs). So, while the exporters of countries included in the first club of nations are not powerful enough to overcome the need to raise revenues, the importance of exporters in Mexico is apparently significant.

The second vertical specialization measure (VS1) shows a negative coefficient across the table. This could be interpreted as a global supply chain against protectionism. The coefficients suggest that the governments are enthusiastic to enhance their exporters' interests by reducing tariffs on the inputs used by (upstream) home exporters in order to enhance their competitive position with

³ The results presented in Jørgensen and Schröder (2006) and Brander and Spencer (1984) could also explain the positive correlation we have found.

foreign users. The negative coefficients may also be taken as evidence for the idea that exporters in foreign countries may (politically) influence home tariffs since their competitiveness depends on the supply of cheap inputs from home producers.

Following Gawande et al. (2011), each variable is interacted with a post-crisis dummy to find out whether the relationships observed in Table 3.1 remained unaltered through the crisis or were fundamentally changed by it. The results are presented in Table 3.2.

Table 3.2
Explaining Applied Bilateral Tariff Before and After 2009 in
Argentina, Brazil and Mexico

	ARG	BRA	MEX
<i>t</i> BNDPRF	0.2436 *** <i>0.0014</i>	0.2707 *** <i>0.0011</i>	0.3307 *** <i>-12.4735</i>
IIT	1.8771 *** <i>0.0573</i>	1.3880 *** <i>0.0392</i>	-0.4970 *** <i>0.0556</i>
VS	11.0759 *** <i>0.1273</i>	12.5779 *** <i>0.1890</i>	-11.9952 *** <i>0.0868</i>
VS1	-10.9265 *** <i>0.1309</i>	-20.0695 *** <i>0.1121</i>	-39.6396 *** <i>0.1570</i>
<i>t</i> BNDPRFxI2009	0.0255 *** <i>0.0021</i>	0.0655 *** <i>0.0018</i>	-0.1147 *** <i>0.0014</i>
IITxI2009	-1.2729 *** <i>0.1294</i>	-0.4936 *** <i>0.0840</i>	0.5272 *** <i>0.1032</i>
VSxI2009	-1.7366 *** <i>0.2933</i>	23.2473 *** <i>0.4024</i>	-6.6868 *** <i>0.1680</i>
VS1xI2009	2.4124 *** <i>0.2865</i>	-15.8650 *** <i>0.2316</i>	-12.4735 *** <i>0.2992</i>
N	405806	520806	631402
Partner FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R-squared	0.3586	0.4270	0.5677

Notes: (1) Dependent variable is applied tariff; (2) *t*BNDPRF is the bound rate augmented by preferential rate when applicable; (3) Standard errors in italics; (4) *** p<0.01; (5) Data pooled across 2002-2010.

The positive and statistically significant coefficient on the interaction term *t*bndprfxI2009 in Argentina and Brazil indicates that these countries did not lower their tariffs, but they feel the pressure to raise them in the post-crisis period. In the case of Argentina, for example, the coefficient on *t*bndprf increased by 0.026 in 2009 over a pre-crisis coefficient of 0.24, signaling a readiness to increase tariffs up to the bound levels.

The coefficient on *IITxI2009* for Argentina is negative. However, taken into account the overall impact of IIT post-crisis on the level of the tariff (1.8771-1.2729), one may conclude that Argentinean public finances effectively depend on tariff revenues. The same conclusion may be applied for Brazil. We also observe that the overall impact of IIT on Mexico has changed after the crisis. In fact, while

before the crisis the theory emphasizing the additional welfare gains from expanding the varieties was verified, after the crisis the theory of tariff revenue dependency was applied.

As to the vertical specialization measures, the coefficient of VS1xl2009 shows large negative one for Mexico and Brazil. In the post-crisis period, the export sectors in Brazil's partner countries seem to have a strong influence on lowering their tariffs, particularly on products that the partners import from those countries for intermediate use.⁴ To a lesser extent, this source of anti-protectionism is also evident in Argentina.

Table 3.3
Applied Bilateral Tariff with Product Fixed Effect in
Argentina, Brazil and Mexico

	ARG	BRA	MEX
<i>t</i> BNDPRF	0.3738 ***	0.3587 ***	0.3939 ***
	<i>0.0008</i>	<i>0.0009</i>	<i>0.0006</i>
<i>t</i> BNDPRFx2009	0.0399 ***	0.0758 ***	-0.1093 ***
	<i>0.0009</i>	<i>0.0008</i>	<i>0.0009</i>
IIT	-0.0366	0.0068	-0.3247 ***
	<i>0.0275</i>	<i>0.0196</i>	<i>0.0365</i>
ITTxl2009	-0.4264 ***	-0.0038	0.6951 ***
	<i>0.0548</i>	<i>0.0381</i>	<i>0.0651</i>
N	403587	520806	631358
Partner FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Product	Yes	Yes	Yes
R-squared	0.3115	0.3337	0.4693

Notes: (1) Dependent variable is applied tariff; (2) *t*BNDPRF is the bound rate augmented by preferential rate when applicable; (3) Standard errors in italics; (4) *** p<0.01; (5) Data pooled across 2002-2010.

Table 3.3 presents the result of the estimation including good fixed effects. The coefficients associated with the institutional variable *t*bndprf do not present a significant change in comparison with the previous specification. However, one may see some changes on the overall impact of IIT on protectionism after the crisis. In fact, while a positive impact of IIT in the level of the tariff was the rule in the previous specification (indicating that weak tax system in these countries relies almost at all on tariff revenue), when considering product fixed effect this relation has changed. On this new approach, there is evidence that in Argentina the gains from trade in similar, but differentiated products appear to overwhelm the need to use tariff for revenues purposes.

⁴ A lower cost makes partners more competitive and, in turn, this situation increase the purchases from Brazilian suppliers and expand their exports.

Table 3.4
Conditional Logit Model of the Incidence of AD Initiations Before and After 2009
for Argentina Brazil and Mexico

	ARG	BRA	MEX
t	0.0444 ***	0.1059 ***	0.0229 ***
	<i>0.0186</i>	<i>0.0178</i>	<i>0.0042</i>
VS	3.5078 ***	6.6032 ***	3.7400 ***
	<i>1.1251</i>	<i>2.8009</i>	<i>1.0817</i>
VS1	-0.1454	3.5772 ***	4.3331 ***
	<i>1.2038</i>	<i>1.6331</i>	<i>1.5355</i>
RBER	-1.5047 ***	-2.2312 ***	0.0231
	<i>0.5875</i>	<i>0.8672</i>	<i>0.0658</i>
Imports	0.0000	0.0000 ***	0.0000
	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>
Unit Values	-0.0134	-14.0099 ***	-64.5921 ***
	<i>0.0240</i>	<i>7.2951</i>	<i>21.4922</i>
txl2009	0.0523 ***	-0.0089	-0.0033
	<i>0.0238</i>	<i>79.4899</i>	<i>0.0462</i>
VSxl2009	-5.4049 ***	0.8666	-5.8989
	<i>1.8031</i>	<i>17274.2700</i>	<i>4.7066</i>
VS1xl2009	0.2014	-1.5298	-4.7378
	<i>1.9595</i>	<i>10344.7600</i>	<i>6.5183</i>
Importsxl2009	0.0000	0.0000	0.0000
	<i>0.0000</i>	<i>0.0070</i>	<i>0.0000</i>
Unit Valuesxl2009	-0.0146	-13.9624	-45.8221
	<i>0.0559</i>	<i>49282.1500</i>	<i>102.7704</i>
RBERxl2009	1.2404 ***	-0.1363	-0.5507
	<i>0.4894</i>	<i>3340.1530</i>	<i>0.5213</i>
N	148284	125851	159138
Partner FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Notes: (1) Dependent variable is a binary variable indicating the presence of an AD initiations in a particular HS 6 digit sector; (2) Standard errors in italics; (3) *** p<0.01.

The study looks at the incidence of AD initiations using conditional logit models with partner, product and year fixed effects. Previous studies of trade defense measures have restricted their samples only to sectors in which these kinds of measures have taken place. In our study, we compare 6-digit HS commodities on which AD investigations occurred with the overwhelming number of cases in which these investigations do not exist.

Table 3.4 presents the results of estimating the *AD equation*. All the countries in the sample show a positive relationship between AD initiations and the tariff level. This could suggest that both measures are complementary. This relationship is only reinforced after the crisis in Argentina and it indicates that this country may have stepped-up AD investigations after the crisis as a complement to tariff barriers.

The coefficient on RBER is negative and statistically significant for Argentina and Brazil. This indicates that an appreciation of their currency against the currency of their trading partners makes an AD initiation more likely to occur. When this variable is evaluated in the post crisis period, the study finds that the coefficient has reduced in Argentina and remains the same in Brazil. Consequently, the crisis

has not reinforced the relationship between movements in the exchange rate on the probability of an initiation of an AD procedure.

The coefficients on VS are positive for all countries. For the post-crisis years, Argentina is the only country where a change in the relationship between VS and AD is detected. Specifically, this may indicate that Argentinean exporters are now more powerful in fighting against AD initiations over their imports.

As to VS1, the coefficient is positive for Brazil and Mexico. Recall that a negative sign on this variable may indicate that government favors global supply chains while a positive one could indicate that foreign exporters do not have political influence on the local economic policy.

While in Table 3.4 one may observe that the propensity to initiate an AD is positively related with the level of the tariff effectively applied on a particular product, it is important to consider that some problems of endogeneity may emerge. The strategy in our study is to control for 6-digit HS product-fixed effect. Our empirical approach assumes that the endogeneity problem could arise due to a non-observed variable that determines both AD initiations and the level of the tariff. Such non-observed variable could be the political strength of domestic producers of each 6-digit HS product. Therefore, controlling for product, year and partner fixed effects is our last estimation and we present the results of this specification in Table 3.5.

For Argentina, the most important determinant of the probability of an AD initiation is the *RBER*. It means that the propensity to initiate a trade defense measure in Argentina strongly depends on the level of appreciation of its currency against its partner's countries and that for years after 2008 this relationship has been reinforced. While prior to 2008 the relationship between the level of the tariff and the probability of initiate an AD procedure is not statistically different from zero, after crisis one can observe a complementarity between both measures of protectionism.

With regard to Brazil, Table 3.5 shows that the propensity to initiate an AD depends on the level of the tariff and the *RBER*. It indicates that tariff and non-tariff barriers are complementary and that the propensity to initiate an AD in Brazil depends on the level of appreciation of its currency against its partner's countries. Besides, the impact of these variables on the probability of initiating an AD remains the same after the crisis.

Table 3.5
Conditional Logit Model of the Incidence of Antidumping Initiations with Product
Fixed Effects for Argentina, Brazil and Mexico

	ARG	BRA	MEX
t	-0.0008 <i>0.0303</i>	0.1708 *** <i>0.0456</i>	0.1604 *** <i>0.0392</i>
RBER	-1.5824 *** <i>0.5957</i>	-2.6676 *** <i>0.9227</i>	0.0207 <i>0.0783</i>
Imports	0.0000 <i>0.0000</i>	0.0001 *** <i>0.0000</i>	0.0000 <i>0.0000</i>
Unit Values	-0.0052 <i>0.0067</i>	-1.8700 <i>4.4753</i>	-42.1161 *** <i>25.4968</i>
txl2009	0.0563 *** <i>0.0274</i>	-0.0409 <i>63.9757</i>	-0.0397 <i>0.0508</i>
Importsxl2009	0.0000 <i>0.0000</i>	0.0000 <i>0.0127</i>	0.0000 <i>0.0000</i>
Unit Valuesxl2009	-0.0025 <i>0.0349</i>	1.7309 <i>11457.6900</i>	-27.9655 <i>85.7151</i>
RBERxl2009	1.3088 *** <i>0.5224</i>	0.2594 <i>2865.8620</i>	-0.5714 <i>0.5071</i>
N	11831	5644	6911
Partner FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Product FE	Yes	Yes	Yes

Notes: (1) Dependent variable is a binary variable indicating the presence of an AD initiations in a particular HS 6 digit sector; (2) Standard errors in italics; (3) *** p<0.01.

In Mexico AD initiations and tariff appear to be complementary and the lower prices for product imported from partners are more likely to lead to AD initiation. Both effects are not reinforced after the crisis.

4. CONCLUDING REMARKS

This paper explores the macro and microeconomic determinants of tariff and AD barriers in Argentina, Brazil and Mexico using pre- and post-2008 GR trade and protection data. The study finds that institutional incentives appear to have kept applied tariff in control. In fact, in spite of that all countries have plenty of space to raise tariff, they did not strongly use it.

It also finds that IIT is associated with an increase in tariffs with the exception of Mexico. This could indicate that the countries strongly depend on tariff as a source of government revenue. After the crisis, the overall impact of IIT on tariff level is positive thus reinforces the dependence on tariff revenues.

The positive coefficients for Argentinean and Brazilian VS measures indicate that exporters of these countries are not powerful enough to avoid the increase in federal government revenues. The estimations show that the crisis did not change the relationship between the level of VS and the tariff. Thus, we observe some

heterogeneity across the countries since Mexican exporters were successfully in demanding protectionism.

The negative coefficient associated with the VS1 (i.e. the proportion of a sector's exports used as intermediates by exporters in other countries) suggests that governments are enthusiastic to favor their exporters by reducing tariffs on the inputs used by (upstream) home exporters in order to enhance their competitive position with foreign users. The negative coefficient could also support the idea that foreign exporters have influence in determining trade liberalization in the LAC analyzed.

As to AD determinants, tariff and non-tariff protectionist measures are complementary. The evidence for Argentina points out that this country may have further increased AD investigations after the crisis as a complement to tariff measures.

Finally, the coefficient on RBER is negative and significant for Argentina and Brazil. This indicates that an appreciation of their currency against the currency of their trading partners makes an AD initiation more likely to occur. When this variable is evaluated in the post-crisis period, the study finds that the coefficient has been reduced in Argentina and it remains the same in Brazil. Consequently, the crisis has not reinforced the relationship between movements of the exchange rate on the probability of an initiation of an AD procedure.

REFERENCES

- AGGARWAL, A. (2004). "Macroeconomic Determinants of Antidumping: A Comparative Analysis of Developed and Developing Countries. *World Development*, 32 (6), 1043-1057.
- BALDWIN, R. (2009). *The Great Trade Collapse: Causes, Consequences and Prospects*. London: Centre for Economic Policy Research. Available at <http://www.voxeu.org/index.php?q=node/4297>.
- BOWN, C. (2011). "Introduction". In *The Great Recession and Import Protection: The Role of Temporary Trade Barriers*, edited by Chad Bown, 1-55. London, CEPR and The World Bank.
- BOWN, C. (2010). "Taking Stock of Antidumping, Safeguards, and Countervailing Duties, 1990-2009". *World Bank Policy Research Working Paper* 5436, accessed April 12, 2012. http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2010/09/28/000158349_20100928091836/Rendered/PDF/WPS5436.pdf.
- BOWN, C. (2012). "Temporary Trade Barriers Database", Accessed February 12, 2012. <http://econ.worldbank.org/ttbd/>.
- BRANDER, J.; SPENCER B. (1984). "Tariff protection and imperfect competition". In *Monopolistic Competition and International Trade*, edited by Henryk Kierzkowski, New York, Oxford Economic Press.
- DAUDIN, G.; RIFFLART, C.; SCHWEISGUTH D. (2011). "Who Produces for Whom in the World Economy". *Canadian Journal of Economics*, 44 (4), 1403-1437.
- FEINBERG, R. (1989). "Exchange Rates and 'Unfair Trade'". *Review of Economics and Statistics*, 71 (4), 704-707.
- GAWANDE, K.; HOEKMAN B.; CUI, Y. (2011). "Determinants of Trade Policy Responses to the 2008 Financial Crisis", *World Bank Policy Research Working Paper*, 5862, accessed May 12, 2012. <http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-5862>.
- GAWANDE, K.; KRISHNA, P. (2008). "The Political Economy of Trade Policy: Empirical Approaches". In E. Choi and J. Harrigan *Handbook of International Trade*, edited by E. Choi

and James Harrigan, 213-250. Bodmin: Blackwell Publishing Limited.

HANSON, G.; MATALONI R.; SLAUGHTER, M. (2003). "Vertical Production Networks in Multinational Firms", National Bureau of Economic Research *Working Paper*, no. 9723, accessed May 12, 2012. <http://www.nber.org/papers/w9723.pdf>.

HOEKMAN, B. (2015). "Trade Policy: So Far so Good?". *Finanzas y Desarrollo*, accessed January 2015. <http://www.imf.org/external/pubs/ft/fandd/2012/06/pdf/hoekman.pdf>.

JACOBO, A.; JALILE, I. (2015). "Assessing the Evolution of Economic Integration in Latin America: Is MERCOSUR Passé?". In C. Díaz and J. Perote *Advances on International Economics*, 247-270, Newcastle upon Tyne, Cambridge Scholars Publishing.

JACOBO, A.; JALILE, I. (2013). "Analyzing Trade Policies: The Case of Contemporary Protectionism in MERCOSUR". In José M. Montero (Coord) *Anales de Economía Aplicada*, Delta Publicaciones, Madrid.

JACOBO, A.; JALILE, I. (2012). "Analyzing Contemporary Protectionism: What is Going On With Latin American Countries?", paper presented in the *Asociación Argentina de Economía Política* annual meeting, Trelew, Argentina.

JØRGENSEN, J.; SCHRÖDER, P. (2006). "Tariffs and Firm-Level Heterogeneous Fixed Export Costs," *Contributions to Economic Analysis & Policy*, 5(1), 1-15.

KEE, H.; NEAGU, C.; NICITA, A. (2010). "Is Protectionism on the Rise? Assessing National Trade Policies During the Crisis of 2008". *World Bank Working Paper*, no. 5274.

KEE, H.; A. NICITA; M. OLARREAGA (2008). "Import Demand Elasticities and Trade Distortions", *Review of Economics and Statistics*, 90 (4), 666-682.

KNETTER, M.; PRUSA, T. (2003). "Macroeconomic Factors and Antidumping Filings: Evidence from Four Countries". *Journal of International Economics*, 61 (1), 1-17.

MOORE, M. (2011). "Argentina: There and Back Again", Institute for International Economic *Working Paper* 06.

OLARREAGA, M.; VAILLANT, M. (2011). "Micro and Macro Determinants of Trade Temporary Barriers: The Brazilian Case Over the Last Two Decades". Departamento de Economía, Universidad de la República, *Documento* no. 07/11, accessed May 12, 2012. <http://www.fcs.edu.uy/archivos/0711.pdf>.

PRUSA, T.; SKEATH, S. (2002). "The Economic and Strategic motives for Antidumping Filings". *Weltwirtschaftliches Archives*, 138 (3), 389-413.

ROBERTSON, R. (2011). "Mexico: A Liberalization Leader". In *The Great Recession and Import Protection: The Role of Temporary Trade Barriers*, edited by Chad Bown, 351-383. London, CEPR and The World Bank.

SABRY, F. (2000). "An Analysis of the Decision to File, the Dumping Estimates, and the Outcome of Antidumping Petition". *International Trade Journal* 14 (2), 109-145.

EFICIÊNCIA PORTUÁRIA NO BRASIL: OBSTRUÇÃO OU APOIO AO DESENVOLVIMENTO?

ANA ELISA PÉRICO

Universidade Estadual Paulista (UNESP)/ Faculdade de Ciências e Letras de
Araraquara/Departamento de Economia/
Rodovia Araraquara-Jaú, s/n, Araraquara, São Paulo, Brasil, CEP 14800-901

email: ana.perico@unesp.br

Resumo

O objetivo deste trabalho é analisar a eficiência dos maiores portos brasileiros, de 2010 a 2017. Para atingir esse objetivo, foi aplicada a Análise Envoltória de Dados (abordagem com *bootstrap*) aos dados dos 24 maiores portos brasileiros. Foram utilizadas variáveis operacionais (de infraestrutura e capacidade) e variáveis vinculadas aos tempos de atrasos das atividades portuárias, além informações que caracterizem o porto de forma qualitativa (tipo de carga e estrutura de propriedade). Nossos resultados destacam que o desempenho médio dos portos (público e privado) foi distante do ideal no período. Importante destacar que o elevado tempo de espera para atracar, de parte considerável dos portos, contribuiu muito para os reduzidos indicadores de eficiência obtidos. Este problema pode estar relacionado à baixa capacidade do porto, ineficiências de gestão e obstáculos logísticos. Embora o desempenho médio dos dois grupos de portos tenha sido relativamente semelhante, a trajetória de eficiência dos portos privados é quase sempre ascendente, já que há maior autonomia dos gestores no que diz respeito ao direcionamento do investimento e operação dos portos. O desempenho dos portos públicos é menos variável no período investigado e está relacionado à baixa capacidade do setor público em direcionar recursos para os portos.

Palavras-chave: Portos Brasileiros, análise envoltória de dados, bootstrapping, infraestrutura, logística.

Área temática 10: Economia azul

Abstract

The purpose of this paper is to analyze the efficiency of the largest Brazilian ports, from 2010 to 2017. To achieve this objective, a bootstrapping approach in Data Envelopment Analysis was applied to the data from the 24 largest Brazilian ports. Operational variables (infrastructure and capacity) and variables related to the delays of port activities were used, in addition to information that qualitatively characterizes the port (type of cargo and ownership structure). Our findings highlight that the average performance of ports (public and private) was far from ideal in the period. The variable “waiting time to dock” contributed

to the low efficiency indicators. It can represent problems related to management, logistics and port infrastructure. Although the average performance of the two groups has been relatively similar, the performance of the private ports is almost always increasing, since managers have autonomy regarding the investment and operation of the ports. The performance of the public ports did not change significantly through the years and this is related to the low capacity of the public sector to manage resources to the ports.

Key Words: Brazilian ports, data envelopment analysis, bootstrapping, infrastructure, logistics.

Thematic área 10: Economy blue

1. INTRODUÇÃO

A Análise Envoltória de Dados (DEA) vem sendo utilizada com certa frequência para analisar a eficiência portuária em muitos lugares do mundo. Os resultados encontrados divergem em função da amostra investigada e, principalmente, das variáveis (*input* e *output*) utilizadas. A técnica é robusta e apresenta resultados consistentes e passíveis de serem utilizados no aprimoramento de sistemas portuários mundo afora.

Questões vinculadas à tipologia de carga movimentada pelo porto (contêineres, granel líquido, granel sólido etc.) e à estrutura de propriedade (Terminal de Uso Privado, Porto Público, ou algum tipo de arranjo intermediário) frequentemente são abordadas nas pesquisas realizadas, e ressaltam a importância de tais características para a eficiência dos portos.

Além disso, variáveis tipicamente vinculadas à infraestrutura e capacidade portuária estão na lista da maioria dos trabalhos realizados, justificando, também, a importância desses fatores para o bom desempenho de um porto.

Grande parte das pesquisas realizadas nos últimos anos está relacionada aos portos de países desenvolvidos (Austrália, Japão, Espanha, Portugal etc). Wu e Goh (2010) chamaram a atenção para a escassez de pesquisas em países emergentes: “...*few international studies have been conducted on the port industry in emerging markets either for the lack of data or interest*” (p. 1031), indicando, então, um importante nicho de pesquisa a ser preenchido.

A partir dessas considerações, o objetivo deste trabalho é calcular e analisar a eficiência dos maiores portos brasileiros. Para alcançar esse objetivo, será aplicada a Análise Envoltória de Dados para os dados dos 24 maiores portos brasileiros, no período de 2010 a 2017. Serão utilizadas variáveis operacionais (de infraestrutura e capacidade) e variáveis vinculadas aos tempos de atraso das atividades portuárias, além informações que caracterizem o porto de forma qualitativa (tipo de carga e estrutura de propriedade).

2. EFICIÊNCIA PORTUÁRIA

A partir de uma busca na base de dados Scopus, pelas palavras-chave *port efficiency* e *DEA*, para o período de 2000 à 2015, foram encontrados 33 artigos. Após um filtro preliminar, decorrente do nível de importância dos mesmos (mensurado pela quantidade de citações), 19 importantes contribuições foram selecionadas para leitura e composição do referencial teórico deste trabalho.

Todos os trabalhos tinham como objetivo a mensuração da eficiência de um conjunto de portos. Alguns elementos os distinguiam: a amostra investigada, o método aplicado (quase sempre variações e tipologias da DEA) e as variáveis utilizadas.

As variáveis utilizadas nas pesquisas são alinhadas aos objetivos propostos, aos dados disponíveis e, normalmente, conduzem os resultados encontrados. Nesse sentido, a partir da literatura consultada, é possível encontrar pesquisas que utilizam variáveis financeiras, ambientais e operacionais.

Da amostra de 19 pesquisas consultadas, apenas quatro utilizaram variáveis financeiras e ambientais, resultado da dificuldade na obtenção desses dados.

Restaram, então, 15 pesquisas que utilizaram, principalmente, variáveis operacionais, fazendo referência aos dados relacionados à movimentação de carga (de diversas naturezas) e dados de infraestrutura portuária.

É possível, sistematizar essas pesquisas a partir dos resultados obtidos. Por exemplo, os trabalhos de Valentine e Gray (2001), Barros (2003), Barros e Athanassiou (2004), Tongzon e Heng (2005) e Cullinane e Wang (2005), embora tenham sido desenvolvidos com variáveis nem sempre comuns, concluíram que a estrutura de propriedade do porto (porto privado, porto público, porto misto) é relevante para os níveis de eficiência observados.

Os trabalhos de Yuen, Chang e Cheung (2013) e Figueiredo de Oliveira e Cariou (2015) ressaltaram a questão da importância da concorrência entre portos para os patamares de eficiência alcançados. Ambos os trabalhos destacam um papel ambíguo da concorrência sobre a eficiência portuária. Para Figueiredo e Cariou (2015), que analisaram a eficiência de 200 portos de contêineres de diversos países entre 2007 e 2010, o efeito da concorrência não é significativo quando é medida em escala local (a menos de 300 km) ou a um nível global (mais de 800 km). Para Yuen *et al.* (2013), considerando a amostra investigada, a competição está negativamente correlacionada com o crescimento da eficiência.

Alguns trabalhos, mesmo sem convergência de resultados, merecem destaque pela singularidade na escolha da amostra. Figueiredo de Oliveira e Cariou (2011) optaram por uma amostra composta por 122 portos, de 17 países, que operam exclusivamente com granéis sólidos. Os resultados foram agregados por país e demonstram que a eficiência pode ser alcançada por meio de um número limitado de grandes portos, ou pela combinação de portos menores com características complementares.

A pesquisa de Wu e Goh (2010) teve na sua amostra sete portos de países desenvolvidos (G7) e 15 portos de países em fase de desenvolvimento, com dados de 2005. Os resultados obtidos indicaram que nenhum dos portos dos mercados avançados representava modelo de referência. Os portos de Xangai (China), Chittagong (Bangladesh) e Santos (Brasil) tiveram os níveis de eficiência maiores do que os observados nos portos dos países do grupo G7.

O trabalho de Choi (2011), que analisou a eficiência de portos chineses, coreanos e um porto de Taiwan (dados de 2005 à 2007), concluiu que a eficiência desses portos está mais atrelada às questões de governança, do que de infraestrutura portuária, considerando o elevado nível de investimento em infraestrutura já realizado nos portos. O autor aponta que, considerando as rápidas mudanças na rede logística da região, é mais importante, agora, aos gestores portuários terem estratégias de desenvolvimento sustentável que se adaptem às mudanças tecnológicas.

Barros (2003) aplicou a técnica DEA em 10 portos portugueses, entre 1990 e 2000. O autor evidenciou que os terminais de contêineres tendiam a ser mais eficientes do que os terminais multicargas, sugerindo a presença de deseconomias de escopo. O autor ainda observou que altos níveis de eficiência estavam correlacionados com o espaço de mercado de cada porto.

O trabalho de González e Trujillo (2008) teve como amostra os 10 maiores portos de contêineres da Espanha entre 1990 e 2002, numa época de reformas portuárias. A pesquisa revelou que a reestruturação e as reformas substanciais

introduzidas não só alteraram as condições para o desenvolvimento de atividades portuárias sujeitas à regulação, mas também levaram a melhorias significativas em termos tecnológicos. A eficiência técnica, no entanto, não melhorou de um modo semelhante. No entanto, havia expectativas de uma melhora na eficiência dos portos, ao longo do tempo, como resultado das reformas.

As demais pesquisas (Tongzon, 2001; Itoh, 2002; Hung, Lu & Wang, 2010; Bichou, 2013; e Wanke, 2013) investigaram as questões da infraestrutura portuária (como *input*) e seu impacto na movimentação de carga e contêineres (*output*), em portos de diferentes países do mundo.

Tongzon (2001) calculou a eficiência de 4 portos australianos e 12 de outros países para o ano de 1996. O autor utilizou um modelo que se aproxima de uma função de produção do tipo Cobb-Douglas (capital, trabalho e recursos naturais como *inputs*). Nesse sentido, simbolizando a variável capital, o autor utilizou fatores operacionais (número de berços, guindastes e rebocadores); para a variável trabalho, o número de empregados da atividade portuária foi utilizado; e a área do terminal portuário, foi a medida do *input* recursos naturais. Para além dessas, o autor incorporou o tempo de espera para atracar e o registro de entrada de navios como *inputs* também. Tongzon (2001) utilizou esses recursos para a obtenção dos seguintes produtos: total de contêineres movimentado (TEUs) e movimentação de navios por hora.

Itoh (2002) também fundamentou sua pesquisa a partir de variáveis operacionais para analisar a eficiência de 8 portos japoneses entre 1990 e 1999. Os *inputs* utilizados foram: área do terminal de contêineres, número de berços, número de guindastes e funcionários. O *output* utilizado foi a Carga Movimentada (TEUs). Seus resultados indicaram que os dois portos mais eficientes foram os de Tóquio e Nagoya.

Hung *et al.* (2010) analisaram a eficiência de 31 portos de contêineres da Ásia. Os autores trabalharam uma abordagem *bootstrap* para avaliar o desempenho dos portos. As variáveis utilizadas foram operacionais: (i) *inputs*: área do terminal, extensão do cais, número de berços e número de guindastes de contêineres; (ii) *output*: carga movimentada (TEUs). Os resultados dos autores apontam que os portos da Ásia Oriental são mais eficientes, em média, do que os outros. Os autores indicam, ainda, que esses portos são mais competitivos e destacam que os portos chineses têm investido na expansão da operação portuária.

Bichou (2013) se utilizou de variáveis estruturais e operacionais para avaliar a eficiência de 60 terminais de contêineres espalhados pelo mundo. As variáveis de *inputs* utilizadas foram: área e calado do terminal, extensão total do cais, quantidade de portões de entrada e saída, quantidade de caminhões e veículos utilizados nas operações, índice de uso de guindaste (TEU/guindaste) e índice de empilhamento (TEU/1000 m²). A variável de *output*, como na maior parte das pesquisas, foi a Carga Movimentada (em TEUs).

E, por fim, o trabalho de Wanke (2013) analisou a eficiência de 27 portos brasileiros. O autor utilizou variáveis operacionais e estruturais. Seus *inputs* foram: número de berços, área de armazenagem e área de pátio. Os *outputs* foram: a movimentação de carga (em TEUs) e rendimento dos graneis sólidos. Os resultados indicam que os portos são mais eficientes no que diz respeito à estrutura física do que no embarque de cargas. O autor destaca que o gargalo

brasileiro pode não estar na capacidade dos portos em si, mas na capacidade de recebimento de cargas para expedição.

3. MÉTODO DE PESQUISA

Esta seção tem como objetivo apresentar a delimitação temporal e espacial da pesquisa, propor e validar um modelo teórico de eficiência portuária e definir o modelo de retorno de escala.

A amostra desta pesquisa contemplou os 24 maiores portos instalados no Brasil (em volume movimentado), respeitando o *ranking* classificatório divulgado pelo Ministério da Indústria, Comércio Exterior e Serviços (MDIC) e disponibilizado pelo Sistema de Análise das Informações de Comércio Exterior via Web (Alice Web). O Quadro 1 apresenta a lista de portos investigados.

Quadro 1. Portos investigados

Belém (Pará)	Natal (Rio Grande do Norte)	Salvador (Bahia)
Chibatão (Amazona)	Paranaguá (Paraná)	Santarém (Pará)
Fortaleza (Ceará)	Pecém (Ceará)	Santos (São Paulo)
Imbituba (Santa Catarina)	Porto Velho (Rondônia)	São Francisco do Sul (Santa Catarina)
Itaguaí (Rio de Janeiro)	Portonave (Santa Catarina)	Suape (Pernambuco)
Itajaí (Santa Catarina)	Recife (Pernambuco)	Super Terminais (Amazona)
Itapoá (Santa Catarina)	Rio de Janeiro (Rio de Janeiro)	Vila do Conde (Pará)
Itaqui (Maranhão)	Rio Grande (Rio Grande do Sul)	Vitória (Espírito Santo)

O período de análise considerou os anos de 2010 a 2017, por se constituir o período mais recente, com dados padronizados e integralmente disponibilizados.

A partir da literatura consultada sobre eficiência portuária e disponibilidade de dados, foram pré-selecionadas variáveis de *inputs* e *output* para avaliar o desempenho dos portos, e que vão compor a proposta de modelo de avaliação inicial dessa pesquisa.

3.1 MODELO DE EFICIÊNCIA, ORIENTAÇÃO E RETORNO DE ESCALA

Como as unidades analisadas foram portos, uma medida considerada adequada para avaliar o desempenho dos mesmos foi a Carga Total Transportada, portanto, para a Análise Envolvória de Dados, essa variável foi considerada um *output*.

Considerando os dois fatores anteriormente mencionados (literatura e disponibilidade dos dados), foi possível identificar algumas variáveis operacionais que, em uma avaliação preliminar possuem relação com a medida de desempenho proposta (Carga Total Transportada) e que representam *inputs*: tempo de espera para atracar, número de berços, área de cais e área de armazenagem.

A orientação para o *output* é desejada, considerando que a meta é expandir a carga transportada, mantendo as variáveis estruturantes de *inputs*, visualizando,

ainda, o quanto o tempo de espera para atracar prejudica a eficiência dos portos analisados.

A Análise dos Componentes Principais (PCA-DEA), proposta por Adler e Golany (2001), foi utilizada como método de validação das variáveis. A PCA-DEA busca reduzir a extensão de um conjunto de dados a partir da combinação dos dados originais. Tal técnica é considerada robusta pela comunidade acadêmica, uma vez que preserva parte das variáveis originais (Adler; Yazhemsky, 2010).

Da comparação entre diversos métodos de seleção de variáveis, elaborada por Nararaja e Johnson (2011), foi possível concluir o PCA-DEA tem tempo de execução mais curto e é mais robusta quando se tratam de amostras pequenas e médias (menores que 300), corroborando os achados de Adler e Yazhemsky (2010).

Nesse sentido, a partir do *software SPSS*, a PCA-DEA foi realizada, considerando a proposta inicial de variáveis. A análise foi composta por um painel de dados com 24 portos, observados em 8 anos (t=8), correspondendo a 192 observações.

Como última especificação técnica do modelo, recorreu-se ao teste de Kolmogorov-Smirnov (K-S) para a definição do retorno de escala a ser empregado (constante ou variável), tendo em consideração os dados disponibilizados.

3.2. ANÁLISE ENVOLTÓRIA DE DADOS (DEA) E CORREÇÃO DO VIÉS

A DEA foi realizada a partir do *software Frontier Analyst Professional*, tendo em considerações as especificações técnicas definidas na subseção anterior. O teste K-S apontou o modelo de retornos variáveis (VRS) como o mais adequado, tendo em consideração os dados utilizados. A Equação 1 apresenta o referido modelo com orientação para o *output* (Banker, Charnes & Cooper, 1984).

$$\text{Maximizar } \sum_{i=1}^n v_i x_{ki} + v_k$$

(Equação 1)

Sujeito a:

$$\sum_{r=1}^m u_r y_{rk} = 1$$

$$\sum_{r=1}^m u_r y_{jr} - \sum_{i=1}^n v_i x_{jr} - v_k \geq 0$$

$$u_r, v_i \geq 0$$

Considerando:

$y = \text{outputs}; x = \text{inputs} / u, v = \text{pesos} / r = 1, \dots, m.; i = 1, \dots, n; j = 1, \dots, n.$

Considerando que a DEA é uma abordagem determinística, qualquer resultado diferente de totalmente eficiente pode ser interpretado como ineficiência. Entre outros fatores, essa ineficiência pode ser devida a erros nos dados coletados ou

fatores atribuídos ao acaso, comprometendo os indicadores de eficiência (Dong; Featherstone, 2004).

Como forma de sanar esse problema, foi aplicado o algoritmo *bootstrap*, proposto por Simar e Wilson (1998), aos resultados encontrados para estimar, para cada porto analisado, o intervalo de confiança da eficiência, o viés e a eficiência corrigida. A Equação 2 evidencia o processo de geração do intervalo de confiança para o indicador de eficiência.

$$Pr(\hat{\theta} - \delta \leq \theta \leq \hat{\theta} + \delta) = 1 - \alpha \quad (\text{Equação 2})$$

Onde: θ é o “verdadeiro” indicador de eficiência; $\hat{\theta}$ é uma estimativa do indicador de eficiência; δ é a margem de erro; α é o nível de significância estatística.

Com o intervalo de confiança do estimador de eficiência, obtido via o processo de reamostragem, $IC[\theta, (1 - \alpha)\%] = \hat{\theta} \pm \delta$, encontrou-se um índice de eficiência mais robusto à sensibilidade dos dados. Além disso, é possível encontrar o tamanho do viés do estimador de eficiência ($\hat{\theta} - \hat{\theta}_{boot}$).

Os resultados de *bootstrap* foram gerados por uma reamostragem de 2000 pseudo-amostras. O programa utilizado para rodar os dados foi o FEAR – *Frontier Efficiency Analysis with R* (Wilson, 2005).

A próxima seção apresenta os resultados dessa pesquisa, desde a validação do modelo até os indicadores de eficiência dos portos já corrigidos.

4. RESULTADOS E DISCUSSÕES

4.1. VALIDAÇÃO DO MODELO E RETORNOS DE ESCALA

A PCA-DEA foi realizada, considerando a proposta inicial de variáveis. As comunalidades de todas as variáveis assumiram valores bem superiores à 0,5, não permitindo a exclusão de nenhuma variável. A análise dos autovalores também foi realizada, com extração de dois fatores.

Os dois fatores extraídos explicam 89,4% da variância da carga total; 97,1% da variância do tempo de espera para atracar; 91,9% da variância do número de berços; 95,5% da variância da área de cais e quase 60% da variância da área de armazenagem.

Tendo em consideração os resultados apresentados, conclui-se que o modelo inicial é adequado. Com isso, o modelo de eficiência dessa pesquisa possui as seguintes variáveis de *inputs*: tempo de espera para atracar, número de berços, área de cais e área de armazenagem; e *output*: carga total transportada.

Além disso, o teste de escala (K-S) foi realizado a partir dos dados agregados do período (2010-2017) e o valor desta estatística (0,2975) comparado com o valor crítico ($n=192$; $\alpha=5\%$; $d_{crítico} = 0,17$), permitiu aceitar a hipótese de retornos variáveis de escala (VRS) (Equação 1).

4.2. ANÁLISE ENVOLTÓRIA DE DADOS (DEA)

Esta seção apresenta os resultados da aplicação da DEA aos dados dos 24 portos investigados em oito anos. A execução da DEA foi realizada com todos os portos conjuntamente. No entanto, a análise será apresentada contemplando uma categorização dos portos em: portos públicos e portos privados (TUP).

Todos os resultados apresentados foram corrigidos considerando o erro aleatório inerente aos dados. A metodologia empregada para a correção do viés foi a proposta por Simar e Wilson (1998).

A DEA foi realizada com os dados anualizados, resultando em escores de eficiência anuais. Uma observação importante, notada já a partir da obtenção dos resultados, foi a reduzida variação na eficiência dos portos no período investigado, o que torna, na grande maioria dos casos, o indicador médio de eficiência tão importante quanto os anuais. A maior variabilidade é observada entre os TUPs, principalmente.

4.2.1 PORTOS PÚBLICOS E TERMINAIS DE USO PRIVATIVOS (TUPS)

Os portos públicos representam a maioria dos portos investigados na amostra (19 portos). São responsáveis por 93,85% do total de carga movimentada. Seis desses portos são mais vinculados ao transporte de carga de tipo contêiner e 13 são portos que carregam mais graneis. Para a realidade brasileira, o senso comum associa os portos que transportam mais granéis a portos com maior perfil exportador; e os portos que transportam mais contêineres àqueles de maior perfil importador. Tal associação está fortemente relacionada aos principais bens produzidos e comercializados pelo país.

A média, em todo o período, de eficiência no grupo dos portos públicos alcançou 53,67%, sendo a mediana próxima desse valor (52,81%). O porto mais eficiente da amostra, de Vila do Conde (Pará – Norte), além de possuir perfil de carga granel, é um porto público. A Tabela 1 apresenta os resultados.

Tabela 1. Eficiência dos portos públicos: 2010-2017

Portos	2010	2011	2012	2013	2014	2015	2016	2017	Média
Belém	56.96	55.85	55.86	52.02	51.11	46.89	40.13	37.42	49.53
Fortaleza	58.74	46.21	47.66	46.19	49.89	38.27	34.17	36.37	44.69
Imbituba	8.69	9.64	8.95	9.07	11.64	12.02	16.75	16.49	11.66
Itaguaí	52.66	52.90	52.77	61.48	52.73	91.11	92.03	89.60	68.16
Itajaí	46.87	49.94	52.14	52.84	49.68	7.94	4.71	9.07	34.15
Itaqui	83.95	92.09	75.98	97.01	85.90	99.54	99.43	92.16	90.76
Natal	52.66	5.39	6.14	4.39	7.10	5.16	6.50	4.25	11.45
Paranaguá	93.10	52.90	52.77	52.49	52.73	52.42	52.44	82.37	61.40
Porto Velho	58.02	83.07	90.20	86.05	85.98	81.82	74.80	81.48	80.18

Recife	7.42	9.30	8.85	8.27	8.08	6.13	6.39	5.35	7.47
Rio de Janeiro	16.26	12.42	12.39	12.65	11.71	7.63	7.54	7.75	11.04
Rio Grande	88.87	79.41	84.19	81.79	86.44	61.51	73.69	57.62	76.69
Salvador	54.52	81.92	83.87	83.69	72.54	89.50	87.55	93.49	80.89
Santarém	77.85	97.69	98.88	100.00	97.05	98.96	98.43	100.00	96.11
Santos	52.66	52.90	52.77	52.49	52.73	52.42	52.44	52.23	52.58
São Francisco do Sul	25.12	60.51	35.69	58.17	60.74	62.04	53.72	31.96	48.49
Suape	24.63	23.93	26.27	28.75	33.60	30.66	39.51	32.34	29.96
Vila do Conde	100.00	100.00	100.00	99.04	100.00	100.00	100.00	98.74	99.72
Vitórias	58.06	74.37	67.74	45.41	80.87	71.19	61.78	59.65	64.88
Medidas estatísticas									
Máximo	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Mínimo	7.42	5.39	6.14	4.39	7.10	5.16	4.71	4.25	5.57
Média	53.53	54.76	53.32	54.30	55.29	53.43	52.74	52.02	53.67
Mediana	54.52	52.90	52.77	52.49	52.73	52.42	52.44	52.23	52.81
Desvio-Padrão	27.67	30.95	30.87	31.46	30.27	34.63	34.06	34.87	31.85

A análise apresentada se concentrou, principalmente, nos portos com maior representatividade no comércio internacional, de acordo com o relatório da Agência Nacional de Transportes Aquaviário de 2014 (Antaq, 2014). Nesse sentido, dentre os portos públicos, os portos que mais se destacaram foram os de: Santos, Vitória, Paranaguá, Rio Grande, Rio de Janeiro, Itajaí, São Francisco do Sul e de Salvador. Além desses, o porto de Vila do Conde também foi analisado com mais cautela.

Porto de Santos (SP)

O primeiro porto a ser investigado é o de Santos, tendo em conta a sua grande representatividade no transporte de cargas no país, sendo o maior porto e o com maior participação no comércio exterior, 34,8%, segundo o Instituto de Pesquisa Econômica Aplicada (Campos Neto, Pêgo Filho, Romminger & Ferreira, 2009). Trata-se de um porto de maior perfil granel (65% da carga transportada), que apresentou uma trajetória de eficiência razoável no período de 2010 a 2017. É o porto que possui mais berços, maior área de armazenagem, maior área de cais e que apresenta o maior volume de carga transportada. Em todo o período investigado, não otimizou a utilização de seus recursos para gerar um volume maior de carga transportada.

Para entender melhor esse processo, foram relacionadas variáveis de resultado (carga transportada) e de recursos operacionais (berços e área de armazenagem) do porto de Santos e de um porto de perfil semelhante.

A relação entre carga total e berços resulta na quantidade de toneladas transportada por número de berços. Tendo em conta que o porto de Paranaguá (PR) tem perfil semelhante ao porto de Santos (em estrutura de propriedade e tipo de carga transportada), o porto de Santos transportou de carga por berços, apenas, 50,65% do que foi transportado pelo porto de Paranaguá, apresentando grande potencial de melhoria no uso dos berços.

No que diz respeito à relação entre carga total e área de armazenagem, o resultado é uma medida de carga transportada por m² de área de armazéns. O porto de Santos carregou aproximadamente 1.160 toneladas de carga para cada m² de área de armazenagem. Já o porto de Paranaguá carregou 3.463 toneladas por m² de área de armazéns, indicando que o Porto de Santos tinha potencial de melhor utilização da sua área de armazenagem.

Sobre o tempo de espera para atracar por navios, o porto de Santos apresentou, em média, nos cinco anos de análise, 91,6 horas de espera (quase quatro dias). Tais fatores explicam o indicador de eficiência observado no porto de Santos.

Porto de Vitória (ES)

O porto de Vitória é o segundo maior porto em inserção no comércio internacional, com participação de 9,1% (Campos Neto *et al.*, 2009). Trata-se de um porto que movimenta mais granel do que contêiner. Seu indicador médio de eficiência foi de 64,88% no período.

O porto de Vitória foi comparado ao porto de Rio Grande (RS), também de perfil contêiner e com boa participação no comércio exterior. Considerando a relação entre carga total e berços, o porto de Vitória transportou, aproximadamente, 25% do que foi carregado, por berço, pelo porto de Rio Grande, indicando grande potencial de melhoria no que diz respeito ao transporte de carga por número de berços.

Em relação às toneladas transportadas por m² de área de armazéns, o indicador do porto de Vitória apontou 1.356 toneladas por m² da área de armazenagem. O porto de Rio Grande apresentou indicador de 773. O porto de Vitória melhor utilizou sua área de armazenagem.

O porto de Vitória tem estrutura física maior do que a observada no porto de Rio Grande, exceto em área de armazenagem. Essa informação justifica o maior índice de carga transportada/área de armazenagem no porto de Vitória. No entanto, mesmo com estrutura maior, esse porto carrega cerca de 32% da carga movimentada pelo porto de Rio Grande.

Além disso, o porto de Vitória contou com um tempo médio de espera para atracar de quase 26 horas no período investigado, sendo um dos fatores que impediram que este porto conseguisse um melhor indicador de eficiência.

Porto de Paranaguá (PR)

O porto de Paranaguá possui 8,8% de participação no comércio exterior (Campos Neto *et al.*, 2009) e com predomínio de carga granel (82%). Com indicador de eficiência médio de 61,40%, este porto tem potencial de melhorias, na comparação com seus pares de referência.

O porto de Paranaguá pode ser comparado, por similaridade de estrutura e perfil, ao porto de Itaqui (MA). Tendo em conta a relação entre carga total e número de berços, o porto de Paranaguá transportou 102% do que foi realizado pelo porto de Itaqui, indicando melhor desempenho neste aspecto.

Em relação às toneladas transportadas por m² de área de armazéns, nenhum porto é tão eficiente como o de Paranaguá. O indicador do porto de Itaqui transportou 3.463 toneladas por m² da área de armazenagem. O porto de Paranaguá apresenta indicador de 2.673.

No entanto, mesmo com indicadores que refletem o bom uso de alguns de seus recursos, o grande problema do porto de Paranaguá é o tempo de espera para atracar. O tempo médio de espera alcançou 343 horas, ou seja, quase 15 dias de espera para que os navios atracassem. O bom uso da estrutura física do porto não foi suficiente para elevar seu indicador de eficiência.

Porto do Rio Grande (RS)

O porto do Rio Grande alcançou um indicador médio de eficiência de 76,69%, com razoáveis variações no período de análise. É um porto que transporta mais carga granel (65%). Possui 7,1% de participação no comércio exterior (Campos Neto *et al.*, 2009).

A referência do porto do Rio Grande foi o porto de Vila do Conde (PA), público, de perfil granel e classificado como o único porto eficiente da amostra.

A partir da relação entre carga total e berços, o porto do Rio Grande transportou 47% de carga a mais, por berço, do que o valor observado pelo porto de Vila do Conde. Assim, no que diz respeito à utilização dos berços, o porto de Rio Grande teve melhor desempenho médio.

Para a relação toneladas transportadas por m² de área de armazéns, o indicador do porto de Rio Grande resultou, em média, em 773,42 toneladas carregadas por m² da área de armazenagem. O porto de Vila do Conde apresentou indicador de 1.528,45, demonstrando que o porto de Rio Grande tem potencial para transportar mais toneladas de carga por área de armazenagem. Por fim, destaca-se que o porto do Rio Grande teve um tempo médio de espera para atracar de 77,71 horas, um pouco mais de três na fila para que um navio atracasse no cais.

Porto do Rio de Janeiro (RJ)

O porto do Rio de Janeiro é o quinto maior porto em inserção no comércio exterior, com 6,5% de participação (Campos Neto *et al.*, 2009). É um porto que transporta mais carga do tipo contêiner (65%). O indicador médio de eficiência do porto do Rio de Janeiro, entre 2010-2017, foi bastante reduzido, 11,04%, com amplitude de 8,72% entre seu menor e maior indicadores.

O porto do Rio foi comparado ao porto de Salvador (BA), também de perfil contêiner e com boa participação no comércio exterior. Na análise comparativa, o porto do Rio de Janeiro transportou, em média, 22,6% do que foi observado no porto de Salvador, no que diz respeito à relação entre carga transportada e número de berços.

Em números absolutos, o porto do Rio transportou uma média de 812 mil toneladas por berço, no período de 2010-2017, enquanto o porto de Salvador movimentou quase 3,6 milhões de toneladas/berço. Tais valores apontam uma

subutilização dos berços do porto do RJ, que suportariam um aumento da carga total transportada.

No que diz respeito à relação entre carga total e área de armazenagem, os valores são os seguintes: o porto do Rio transportou 242 toneladas por m² da área de armazéns e o porto de Salvador transportou 1.683 toneladas por m² da área de armazenagem. Tais valores corroboram a conclusão anterior: o porto do Rio de Janeiro possui estrutura para transportar muito mais carga do que movimentou entre 2010-2017.

Por fim, em relação ao tempo médio de espera para que os navios atraquem, no porto do Rio o tempo médio foi de 37 horas, cerca de um dia e meio em fila. Destaca-se que se trata de um valor alto, se comparado a portos de outros países. Mas, para o contexto brasileiro, está abaixo da média dos portos investigados.

Porto de Itajaí (SC)

O porto de Itajaí possui 4,2% de participação no comércio exterior (Campos Neto *et al.*, 2009). É porto de perfil contêiner (99%). Este porto teve indicador médio de eficiência de 34,15% no período investigado, com forte retração nos três últimos anos de análise.

O porto de Salvador foi par de referência para o porto de Itajaí. Em relação às toneladas transportadas por berço, o porto de Itajaí tem desempenho muito melhor que o porto de Salvador, transporta cerca de 85% a mais de toneladas de carga por berço. Já em relação à carga transportada por m² da área de armazéns, o porto de Itajaí transportou 143,5 toneladas por m² da área de armazéns, enquanto o porto de Salvador transportou 1.683.

Vale destacar que a área de armazenagem do porto de Itajaí equivale a nove vezes a área do porto de Salvador, o que ajuda a explicar a reduzida produtividade por m² do porto de Itajaí. No entanto, o porto de Salvador tem duas vezes a quantidade de berços do porto de Itajaí, o que, também, explica a superioridade, neste indicador, deste porto.

Nota-se que o nível de utilização dos berços do porto de Itajaí é bom, se comparado ao porto de Salvador, mas pode ser melhorado, se comparado a outros portos. Além disso, constata-se um baixo aproveitamento da área de armazenagem deste porto, em relação ao porto de Salvador, assim como dos demais. A conclusão aponta para uma maior capacidade de movimentação de carga. Destaca-se, ainda, que o porto de Itajaí, no período, teve um tempo médio de esperar para atracar de 35 horas.

Vale destacar, ainda, que nos três últimos anos da análise, foi possível observar uma grande retração nos indicadores de eficiência deste porto. Isso é resultado da grande redução da carga transportada nestes últimos anos, saindo de 3,8 milhões de toneladas em 2014 e chegando em 1,8 milhão em 2017.

Porto São Francisco do Sul (SC)

O porto de São Francisco do Sul obteve indicador de eficiência de 48,49% no período investigado. Trata-se de um porto de perfil granel. Tem participação de 2,9% no comércio internacional (Campos Neto *et al.*, 2009), embora seja um porto com um grande tempo de espera para que os navios atraquem. Entre o período de 2010 à 2017, o tempo médio de espera foi de 148 horas, que equivale a 6,2 dias.

O porto de São Francisco do Sul foi comparado ao porto de Itaqui (MA), também de perfil de carga granel. Tendo em conta a relação entre carga total e berços, o porto de São Francisco do Sul transportou aproximadamente 59% do que foi carregado, por berço, pelo porto de Itaqui, indicando potencial de melhoria em relação ao transporte de carga por número de berços.

Em relação às toneladas transportadas por m² de área de armazéns, o indicador do porto de São Francisco do Sul apontou, em média, 931 toneladas por m² da área de armazenagem. O porto de Itaqui, seu par de referência, apresenta indicador de 2.674, apresentando imensa superioridade na utilização de sua área de armazenagem.

Vale destacar que esse último indicador destoou bastante do observado em Itaqui, devido ao fato de a área de armazenagem do porto de São Francisco Sul ser o dobro da armazenagem do porto de Itaqui.

Ainda assim, com um reduzido aproveitamento dos berços, mensurado pelas toneladas de carga transportadas por berço, e grande tempo de espera para atracar, o porto de São Francisco do Sul teve baixo nível de eficiência. Ressalta-se que com sua estrutura própria estabelecida tem grande potencia de melhoria.

Porto de Salvador (BA)

O porto de Salvador possui perfil de carga do tipo contêiner. Teve um bom indicador de eficiência (80,89%) e participação de 2,3% no comércio exterior (Campos Neto *et al.*, 2009). O TUP Portonave (SC) foi seu par de referência, um grande transportador de contêiner.

Em relação às toneladas transportadas por berço, o porto de Salvador transportou, aproximadamente, 20%, do que foi carregado no Portonave. Enquanto o primeiro porto transportou quase 3,6 milhões de toneladas por berço, o segundo porto foi responsável por 18,7 milhões de toneladas por berço. Destaca-se que o porto de Salvador tem nove berços e o Portonave, apenas, três. Mas, ainda assim, analisando os dados de forma relativa, o porto de Salvador não mostrou bom desempenho em relação ao transporte de cargas por berços.

No que diz respeito à relação carga transportada por m² da área de armazéns, o porto de Salvador transportou 1.683 toneladas por m² da área de armazéns, enquanto o Portonave transportou 209. Neste indicador, o porto de Salvador mostrou melhor desempenho. Além disso, fica muito evidenciada a baixa utilidade da grande área de armazenagem do TUP Portonave, o que prejudica em muito seu indicador de eficiência.

Por fim, o porto de Salvador apresentou um tempo médio de espera para atracar relativamente baixo, de 18,6 horas.

Os portos de Salvador e Portonave tiveram indicadores de eficiência próximos, 80,89% e 79,65%, respectivamente. No que diz respeito ao tempo de espera para atracar e na carga transportada por berço, o Portonave apresentou melhores resultados. No nível de aproveitamento da área de armazéns, relacionada à carga transportada, o porto de Salvador se mostrou melhor. No entanto, mesmo com bons indicadores, ambos os portos tem potencial de transportar mais carga, tendo em consideração a estrutura portuária que possuem.

Porto de Vila do Conde (PA)

O porto de Vila do Conde foi o que teve melhor desempenho na análise aqui realizada. Em quase todos os anos foi o porto que melhor utilizou seus recursos (estrutura portuária), tendo em vista nível de carga transportada. É, também, um porto público e de perfil de carga transportada granel (97%). Não se trata de um porto com grande inserção internacional.

Não há par de referência para analisar este porto, tendo em consideração que ele foi o mais eficiente em quase todos os anos. No entanto, é possível analisar seus dados de aproveitamento de recursos, assim como de tempo médio de espera para atracar.

Da relação carga total/berços, o porto de Vila do Conde transportou, em média, 10,1 milhões de tonelada de carga por berço, no período de 2010 à 2017. Da relação carga total/ m² da área de armazéns, este porto carregou 1.529 toneladas por m² da área de armazenagem. São bons indicadores e que refletem na pontuação de eficiência do porto de Vila do Conde. Outro fator que se destaca é o reduzido tempo médio de espera para atracar neste porto, cerca de 20 minutos. Entre os portos públicos, com exceção do porto de Belém, também no Pará, nenhum porto brasileiro, da amostra investigada, apresentou tempo de espera para atracar tão baixo neste período.

A Tabela 2 apresenta a relação entre as variáveis de *input* (berço e área de armazenagem) e a variável de *output* (carga total transportada), de cada um dos portos investigados, para o período agregado de 2010-2017.

Tabela 2. Relações *Output/Input*: 2010-2017

Portos	Carga Total/Berços	Carga Total/Armazenagem
Belém	3.917.502,33	202,62
Fortaleza	7.459.153,40	227,41
Imbituba	8.166.200,33	76,80
Itaguaí	56.808.449,50	1.205,48
Itajaí	6.666.829,75	143,53
Itaqui	22.057.280,67	2.673,61
Natal	1.273.542,33	92,28
Paranaguá	22.572.103,86	3.463,12
Porto Velho	4.427.855,20	716,48
Recife	1.792.407,57	266,20
Rio de Janeiro	811.955,19	241,47
Rio Grande	15.024.073,82	773,42
Salvador	3.592.780,11	1.682,89
Santarém	10.378.679,00	1.256,70

Santos	11.434.250,74	1.159,82
São Francisco do Sul	13.003.462,43	930,72
Suape	11.169.825,91	279,25
Vila do Conde	10.169.021,75	1.528,45
Vitória	3.767.952,21	1.356,08

Em relação aos Terminais de Uso Privativo (TUPs), a Tabela 3 apresenta os indicadores de eficiência do grupo formado por esses portos, comumente chamados de portos privados, no período de 2010 à 2017.

Dos 5 terminais de uso privativos investigados, três são de perfil contêiner e dois são de perfil granel.

Tabela 3. Eficiência dos TUPs: 2010-2017

Portos	2010	2011	2012	2013	2014	2015	2016	2017	Média
Chibatão	89,30	40,56	88,50	81,46	89,64	93,61	95,90	57,65	79,58
Itapoá	nd	52,90	86,96	93,12	70,71	93,69	94,05	90,81	83,18
Pecém	11,97	11,42	34,33	30,82	65,30	21,13	33,10	51,97	32,50
Portonave	98,37	83,78	89,50	75,93	64,33	68,56	84,67	72,05	79,65
SuperTerminais	93,64	93,33	83,36	82,82	21,66	52,42	52,44	72,48	69,02
Medidas estatísticas									
Máximo	98,37	93,33	89,50	93,12	89,64	93,69	95,90	90,81	93,04
Mínimo	11,97	11,42	34,33	30,82	21,66	21,13	33,10	51,97	27,05
Média	73,32	56,40	76,53	72,83	62,33	65,88	72,03	68,99	68,54
Mediana	91,47	52,90	86,96	81,46	65,30	68,56	84,67	72,05	75,42
Desvio-Padrão	41,07	33,17	23,71	24,29	24,91	30,55	27,90	15,13	27,59

A análise apresentada se concentrou nos portos com maior e menor desempenho na análise envoltória de dados. Destaca-se que os TUPs selecionados correspondem àqueles com maior movimentação de carga (em moeda) no período investigado.

TUP de Pecém (CE)

O terminal de Pecém teve o menor desempenho médio (51,97%) dentre os TUPs no período. A maior parte da carga transportada por este porto é granel (60%). O porto de Rio Grande (RS) foi seu par de referência.

Em relação às toneladas transportadas por berço, o porto de Pecém transportou 66% do que foi carregado, por berço, no porto do Rio Grande. Destaca-se que o porto de Pecém tem boa estrutura portuária, com quantidade de berços semelhante à maior parte dos portos, indicando que o nível de aproveitamento dos berços pode ser melhorado.

No que diz respeito à relação carga transportada por m² da área de armazéns, o porto de Pecém transportou 161 toneladas por m² da área de armazéns, enquanto o porto de Rio Grande transportou 773. Neste quesito, o porto de Pecém, também, apresentou baixo desempenho.

Por fim, o porto de Pecém apresentou um tempo médio de espera para atracar considerado alto, de 146,5 horas. Portanto, mesmo localizado em região estratégica e contando com boa estrutura portuária, o porto de Pecém perdeu competitividade, tendo em conta o grande tempo de espera para que os navios atracassem neste porto.

TUP Super Terminais (AM)

O TUP Super Terminais apresentou bom desempenho médio dentre os TUPs analisados, alcançando indicador de 72,48%, possuindo tempo médio de espera para atracar de 50 minutos.

O porto de Salvador (BA) foi o par de referência para o Super Terminais. O Super Terminais transportou 120% a mais de carga total, por berço, do que o porto de Salvador, mostrando que nesse aspecto, o TUP Super Terminais é mais eficiente. No entanto, o Super Terminais não apresentou o mesmo desempenho na relação entre carga total transportada e área de armazenagem. O porto de Salvador transportou 1.683 toneladas por m² da área de armazéns, enquanto o TUP Super Terminais transportou 140,2 toneladas.

O indicador de eficiência contempla todas essas questões. Com isso, mesmo que nessa última relação o TUP Super Terminais tenha menor desempenho que o porto de Salvador, nas demais, ele apresenta superioridade, obtendo melhor resultado de eficiência.

TUP Itapoá (SC)

O terminal de Itapoá foi o TUP com uma boa evolução no período investigado, sendo que em 2011 possuía um indicador de eficiência de 52,90% e, em 2017, alcançou 94,05%.

Este incremento na eficiência é explicado pelo fato de que no final de 2011 inaugurou-se uma via asfaltada com acesso independente ao porto, melhorando muito a logística portuária de acesso ao TUP Itapoá. Apresentando uma boa estrutura de serviços, é possível observar que o problema da ineficiência de Itapoá estava relacionado à infraestrutura de acesso ao porto, já que, depois de melhorado o acesso, o porto apresentou boa eficiência.

O TUP de Itapoá teve como par de referência o TUP Portonave (SC). O TUP de Itapoá transportou, em média, 90% da carga total, por berço, do que o TUP de Portonave transportou, mostrando que nesse aspecto foi menos eficiente. O TUP de Itapoá transportou 215 toneladas por m² da área de armazéns, enquanto o Portonave transportou 209. No segundo aspecto, o TUP de Itapoá apresentou-se mais eficiente do que o TUP Portonave. O TUP de Itapoá apresentou tempo médio de espera para atracar de 6,5 horas; enquanto o Portonave foi de 14 horas.

A Tabela 4 apresenta a relação entre as variáveis de *input* (berço e área de armazenagem) e a variável de *output* (carga total transportada), de cada um dos portos investigados, para o período agregado de 2010-2017.

Tabela 4. Relações *Output/Input*: 2010-2017

Portos	Carga Total/ Berço	Carga Total/ Armazenagem
Chibatão	6.448.984,75	220,48
Itapoá	16.796.953,00	215,35
Pecém	9.882.345,33	160,73
Portonave	18.774.321,67	208,60
Super Terminais	7.922.204,50	140,22

4.2.2. CONSIDERAÇÕES GERAIS

Em linhas gerais, é possível notar certa constância entre os portos mais e menos eficientes no decorrer do período investigado. A Tabela 5 apresenta, de forma sintetizada, os dois portos mais e menos eficientes em cada ano, assim como algumas informações que qualificam a análise individual de cada um.

Na tentativa de melhor visualizar e compilar os resultados, chega-se às seguintes conclusões: os portos de Vila do Conde (PA) e Recife (PE), públicos e de perfil granel, são os mais e menos eficientes da amostra investigada, respectivamente. Com isso, não é possível definir um padrão na análise que permita afirmar, por exemplo, que a estrutura de propriedade (público ou privado) seja fundamental para que um porto tenha bom desempenho no Brasil.

No entanto, pelo perfil de carga transportada, é possível pressupor que a movimentação predominante nesses dois portos seja a de exportação, já que ambos são graneleiros. O que significa que tanto o melhor, como o pior indicadores de eficiência estão relacionados a portos exportadores. Ambos os portos têm acesso a rodovias e mar. O porto de Vila do Conde possui acesso, ainda, a rios; e o porto de Recife tem acesso a ferrovias. Essas informações são relevantes, pois permitem concluir que esses portos têm uma variedade de canais de acesso, facilitando o escoamento de carga.

O Portonave (SC) foi um TUP com bom indicador de eficiência em 2010 (98,37%). O transporte predominante é o de contêineres. Esse é o único porto de perfil contêiner considerado eficiente na amostra. O acesso a esse terminal é garantido por rodovia e mar.

Dois outros portos foram classificados como bastante ineficientes: Imbituba e Itajaí, ambos localizados no estado de Santa Catarina, sul do país. O porto de Imbituba é público e teve o pior indicador de eficiência em um ano do período investigado. O acesso a ele é garantido por mar, estradas e ferrovias. Seu perfil de carga predominante é granel sólido.

O porto de Itajaí também é público, de perfil contêiner e acesso por rodovia e mar. Nos três últimos anos da análise foi possível observar uma grande retração nos

indicadores de eficiência deste porto. Isso é resultado da redução da carga transportada nestes últimos anos.

Tabela 5. Dados dos portos mais e menos eficientes: 2010-2017

Ano		Porto	Propriedade	Carga	Acesso
2010	(+) eficiente	Vila do Conde (PA)	Público	Granel Sólido	- Rodovia - Fluvial - Marítimo
	(+) eficiente	Portonave (SC)	TUP	Contêiner	- Rodovia - Marítimo
2011, 2012, 2013, 2014 e 2017	(+) eficiente	Vila do Conde (PA)	Público	Granel Sólido	- Rodovia - Fluvial - Marítimo
	(+) eficiente	Santarém (PA)	Público	Granel Sólido	- Rodovia - Fluvial
2015 e 2016	(+) eficiente	Vila do Conde (PA)	Público	Granel Sólido	- Rodovia - Fluvial - Marítimo
	(+) eficiente	Itaqui (MA)	Público	Granel Sólido e Líquido	- Rodovia - Ferrovia - Fluvial - Marítimo
2010	(-) eficiente	Imbituba (SC)	Público	Granel Sólido	- Rodovia - Ferrovia - Marítimo
	(-) eficiente	Recife (PE)	Público	Granel Sólido	Rodovia - Ferrovia - Marítimo
2011, 2012, 2013, 2014, 2015 e 2017	(-) eficiente	Natal (RN)	Público	Contêiner	- Rodovia - Marítimo
	(-) eficiente	Recife (PE)	Público	Granel Sólido	- Rodovia - Ferrovia - Marítimo
2016	(-) eficiente	Itajaí (SC)	Público	Contêiner	- Rodovia - Marítimo
	(-) eficiente	Recife (PE)	Público	Granel Sólido	- Rodovia - Ferrovia - Marítimo

Por fim, vale ressaltar uma questão relevante, a subutilização dos recursos por parte da maior parte dos portos indica que os problemas de baixa eficiência das

unidades podem estar relacionados a fatores vinculados à própria estrutura do porto e à má condução de gestão e decisões estratégicas. Wanke (2013) já apontavam que a ineficiência dos portos brasileiros poderia não estar relacionadas à capacidade dos portos.

5. CONSIDERAÇÕES FINAIS

A fim de analisar a eficiência dos vinte e quatro maiores portos instalados no Brasil, no período de 2010 a 2017, o presente estudo aplicou a técnica DEA aos dados portuários disponibilizados periodicamente pela Antaq.

Acredita-se que a divisão dos portos segundo sua estrutura de propriedade e perfil de carga transportada facilitou a compreensão do desempenho de cada um destes. A literatura nacional e internacional, revisada para a elaboração deste trabalho, apresentou fundamental importância na determinação da metodologia e do modelo a serem aplicados e na forma como a análise de cada um dos portos poderia ser elaborada.

Com o método VRS aplicado ao modelo de quatro *inputs* e um *output*, com orientação ao *output*, a DEA apresentou resultados bastante condizentes à realidade portuária e econômica do Brasil entre 2010 e 2017.

Vale destacar que, num primeiro momento, diferentemente do que é comumente utilizado em pesquisas internacionais, nesta pesquisa optou-se pela utilização da variável “carga total” como *output*, e não a variável “TEUs”.

No Brasil há dois tipos de portos: portos com perfil de carga granel e portos com perfil de carga contêiner. Logo, portos de perfil granel não fazem uso de TEUs, ou mesmo contêineres para o transporte da carga. Nesse sentido, mobilizariam recursos (*inputs*) e não teriam registro de TEUs transportados, desvirtuando os indicadores de eficiência. Com isso, optou-se pela variável “carga total”, que remete à quantidade de toneladas de carga carregada.

Somente no primeiro ano da análise um TUP esteve entre as unidades mais eficientes. É de se ressaltar que o grupo dos portos privados é muito menor, em quantidade, do que o agrupamento dos portos públicos.

Em se tratando dos portos públicos, estes apresentaram índices de eficiência bem distribuídos, o que torna esta categoria mais heterogênea. A moderada eficiência em transformar os *inputs* em *output* por parte dos portos públicos pode estar atribuída ao fato de estes dependerem de políticas e investimentos públicos. É possível identificar variações mais contidas na eficiência média desses portos ao longo do período em questão.

No entanto, foram dois portos públicos, ambos do Pará, que apresentaram eficiência máxima durante os oito anos estudados, sendo utilizados como *benchmark* várias vezes por portos públicos e privados; revelando, ainda assim, o mérito de um porto público.

Vale a pena, também, uma reflexão sobre a variável “tempo de espera para atracar”. A primeira coisa a ser considerada é que ela não representa, efetivamente, um insumo produtivo. Trata-se do registro de uma ocorrência negativa observada nos portos brasileiros. Pode representar problema de gestão, logística e, até mesmo, infraestrutura portuária. Portanto, o olhar deve ser cuidadoso. Nas análises realizadas, foi possível observar que valores baixos ou

pequenos para essa variável não eram indicativos da eficiência dos portos. Ou seja, o fato de um porto não ter “tempo de espera para atracar” não era garantia de seu bom desempenho. No entanto, o contrário pode ser verdadeiro. Ter valores significativos para essa variável pode representar a ineficiência de um porto.

Por fim, deve ser considerado, ainda, que questões vinculadas à localização estratégica de um porto são de fundamental relevância para os usuários. Mas, já não são as únicas a serem consideradas na tomada de decisão sobre qual porto utilizar. Tanto para os exportadores, como para os importadores, as filas de espera, seja para os caminhões ingressarem no porto, seja para os navios atracarem, representam obstáculos na utilização de vários portos brasileiros. Por vezes, utilizar um porto mais próximo ou com a localidade estratégica, pensando em exportação, pode ser mais oneroso para o cliente.

Nesse sentido, as filas podem indicar vários problemas no sistema portuários brasileiro: desde um problema de excesso de burocracias para o escoamento da carga, afetando a exportação e importação; um problema de estrutura e infraestrutura portuária, indicando que a capacidade do porto não comporta a movimentação observada, gerando filas (afetando exportação e importação); até um problema de governança e estratégias de gestão, que pode resultar na baixa demanda pelos serviços de determinados portos. Problemas de gestão e governança também foram identificados nos portos da China e Coréia e Taiwan (Choi, 2011).

Nada impede, ainda, que a ineficiência de um porto esteja atrelada a mais de um desses problemas elencados. O resultado desse cenário é a baixa produtividade de grande parte dos portos brasileiros, prejudicando diretamente a balança comercial e a competitividade do país.

REFERÊNCIAS

- ADLER, N.; GOLANY, B. (2001): Evaluation of deregulated airline networks using data envelopment analysis combined with principle component analysis with an application to Western Europe. *European Journal of Operational Research*, 132, 260-273.
- ADLER, N.; YAZHEMSKY, E. (2010): Improving discrimination in data envelopment analysis: PCA-DEA or variable reduction. *European Journal of Operational Research*, 202, 273-284.
- AGÊNCIA NACIONAL DE TRANSPORTES AQUAVIÁRIOS - ANTAQ. (2014): *Anuário Estatístico*. Transporte Navegação Longo Curso. 2014. Available at: <http://web.antaq.gov.br/Anuario2014/>
- BANKER, R. D.; CHARNES, A.; COOPER, W. W. (1984): Some models for estimating technical and scale inefficiencies in data envelopment analysis. *Management Science*, 30, 1078-1092.
- BARROS, C. P. (2003): The measurement of efficiency of Portuguese seaport authorities with DEA. *International Journal of Transport Economics*, 30, 335-354.
- BARROS, C. P.; ATHANASSIOU, M. (2004): Efficiency in European seaports with DEA: Evidence from Greece and Portugal. *Maritime Economics and Logistics*, 6, 122-140.
- BICHOU, K. (2013): An empirical study of the impacts of operating and market conditions on container-port efficiency and benchmarking. *Research in Transport Economics*, 42, 28-37.
- CAMPOS NETO, C. A. S.; PÊGO FILHO, B.; ROMMINGER, A. E.; FERREIRA, I. M. (2009): *Porto Brasileiros 2009: ranking, área de influência, porte a valor agregado médio dos*

- produtos movimentados*, working paper n. 1408, Instituto de Pesquisa Econômica e Aplicada, Rio de Janeiro, Junho.
- CHOI, Y. (2011): The efficiency of major ports under logistics risk in Northeast Asia. *Asia-Pacific Journal of Operational Research*, 28, 111-123.
- CULLINANE, K. P. B.; JI, P.; WANG, T. F. (2005): The relationship between privatization and DEA estimates of efficiency in the container port industry. *Journal of Economics and Business*, 57, 433-462.
- DONG, F.; FEATHERSTONE, A. (2006): Technical and Scale Efficiencies for Chinese Rural Credit Cooperatives: A Bootstrapping Approach in Data Envelopment Analysis. *Journal of Chinese Economic and Business Studies*, 4, 57-75.
- FIGUEIREDO DE OLIVEIRA, G.; CARIOU, P. (2011): A DEA study of the efficiency of 122 iron ore and coal ports and of 15/17 countries in 2005. *Maritime Policy and Management*, 38, 727-743.
- FIGUEIREDO DE OLIVEIRA, G.; CARIOU, P. (2015): The impact of competition on container port (in)efficiency. *Transportation Research Part A: Policy and Practice*, 78, 124-133.
- HUNG, S.; LU, W.; WANG, T. (2010): Benchmarking the operating efficiency of Asia container ports. *European Journal of Operational Research*, 203, 706-713.
- ITOH, H. (2002): Efficiency changes at major container ports in Japan: A window application of data envelopment analysis. *Review of Urban and Regional Development Studies*, 14, 133-152.
- NATARAJA, N. R.; JOHNSON, A. L. (2011): Guideline for using variable selections techniques in data envelopment analysis. *European Journal of Operational Research*, 215, 662-669.
- SIMAR, L.; WILSON, P. W. (1998): Sensitivity analysis of efficiency scores: How to bootstrap in nonparametric frontier models. *Management Science*, 44, 49-61.
- TONGZON, J. (2001): Efficiency measurement of selected Australian and other international ports using data envelopment analysis. *Transportation Research Part A: Policy and Practice*, 35, 13-128.
- TONGZON, J.; HENG, W. (2005): Port privatization, efficiency and competitiveness: Some empirical evidence from container ports (terminals). *Transportation Research Part A: Policy and Practice*, 39, 405-424.
- VALENTINE, V. F.; GRAY, R. (2001): *The measurement of port efficiency using data envelopment analysis*. Proceedings of the 9th World Conference on Transport Research, 22-27 July, Seoul, 2001. Available at: https://www.researchgate.net/publication/277617009_The_measurement_of_port_efficiency_using_data_envelopment_analysis
- WANKE, P.F. (2013): Physical infrastructure and shipment consolidation efficiency drivers in Brazilian ports: A two-stage network-DEA approach. *Transport Policy*, 29, 145-153.
- WILSON, P. W. (2005): *FEAR 1.0: a software package for Frontier Efficiency Analysis with R*. Austin, Texas: Department of Economics, University of Texas at Austin, 14 p. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.528.9314&rep=rep1&type=pdf>
- WU, Y. C. J.; GOH, M. (2010): Container port efficiency in emerging and more advanced markets. *Transportation Research Part E: Logistics Transportation Review*, 46, 1030-1042.
- YUEN, A. C. L.; ZHANG, A.; CHEUNG, W. (2013). Foreign participation and competition: A way to improve the container port efficiency in China? *Transportation Research Part A: Policy and Practice*, 49, 220-231.

EL PRESTIGE: COMPARATIVA DE LOS REGÍMENES INTERNACIONALES DE RESPONSABILIDAD CIVIL

RAQUEL FERNÁNDEZ GONZÁLEZ

Departamento Economía Aplicada. Universidad de Vigo
Estrada San Cosme, 2, 36310 Vigo, Pontevedra/raquelf@uvigo.es

MARCOS ÍÑIGO PÉREZ PÉREZ

Departamento Economía Aplicada. Universidad de Vigo
Estrada San Cosme, 2, 36310 Vigo, Pontevedra/marcos.perez@uvigo.es

MANUEL MARÍA VARELA LAFUENTE

Departamento Economía Aplicada. Universidad de Vigo
Estrada San Cosme, 2, 36310 Vigo, Pontevedra/mmvarela@uvigo.es

e-mail Raquel Fernández: raquelf@uvigo.es

Resumen

El regreso de las instituciones a la agenda principal de investigación ha puesto de relieve la importancia de las mismas en el análisis económico. La Nueva Economía Institucional ha permitido una mejor comprensión de los casos de estudio, incluyendo los concerniente a la gestión de los recursos naturales. En este artículo, el análisis institucional se centra en el ámbito marítimo, donde coexisten dos grandes regímenes de responsabilidad civil por contaminación (OPA 90-OMI), cada uno en un ámbito geográfico diferente (Estados Unidos - Europa). Por ello se realiza un análisis comparativo entre los dos grandes regímenes de asignación de responsabilidad civil existentes aplicándolos a la catástrofe del Prestige. De este modo, la asignación y distribución de responsabilidades acaecidas en la investigación y posterior proceso judicial del Prestige se compara con un escenario alternativo en donde los instrumentos de compensación aplicables se rigen por lo establecido en la Oil Pollution Act de 1990 (OPA 90), para así establecer un análisis riguroso sobre los efectos que las distintas normas pueden tener en un mismo escenario. En la comparativa establecida en el caso del Prestige, donde las responsabilidades se solventaron muy laxamente en un proceso judicial con altos costes de transacción, la aplicación de normas regidas por la OPA 90 no contaría con un grado de imperfección tan alto. Esto es así ya que aplicando la *preponderancia de la evidencia* existente en la OPA 90 no existirían atenuantes por los que librar a los responsables. Por otra parte, los agentes involucrados en el hundimiento no se limitarían solo al propietario si no que operarios o armadores serían responsables también. Además, la cuantía de indemnización aumentaría al contabilizar en el recuento de daños los perjuicios personales, los impuestos sin percibir y el daño ecológico suscitado en un sentido amplio.

Palabras clave: Nueva Economía Institucional, responsabilidad civil, Oil Pollution Act (OPA 90), OMI, Prestige.

Área Temática 10: Economía Azul. Del Mar y Actividades Marítimas

Abstract

The return of institutions to the main research agenda has highlighted the importance of rules in economic analysis. The New Institutional Economics has allowed a better understanding of the case studies that concern different areas of knowledge, also the one concerning the management of natural resources. In this article, the institutional analysis focuses on the maritime domain, where two large civil liability regimes for pollution coexist (OPA 90-IMO), each in a different geographical area (United States - Europe). Therefore, a comparative analysis is made between the two large regimes of civil responsibility assignment applying them to the Prestige catastrophe. In this way, the allocation and distribution of responsibilities in the investigation and subsequent judicial process of the Prestige is compared with an alternative scenario in which the applicable compensation instruments are governed by the provisions of the Oil Pollution Act of 1990 (OPA 90), in order to establish a rigorous analysis on the effects that the different norms can have in the same scenario. In the comparative established in the case of the Prestige, where the responsibilities were solved very slowly in a judicial process with high transaction costs, the application of rules governed by the OPA 90 would not count with such a high degree of imperfection. This is so, since by applying the preponderance of the evidence existing in OPA 90 there would be no mitigation for the presumed culprits. On the other hand, the agents involved in the sinking would not be limited only to the owner, but also that operators or shipowners would be responsible as well. In addition, the amount of compensation would increase when counting in the damage count the personal damages, the taxes without perceiving and the ecological damage caused in a broad sense, damages not computable in the IMO.

Key Words: New Institutional Economics, civil liability, Oil Pollution Act (OPA 90), IMO, Prestige.

Thematic Area 10: Blue Economy

1. INTRODUCCIÓN

En el ámbito marítimo, coexisten dos grandes regímenes de responsabilidad civil por contaminación, cada uno en un ámbito geográfico diferente. En Europa, y por tanto en España, los tratados internacionales diseñados en el seno de la OMI (Organización Marítima Internacional) regulan la responsabilidad por contaminación a través de dos acuerdos: “El Convenio Internacional sobre Responsabilidad Civil por Daños Debidos a la Contaminación por Hidrocarburos, 1992” que legisla la responsabilidad civil del propietario del buque y “El Convenio de Constitución de un Fondo Internacional de Indemnización de Daños causados por la Contaminación por Hidrocarburos, 1992” o también llamado FIDAC, el cual delega la compensación de los daños a través de un fondo. En cuanto a los EE.UU., la legislación aplicable en materia de seguridad y lucha contra la contaminación viene determinada por la Oil Pollution Act (OPA 90), siendo complementada por legislación propia de cada Estado.

El análisis comparativo entre los dos regímenes de responsabilidad civil nos muestra que la doctrina estadounidense se alza como un sistema más riguroso que el europeo, pues implica a más sujetos responsables, abarca más tipos de daños indemnizables e impone mayores indemnizaciones.

Todas estas características establecen que el escenario determinado por la OPA 90 reduce los comportamientos oportunistas de los individuos.

Ante este análisis comparativo, cabe preguntarse qué hubiese sucedido si España contase con un marco institucional de responsabilidad civil como el impuesto por la OPA 90 en la catástrofe ambiental del Prestige. La justicia española, aplicando los convenios de la OMI, desestimó en su mayoría las responsabilidades por los delitos contra el medio ambiente y desobediencia grave. Ello conlleva que solo una mínima parte de la cuantía de los daños causados fue cubierta.

2. LA NUEVA ECONOMÍA INSTITUCIONAL Y EL ANÁLISIS ECONÓMICO DEL DERECHO

2.1. LA NUEVA ECONOMÍA INSTITUCIONAL

A lo largo de las tres últimas décadas las instituciones han regresado al centro de la agenda de investigación principal de las ciencias sociales. Este proceso ha sido protagonizado en la ciencia económica por el programa de la Nueva Economía Institucional (NEI).

El programa de la NEI consiguió integrar el papel de las instituciones en el análisis económico a través de la noción coaseana de costes de transacción (Caballero 2001, 2002; Kingston y Caballero, 2009). Desde este enfoque de análisis positivo, las instituciones entendidas como “las reglas del juego” (reglas formales, normas informales y mecanismos de cumplimiento) determinan la estructura de incentivos en la economía y resultan claves para entender el funcionamiento económico en sociedad.

Por un lado, Coase (1937) generó un enfoque microanalítico de las organizaciones que dio lugar a la economía de los costes de transacción (Williamson, 1985); por otro lado, Coase (1960) generó un enfoque macroanalítico que estudia las

relaciones entre instituciones y funcionamiento económico, así como los procesos de cambio institucional (North, 1981, 1990a). La NEI incorpora ambos enfoques, que están mutuamente inter-relacionados, y estudia las instituciones y cómo las instituciones interactúan con las organizaciones en la economía (Menard y Shirley, 2005). El programa de la NEI, al incorporar el papel de las instituciones, ha construido un marco analítico en el que la historia, la cultura y creencias y la política importan, y lo ha hecho partiendo de los fundamentos económicos neoclásicos. De acuerdo a North (1994), el marco analítico de la NEI es una modificación de la teoría neoclásica que conserva los supuestos básicos de escasez y competencia, así como los instrumentos analíticos de la teoría microeconómica, pero que modifica el supuesto de la racionalidad y añade la dimensión del tiempo.

2.2. LAW AND ECONOMICS, O LA IMPORTANCIA DEL DERECHO EN LA ECONOMÍA

En un mundo con costes de transacción nulos (Coase, 1960), la ley no tiene relevancia sobre el nivel de producción, porque cuando el sistema de precios funciona sin costes, la maximización de la producción es independiente del sistema legal. Pero en el mundo real con costes de transacción positivos los sistemas legales surten efectos sobre el sistema económico: la reacomodación de derechos solo se llevará a cabo cuando permite un aumento de la producción superior a los costes de transacción. De este modo, podemos concluir que la solución eficiente no es independiente de la norma jurídica elegida. En función de cómo sea la delimitación de los derechos de propiedad así será el nivel de eficiencia y producción. Coase (1960) establece el primer vínculo sistemático entre economía y derecho a través del concepto de externalidad económica y de daño jurídico. La importancia de este trabajo es que permite concluir que cuando hay costes de transacción positivos la solución eficiente dependerá de la norma jurídica elegida: la ley tiene importancia económica y el conjunto legal determinará el grado de eficiencia de una sociedad.

En este sentido, Coase (1960) encuentra dos campos de actuación posibles para el Estado y para el legislador. En primer lugar, el legislador y los poderes públicos deben favorecer el marco institucional y las leyes que reduzcan al mínimo los costes de transacción, buscando permitir vía intercambio las transacciones que conduzcan al óptimo. En segundo lugar, deben diseñar las normas de manera que intenten reproducir la solución eficiente cuando los costos de transacción impiden la realización de las transacciones de mercado necesarias para llegar al óptimo (Medema, 1997).

En los años sesenta del siglo pasado, aparecen también, junto a Coase (1960), otros artículos seminales cuya impronta es clave en el devenir del Law and Economics. Es el caso de trabajos Calabresi (1961) sobre responsabilidad civil o Alchian (1965) sobre derechos de propiedad. En su trabajo sobre distribución de riegos y derecho de daños, Guido Calabresi utiliza conocimientos de la teoría económica para estudiar criterios de imputación de responsabilidades sobre los que basar el derecho de daños. En esta aportación cobra protagonismo el papel de los costes del daño y de los costes de administración del sistema. Por otra parte, el trabajo de Armen Alchian abre camino sobre trabajos que investigan los efectos económicos de los distintos tipos de propiedad, concretamente

comparando fórmulas públicas con fórmula privadas y analizándolas como alternativas de elección (posteriormente publicará con Demsetz otros trabajos desde la teoría económica sobre los derechos de propiedad).

De este modo, se constituye lo que se denominó el “nuevo Law and Economics”, en el que fueron mayoría los economistas y minoría los abogados, y que intentó abrir una nueva etapa de relaciones entre ambos campos, dejando atrás las “viejas” relaciones entre Law y Economics. En este nuevo análisis económico del derecho resultó central la obra de Richard Posner titulada *Economic Analysis of Law*, publicada en 1973.

3. COMPARATIVA DE LOS SISTEMAS DE RESPONSABILIDAD ¿OMI U OPA?

Los sistemas de responsabilidad civil además de ser, obviamente, sistemas punitivos tienen un carácter disuasorio. Su existencia incide en la disminución de los comportamientos oportunistas puesto que el hecho de tener que pagar indemnizaciones en el futuro, traslada al presente la preocupación por ello, por lo que le convierte en un mecanismo ex –ante.

Tanto los Estados Unidos como Europa poseen sendos regímenes de responsabilidad¹. En el país americano rige la Oil Polution Act (OPA 90) la cual recoge gran parte de la legislación federal en materia de responsabilidad civil. Estas medidas son complementadas por las normas aprobadas en cada Estado, las cuales matizan la cuantía del pago o la responsabilidad entre otras características. (Pintos Ager, del Olmo Garcia, 2003). Por otra parte, Europa se rige por el reglamento internacional creado por la OMI (Organización Marítima Internacional) al cual, en 2015, están adscritos 114 Estados y en el que España es miembro del comité ejecutivo desde 1991 (Baena Baena, 2004). Está basado en dos tratados principales: El Convenio Internacional sobre Responsabilidad Civil por Daños Debidos a la Contaminación por Hidrocarburos (CRC/92) y el Convenio de Constitución de un Fondo Internacional de Indemnización de Daños causados por la Contaminación por Hidrocarburos (FUND/92).

En el caso de España, la normativa recogida en ambos convenios prevalece por encima de las leyes nacionales. De hecho, fue esta la aplicada en el macro-juicio celebrado en la Audiencia Provincial de A Coruña.

En el juicio celebrado en la Audiencia Provincial de A Coruña tres acusados se sentaron en el banquillo: el capitán y el jefe de máquinas del Prestige y el Ex – director General de la Marina Mercante. Sólo se encontró culpable de un delito de desobediencia grave al capitán del barco, por negarse a que el buque fuese remolcado el 13 de noviembre de 2002, pero esta condena se limita a nueve meses de cárcel y no conllevó responsabilidad civil, por lo que no implicó el pago de daños.

¹ Aunque la comunidad internacional realizó concesiones en la redacción de los tratados del OMI a los Estados Unidos, estos declinaron, junto a Japón, formar parte del grupo de países firmantes. Aunque únicamente se apelaba a la disconformidad por lo laxo de las medidas existía otra razón: en el sistema internacional (del OMI) los Estados Federados perderían toda autoridad para encausar los procedimientos, por lo que los Estados pugnaron por no formar parte del mismo (Álvarez del Castillo Baeza, 1998).

El resultado de la sentencia dejaba sin responsables ni indemnización a una de las mayores catástrofes medioambientales de la historia de España. De los 4.328 millones de euros en daños, sólo se abonaron 151 millones provenientes del fondo de compensación FIDAC². Esto provocó que se alzaran voces críticas reclamando un endurecimiento del régimen internacional a semejanza del estadounidense. Cabe preguntarse qué sucedería si fuera efectiva la implantación de un régimen como el de la OPA en el suceso del Prestige. Para ello se realizará una comparación entre ambas legislaciones sobre responsabilidad medioambiental, analizando los puntos claves de cada convenio.

3.1. PARTES RESPONSABLES

OMI: en su artículo III atribuye la responsabilidad civil al propietario del buque frente a los damnificados. La responsabilidad en este caso es única, se excluyen a otros posibles agentes como empleados, prácticos, fletadores o tripulantes. En el caso del Prestige, Universe Maritime es la propietaria y armadora del buque, aunque figure que su propietaria, ex datos registrales, fuese la entidad Mare Shipping. El juzgado dictaminó que Universe Maritime era responsable, con carácter responsable y mancomunado, de los daños causados por la marea negra pero no fue citada. No fue posible ya que, aunque se intentó, los numerosos cambios de domicilio y la liquidación de las empresas hasta su desaparición no lo hicieron posible.

OPA 90: En el caso de que el vertido sea causado por un buque petrolero son solidariamente responsables el propietario, el operador y el fletador a casco desnudo. En la catástrofe del Prestige estos tres agentes están representados respectivamente por Mare Shipping, Universe Maritime y Crown Resources³.

3.2. LIMITACIÓN DE LAS INDEMNIZACIONES

OMI: el propietario del petrolero, como concesión a la responsabilidad objetiva atribuida, puede limitar la cuantía a pagar que depende del tonelaje del buque. El Prestige, con 42.820 toneladas gruesas (GT), se clasificaría en una capacidad de carga de hasta 5.000 unidades de toneladas de registro bruto (TRB), a las que se debe añadir por cada tonelada adicional 420 DEG. En total el fondo limitado atribuible al derrame del Prestige se cerniría entre los 22-24 millones de euros.

OPA 90: los agentes responsables, muchos más que el propietario del barco, no podrán limitar el pago de los daños del accidente si ha existido dolo o culpa atribuible a alguno de ellos. En caso de que no se pruebe esta intencionalidad se puede restringir la cuantía a la mayor de las cuantías siguientes (Pintos Ager y del Olmo García, 2003):

- 1.200\$ por TRB

² Las compañías petroleras están obligadas a destinar una pequeña parte de los ingresos por venta de hidrocarburos al Fondo de compensación. Cuando el naviero es insolvente a la indemnización imprevista es insuficiente se recurre a el (Álvarez del Castillo Baeza, 1998).

³ La propia Crown Resources declaró que la empresa solo se limitó a fletar un buque que cumplía con las normas de seguridad, dirimió cualquier responsabilidad y preguntada por ello respondió "Si usted alquila un coche, y el coche se estropea en el camino, ¿es usted responsable de ello?" (http://elpais.com/diario/2002/12/08/espana/1039302016_850215.html).

- Buques ≤ 3.000 TRB pagan 2.000.000\$ (según el tipo de cambio a 2001 2.702.860 €)
- Buques > 3.000 TRB pagan 10.000.000\$ (según el tipo de cambio a 2001 13.514.300 €) Para el Prestige la cantidad atribuible sería de 13.514.300 €.

3.3. ATRIBUCIONES DE LAS RESPONSABILIDADES

OMI: presenta una responsabilidad estricta. El único agente al que se le atribuye responsabilidad en el accidente es el propietario. Sin embargo, puede existir causas por las que no se reputa responsable al propietario del buque. Lo son la existencia de guerra y actividades relativas, el perjuicio causado por fenómenos naturales, la acción u omisión de un tercero para causar daños y la negligencia del Gobierno u otras autoridades responsables.

- *Fenómenos naturales*: el artículo III apartado 2 del CRC/92 se especifica que “No se imputará responsabilidad alguna al propietario si éste prueba que los daños (...) se debieron totalmente (...) a un fenómeno natural de carácter excepcional, inevitable e irresistible”. En el juicio existieron diversas voces que defendieron la teoría del que el hundimiento fue provocado por una ola de dimensiones considerables. Un ejemplo de ello fue el testimonio presentado por el perito Tony Browman el cual declaro: “aunque no se sabe de forma exacta lo que ocurrió, lo más probable es que una ola causase el desplome de un elemento estructural”. Sin embargo, el juez rechazó esta hipótesis en la sentencia ya que “una ola gigante o extrema que nadie vio, que nadie o nada registró y que no afectó más que a un buque, tal vez sea posible, pero no es demasiado verosímil y, desde luego, no está ni remotamente probada, razón por la cual los argumentos finales de la defensa no abundaron en esa cuestión.”

- *Acción u omisión dolosa de terceros*: el artículo III del CRC/92 se expone que “No podrá imputarse responsabilidad alguna al propietario si prueba que los daños por contaminación fueron totalmente causados por una acción u omisión intencionada de un tercero para causar daños o fueron totalmente causados por la negligencia u otro acto lesivo de cualquier Gobierno u autoridad responsable (...)” Por lo tanto, se debe probar que el propietario es enteramente culpable y no existe algún otro agente involucrado que comparta responsabilidad en el hundimiento. (Rodríguez Gayán, 2003). Cuando se asignan responsabilidades para el Prestige, puede haber dos factores claves a los que se les pueda atribuir responsabilidades.

El primero de ellos es el Gobierno por medio del ex -Director General de la Marina Mercante. Sin embargo, en la sentencia del Prestige fue absuelto del delito contra el medio ambiente y espacios naturales protegidos. Para el magistrado la decisión de alejar el barco aumentó la extensión del vertido, pero redujo la intensidad de la afectación y permitió recoger el fuel en el mar. La sentencia considera válida la actuación del ex alto cargo porque: “...Nunca se ha dicho hasta ahora cual sea la decisión correcta a tomar y el protocolo a seguir en el supuesto no desdeñable de que se repitiesen hechos similares, ni aun ahora después de una dilatada instrucción y de un largo y árido juicio, ha sido capaz nadie de señalar lo que haya de hacerse aparte de algunas opiniones particulares más o menos técnicas”.

El segundo factor está representado en la figura del capitán del barco, acusado de un delito contra el medio ambiente y desobediencia grave el cual solo fue encontrado culpable de esta última, por lo que sólo fue condenado a nueve meses de cárcel. La condena se basó en que el capitán se negó a tomar remolque a las

seis de la tarde del 13 de noviembre de 2002, cuando aún era de día y se podía hacer. Esta decisión agravó el perjuicio creado por el derrame del petrolero. Aunque fue condenado se le esgrimió de cualquier responsabilidad civil, por lo que no debió hacer frente a ninguna indemnización.

Si bien es cierto que el único culpable en el caso del Prestige (el capitán Mangouras) no debió hacer frente a ninguna negociación, también lo es que su culpabilidad dirimió de la responsabilidad de indemnizar al propietario del buque.

Esto es consecuencia de que, en el juicio, se atribuyó un comportamiento negligente a otra parte, por lo que el propietario tampoco debió pagar los daños causados por la catástrofe. De hecho, tan pronto se conoció la sentencia, la aseguradora London P&I Club, retiró los 22,5 millones de euros que depositara en el juzgado coruñés para repartir entre las víctimas⁴.

OPA 90: Según lo regulado en la OPA 90 la responsabilidad es repartida entre varios agentes: el propietario del buque, el operador, los arrendatarios de las instalaciones, los propietarios y operadores de los oleoductos, los propietarios de las instalaciones en tierra y los concesionarios de puertos en mar adentro⁵.

Asimismo, el juez, como valoración de las pruebas se basa en un discernimiento más exigente que los utilizados para los procedimientos mercantiles y civiles comunes, la llamada *preponderancia de la evidencia* (Álvarez del Castillo Baeza, 1998). En este caso lo que se necesitan son pruebas claras y convincentes de que la causa defendida es realmente cierta y no solo una duda razonable de que así lo pueda ser. Es por *preponderancia de la evidencia* que se deben probar la existencia de aquellas causas que den lugar a las excepciones de responsabilidad, como son un acto de guerra, la acción u omisión

de una tercera persona o un *Acto de Dios*⁶.

Como hemos visto en el párrafo anterior, en el caso del Prestige, la atribución de responsabilidad civil al capitán del barco dirimió de responsabilidad a su propietario. Sin embargo, en la aplicación de la OPA 90, bajo la preponderancia de evidencia se necesita tener la certeza absoluta de que la negativa a remolcar el buque provocó o acrecentó el derrame de fuel-oil. Al respecto de ello en la sentencia del Prestige se puede leer que “La responsabilidad civil exigible no puede referirse a las graves consecuencias económicas del vertido de fuel del Prestige (...) de modo que si sólo se considera acreditado el delito de desobediencia, del mismo no se deriva o con el mismo no se han causado los daños y perjuicios derivados del vertido del Prestige”. Por lo que, aplicando las

⁴ Los únicos entes que se han hecho cargo de las indemnizaciones a las víctimas han sido el Estado Español, que aportó 1.000 millones de euros, y el FIDAC, organismo internacional para daños debidos a contaminación de hidrocarburos, que destinó una partida de 151 millones de euros a paliar los daños. Esta cantidad se repartió entre los afectados que acudieron al organismo (5 millones de euros), el Estado Español (115 millones de euros) y el resto se repartió entre los Estados francés y portugués y los damnificados franceses.

⁵ Además de incluir un espectro más amplio de responsables, la OPA también distingue varios tipos de costes. Por un lado, los costes de remoción que representan la cuantía monetaria en la que se valora la descarga de petróleo y los costes para evitar y paliar los derrames de petróleo. Por otro lado se clasifican como daños los perjuicios causados por una marea negra a la propiedad privada, recursos naturales o servicios públicos (Álvarez del Castillo Baeza, 1998).

⁶ Se entiende por *Acto de Dios* un acto atribuido a la naturaleza más allá del poder de actuación del ser humano.

normas de la OPA 90, con toda probabilidad esta causa no dirimiría al propietario y a los demás agentes de su responsabilidad.

3.4. DAÑOS INDEMNIZABLES

OMI: en el art. 1.6 del Convenio por el protocolo se especifica que “la indemnización (...) estará limitada al costo de las medidas razonables de restauración” las cuales incluyen los costes de limpieza, regeneración, los daños materiales y el perjuicio económico causado a los sectores productivo. No se incluyen daños personales (Pintos Ager y del Olmo García, 2003).

OPA 90: la lista de daños indemnizables es mayor en este caso. En cuanto a los costes de limpieza y regeneración se tienen en cuenta, además de los incurridos por particulares y autoridades, los realizados por los responsables. Además, se incluyen los daños personales y a los bienes de la propiedad afectados, las pérdidas incurridas por las autoridades al dejar de percibir tasas e impuestos de los sectores afectados, los costes de servicios públicos adicionales (como remolcadores, asistencia sanitaria o prevención de incendios) y el daño causado a los recursos ecológicos por, también, su uso pasivo⁷ (Pintos Ager y del Olmo García, 2003).

4. CONCLUSIONES

El perjuicio generado por el hundimiento del Prestige constituye una catástrofe natural de importantes dimensiones económicas y ecológicas. La contaminación generada por una marea negra es un caso típico de efectos externos negativos similares a los analizados por Coase (1960). Si la economía no tiene costes de transacción positivos, los agentes involucrados negociarán y conseguirán llegar a acuerdos que permitan maximizar la producción (o el valor). Esto quiere decir que la asignación de derechos acabará en las manos de quienes más valoren esos derechos, abonando las compensaciones necesarias a los perjudicados. Pero como señala Coase (1960, 1988, 1999), cuando los costes de transacción son positivos, la asignación de derechos inicial es relevante. Como la realidad económica se caracteriza por altos costes de transacción, las leyes y las normas jurídicas juegan un papel fundamental en la asignación de la economía y, específicamente, en la resolución de problemas de externalidades.

Cuando las normas jurídicas importan, también es fundamental garantizar la aplicación de las mismas, pues las normas que no se hacen cumplir son simplemente “palabrería”, como destaca Ostrom (2004). En relación a las mareas negras, conviene señalar dos aspectos. En primer lugar, que durante las últimas décadas del siglo XX emergieron un amplio número de Convenios y Protocolos para regular el transporte de mercancías, la contaminación en el mar y las indemnizaciones y responsabilidades por contaminación marítima, y especialmente aquella derivada del transporte de hidrocarburos. Sin embargo, hay que constatar que dicha regulación todavía resulta insuficiente e incompleta, a pesar de los avances existentes, aún con los nuevos convenios aprobados después del caso Prestige. En segundo lugar, la aplicación de las normas

⁷ El valor pasivo valora monetariamente la mera existencia de un recurso natural, así como también el aprovechamiento futuro que puedan hacer las nuevas generaciones de él.

existentes es altamente imperfecta, pues exige la intervención de terceras partes (tribunales judiciales), pero estos pueden resultar incapaces de actuar en asuntos altamente complejos, con diversas jurisdicciones, con confluencia de acción de varios tribunales y ante agentes profesionalizados en intentar evitar la acción de la justicia.

Si bien es cierto que los procesos de aplicación de las normas y convenios se caracterizan por altos costes de transacción que dificultan verificar muchos hechos el proceso, también lo es que ante un sistema de responsabilidad más riguroso la comunidad naviera limita los riesgos en alta mar, constituyendo el régimen estadounidense una herramienta contra la lucha por la contaminación marítima, ex – ante y ex – post, más efectiva que el régimen internacional aplicado en Europa. Para Pintos y del Olmo (2003) el régimen de la OPA 90, desde su aprobación, ha contribuido que decreciera en un 50% el número de vertidos de más de 10.000 galones.

En la comparativa establecida en el caso del Prestige, donde las responsabilidades se solventaron muy laxamente sin aparejar pago de indemnizaciones, se observa que en el caso de que España contase con un régimen como el de la OPA 90, aplicando la *preponderancia de la evidencia* no existirían atenuantes por los que librar a los responsables. Por otra parte, los agentes involucrados en el hundimiento no se limitarían solo al propietario si no que operarios o armadores serían responsables también. Además, la cuantía de indemnización aumentaría al contabilizar en el recuento de daños los perjuicios personales, las tasas e impuestos dejados de percibir y el daño ecológico suscitado en un sentido amplio.

A pesar de las reformas acaecidas en los convenios de la OMI después de la catástrofe del Prestige, estas se caracterizan por ser insuficientes al no contar con un nivel de exigencia de igual o mayor grado que el de la OPA 90. En el caso de que otro vertido de las dimensiones del Prestige sucediera, España seguiría contando con una regulación aplicable laxa donde la atribución de responsabilidades no es la adecuada para asignar sobre quiénes y cuánto se deben soportar los costes de la contaminación.

REFERENCIAS

- ALCHIAN, A. A. (1965): Some Economics of Property Rights, *Il Politico*, 30, 816-829.
- ÁLVAREZ DEL CASTILLO BAEZA, J. (1998): La responsabilidad ambiental en el transporte de hidrocarburos por el mar. En INSTITUTO DE INVESTIGACIONES JURÍDICAS (ed.): *La responsabilidad jurídica en el daño ambiental*, Vol. 87, Universidad Nacional Autónoma de México: México.
- BAENA BAENA, P.J. (2004): Reflexiones sobre la responsabilidad civil por daños causados por contaminación marítima de hidrocarburos. *Derecho de los negocios*, 161, 5-17.
- CABALLERO, G. (2001): La Nueva Economía Institucional. *Sistema*, 156, 59-86.
- CABALLERO, G. (2002): El programa de la Nueva Economía Institucional: lo macro, lo micro y lo político. *Ekonomiaz*, 50, 230-261.
- CALABRESI, G. (1961): Some Thoughts on Risk, Distribution and the Law of Torts. *Yale Law Journal*, 68, 499-553.
- COASE, R.H. (1937): The Nature of the Firm. *Economica*, 4, 386-405.
- COASE, R.H. (1960): The Problem of Social Cost. *Journal of Law and Economics*, 3, 1-44.

- COASE, R. H. (1988): *The Firm, the Market and the Law*. University of Chicago Press: Chicago.
- COASE, R. H. (1999): An Interview with Ronald Coase. *ISNIE Newsletter* 2, (1), 3-10.
- KINGSTON, C.; CABALLERO, G. (2009): Comparing theories of institutional change. *Journal of Institutional Economics*, 5, 151-180.
- MEDEMA, S. (ed) (1997): *Coasean Economics: Law and Economics and the New Institutional Economics*. Kluwer Academic Publishers: Boston.
- MENARD, C.; SHIRLEY, M. (2005): *Handbook of New Institutional Economics*. Springer: Dordrecht.
- OSTROM, E. (2004): Rules without enforcement are but words on paper. *IHDP*, 2, 8-12.
- PINTOS AGER, J.; DEL OLMO GARCÍA, P. (2003): Responsabilidad civil por vertido de hidrocarburos. *Indret: Revista para el Análisis del Derecho*, 1.
- RODRÍGUEZ GAYÁN, E.M. (2003): Claves de derecho privado en el asunto Prestige. *Revista Española de Derecho Internacional*, LV, 117-147.
- WILLIAMSON, O. E. (1985): *The Economics Institutions of Capitalism: Firms, Markets, Relational contracting*. The Free Press: Nueva York.

MEASURING THE INTELLECTUAL CAPITAL IN RUSSIAN ENTERPRISES

CARLOS MARÍA FERNÁNDEZ-JARDÓN

Department of Applied Economics-Ecobas/University of Vigo
C / Lagoas Marcosende s / n/ 36310 Vigo

XAVIER MARTÍNEZ COBAS

Department of Financial Economics and Accounting Ecobas/University of Vigo
C / Lagoas Marcosende s / n
36310 Vigo

e-mail Carlos María Fernández-Jardón: cjardon@uvigo.es

Abstract

Intellectual capital is a source of value generating in companies. Although there are different models to try to measure the efficiency of intellectual capital, there is not yet a definitive agreement on which is the most convenient

The transition economies and, in particular, the Russian economy, have specific characteristics that condition the use of intellectual capital and may involve different ways of evaluating their impact and different conclusions regarding their valuation.

This paper attempts to measure the efficiency of intellectual capital as a generator of value in a group of Russian companies, taking into account their specific characteristics. A model for assessing the effect of intellectual capital is presented, making use of four components related to human capital, structural capital and relational capital and, based on this model, detecting the path by the Russian companies generate value by making use of the different components of intellectual capital.

Once the model is established, it is verified that human capital and the relational capital have a direct effect on the generation of value. Structural capital has an indirect effect.

Keywords: Intellectual capital, Russia, measurement models, financial data.

Thematic area 7: Economy and Business.

1. INTRODUCTION

Intellectual capital is becoming a crucial performance and long-term growth of a company factor in a knowledge-based economy, in which more and more companies identify their core competence as intangible assets rather than tangible (Hsu and Fang, 2009).

There are numerous definitions and approaches to measure the idea of intellectual capital (Bontis et al., 2000; Goebel, 2015; Kaufmann and Schneider, 2004; Sánchez et al., 2000; Stewart, 1997; Sveiby, 2010; Tawy and Tollington, 2012; Wiig, 1997). Through the contribution of different disciplines they have emerged a significant amount of measurement models (Chen et al., 2004; Goebel, 2015; Hunter et al., 2005; Mačerinskienė and Aleknavičiūtė, 2015; Mouritsen, 2009; Nazari and Herremans, 2007; Sydler et al., 2014), suggesting that a single valuation model does not fully describe the value of intangible assets such as intellectual capital. This makes them even more difficult to manage. These models have been presented with different approaches, using available information. In particular, from the accounting point of view, previous papers try to assess the intellectual capital from financial information (Clarke et al., 2011; Ghosh and Wu, 2007; Goebel, 2015; Huang, 2014; Hunter et al., 2005; Janosević et al., 2013; Sydler et al., 2014). This will be the first objective of this paper.

Normally, the criteria for selecting a model are based on a combination of simplicity and explanation of reality (Hendry, 2003; Paga, 1987). According to these criteria, this paper proposes a measurement model based on financial data, which, within the possible options, looking for some theoretical and empirical consistency and simplicity in the approach.

The model is contrasted with data of the Russian economy, so this fact will be associated with a number of additional assumptions. Russia's business environment is volatile, risky and uncertain (Gunasekaran et al., 2001; Puffer and McCarthy, 2001). In this changing environment, particularly in times of crisis, the ability of organizations to maintain and renew their competitive advantage becomes paramount. In that sense, intellectual capital is essential to this process of renewal. Accordingly, the application to this context adds more value to this work, since it allows managing aspects of intellectual capital in risk contexts, such as transition economies. In particular, in this context, the paper analyzes the possible trajectories of impact of the different components of intellectual capital on performance according to (Jardon and Martos, 2012).

As a result, this research allows to reconcile the use of financial measures for the management of intellectual capital and its antecedents in triangulated indices, and determines relationships path coefficients between constructs developed from a general conceptual model based on academic and professional literature. In addition, it assess the relative position of the participating organizations so that intellectual capital resources can be reallocated more effectively; and establish a basis for online trends, standards and intellectual capital forecasts using financial data, completing studies applied to transition economies.

The paper continues with a review of the different methods of intellectual capital and the proposal for an alternative. Then the methodology is established. After, the

model is applied to a number of Russian companies. Finally, conclusions and some management applications and practice are discussed.

2. THEORETICAL FRAMEWORK

Intellectual capital is a construct that includes intangible assets that create value in the company. The concept of intellectual capital is not observable, since being an intangible and it cannot be captured by the senses. To measure it is necessary to define clearly the concept. (Molloy et al., 2011) propose clear definition is when a construct is described accurately in four aspects: lexical, positive semantic, negative semantic and connotative (Hurley, 2008). A lexical definition clarifies the view of the concept and how this view is based on (or departs) representations in the previous literature. To clarify the meaning of the definition is useful to explain how the construct is similar to the constructs positively related (positive semantic definition) and different constructs negatively related (negative semantic definition). These definitions are vital to establish the convergent and discriminant validity. Connotative definitions help construct to clarity and advance the research in explaining future researchers the necessary and sufficient conditions that the construct must verify when intervenes in certain phenomena (Osigweh, 1989).

(Bontis et al., 2000) contains a number of definitions showing elements of these definition aspects: Intellectual capital is the term given to the combined market intangible assets, intellectual property, human-centered and infrastructure that allow the company to operate (Brookings, 1996); Intellectual capital is intellectual material, knowledge, information, intellectual property, experience that can be used to create wealth. It is a collective brainpower or useful knowledge packed (Stewart, 1997); Intellectual capital includes all processes and assets that are not normally shown on the balance sheet and all intangible assets (trademarks, patents and trademarks) that modern accounting methods considered. It includes the sum of the knowledge of its members and the practical translation of knowledge (Roos et al., 1997); The value of intellectual capital is given by the difference between the market value and book value (Roos et al., 2001).

Once defined, because it is not observable, it is appropriate to look observable indicators that show us the concept. Models to measure intellectual capital are based on its definition as a set of intangible assets that generate value for the company. and the intangible value: In this definition two difficult concepts to quantify appear. Measurements of these concepts and approaches result in different measurement models.

2.1. APPROACHES TO THE VALUATION METHODS OF INTELLECTUAL CAPITAL

Normally, there are three procedural models to measure unobservable variables: by formative indicators, by component, and by reflective indicators. Formative indicators are elements that cause the concept. By component is a direct method, i.e., observing elements whose combination defines the concept. Reflective indicators are elements consequent to the concept and caused by it, reflecting its properties (Bontis et al., 2000; Chin, 1998; Clarke et al., 2011; Molloy et al., 2011; Ringle and Sinkovics, 2009). In the case of intellectual capital, the second method usually is not feasible, since some of its components are also unobservable.

This suggests that measurement methods will be of three types: based on formative indicators (inputs), based on reflective indicators (outputs), or mixed. This classification overlaps suggested by (Lev et al., 2016).

The second aspect refers to the approach. Intellectual capital is a construct, but can be considered as a whole or analyzing its various components. This decomposition can also be used for measurement.

Traditionally, intellectual capital is divided into three categories: human capital, structural capital (organizational) capital and relational (customer) (Sydler et al., 2014).

Human capital refers to the set of values, attitudes, skills and abilities of employees that can generate value to the company (Bontis et al., 2000); (Bueno et al., 2003). Human capital includes knowledge, experience, skills, skills, creativity, teamwork, loyalty, training and education, problem solving ability, attitude, loyalty and motivation of people (Hsu and Fang, 2009) (Hormiga et al., 2011), Usually human capital is tacit knowledge (Nonaka and Takeuchi, 1995).

Structural capital is "that knowledge that internalizes company (generating value for it) and remains in the organization even when their employees leave their homes at night" (Roos et al., 1997, p42); therefore, structural capital is independent of individuals and is generally explicit knowledge (Hormiga et al., 2011). Structural capital includes intellectual property (patents, licenses, trademarks, ...) technology incorporated in the company, the organizational system, culture, etc. (Bontis et al., 2000; Bueno et al., 2003; Roos et al., 1997; Wang and Chang, 2005).

Relational capital is the value of business relationships with individuals and organizations doing business with or is related in some way to create value in the company (Bontis et al., 2000; Bueno et al., 2003; Hormiga et al., 2011). This capital includes relationships with external stakeholders, networks with suppliers, distributors, trade organizations, partners, customer relationship management (image creation, loyalty, partner and investor network) and Brands (attitude, preference, reputation, brand recognition) (Paoloni and Dumay, 2015; Santos-Rodrigues et al., 2005; Thuy et al., 2005; Welbourne and Pardo-del-Val, 2009). Usually it combines explicit and tacit knowledge.

Finally, a third aspect to consider ago regarding the sources of information used to measure intellectual capital. Initially, we could divide them into two large blocks that will condition the methods used: sources of public and private information. This division is essential, when the problem of disclosing the intellectual capital of the company is analyzed (Dumay and Cai, 2014), Since its manifestation should be done through public sources.

Public sources include data found in the reports of the companies in the commercial register, stock information and data available from different sources of economic and financial information companies' public use. Private sources are usually obtained by surveys, interviews or by direct observation of the operation of the company, although there are different qualitative methods that give indirect information on the existence of intellectual capital (Harrison and Sullivan, 2000). This paper are interested to financial public information sources.

2.2. ASSUMPTIONS ASSOCIATED WITH THE VALUATION METHODS OF INTELLECTUAL CAPITAL

The concept of intellectual capital includes a number of basic assumptions, although their use in measuring intellectual capital can be as a way to measure it or as a way to validate the measure used. The concept includes two assumptions directly related to the generation of value associated with and the relationship with intangible assets:

S1: Intellectual capital increases the performance of the company.

This assumption suggests possible reflective indicators of intellectual capital. Different performance levels that can be considered and how to measure them will condition the practical effectiveness of this assumption. However, theoretically, the assumption should be valid for all levels considered in global terms.

S2: the investments in intangible increases the intellectual capital of the company.

This assumption identifies possible formative indicators of intellectual capital. Formative indicators can also be considered at different levels, suggesting different indicators. In addition, investments can be seen in time or money; in training or recruitment specialist in experience or knowledge and technology, etc.

Previously approaches include a number of assumptions that will define the different measurement methods. In general, the typology based on inputs uses S2 to estimate intellectual capital and S1 to validate the quality of the estimators. The typology based on outputs uses S1 to estimate, and S2 to validate. The mixed typology can use to measure and validate both, using different indicators.

In the practice, each methodology have associated additional assumptions (Goebel, 2015; Janosević et al., 2013; Pulic, 2000). For example, the typology based on inputs includes an additional assumption suggesting that intellectual capital is measured by its causes. The typology based on outputs includes the assumption that intellectual capital is measured by its consequences. The mixed type adds the assumption that intellectual capital is measured by its causes and consequences.

In addition, specific assumptions for the selection of indicators are necessary. For example, the measurement models through investments adds a number of assumptions about the relationship between intellectual capital and specific investments that are used.

Each typology has limitations, according to the assumptions additionally included. They are required to pinpoint exactly what assets or other monetary manifestations associated with intellectual capital within the company, since, as the intellectual capital an intangible, unseen and therefore only its elements are detected are when used to generate value. In that sense, many models try to be comprehensive in defining all potential assets of each component of intellectual capital, especially in the methods scorecard (Hsu and Fang, 2009; Hunter et al., 2005; Janosević et al., 2013; Sveiby, 2010; Tawy and Tollington, 2012). However, always remain outside elements. In consequence, the each method usually produces a bias. Inputs based method generates a certain bias, because identifies the antecedent with the intellectual capital generated by it. The method based on outputs commits a similar bias, because identifies the value generated by intellectual capital with the intellectual capital.

The fact of considering a global or component focus also affects assumptions. From the theoretical point of view, the global focus does not require additional assumptions, but measures based on components require additional assumptions.

On the one hand, the components in which intellectual capital is divided must be indicated. Previous literature has already analyzed this problem and there are different possibilities about (Bontis et al., 2000; Bontis and Fitz-enz, 2002; Cabrita and Bontis, 2008; Jardon and Martos, 2012; Martín-de-Castro et al., 2010; Salazar and Sáez, 2006; Tawy and Tollington, 2012). On the other hand, it is necessary to indicate the aggregation system of these components to indicate jointly the intellectual capital of the company. Normally, it is assumed that the intellectual capital in the company is the sum of its components (Pulic, 2000), but other methodologies use different aggregation (Bontis, 1998) or even, some authors do not aggregate the components (Chen et al., 2004).

Finally, the available information has associated implicit assumptions. For example, the data has no measurement errors, once selected the corresponding indicator.

According to this scheme, the research suggest four steps to determine the measurement models:

1. Determine the type of indicators to be used
2. Decide the focus
3. Select information sources
4. Establish additional assumptions to define indicators

This scheme allows revising previous methods to elaborate a specific model to measure intellectual capital with financial data.

2.2. MEASURES OF INTELLECTUAL CAPITAL WITH FINANCIAL DATA

(Harrison and Sullivan, 2000) summarize the measures of intellectual capital into two main groups: qualitative and quantitative data. The latter, in turn break down into non-monetary and monetary measures. The interest of this paper is to measure intellectual capital with financial data, so only focus on the latter group suggested by these authors.

(Sveiby, 2010), summarizing previous works, suggest that the measurement methods of intellectual capital could be classified into methods of direct intellectual capital (DIC), methods of market capitalization (MCM), methods of return on assets (ROA) and methods scorecard (SC).

DIC estimates the monetary value of intangible assets by identifying its various components. Once these components are identified, they can be evaluated directly, either individually or as an aggregate coefficient. Accordingly, it is a component method. The way to measure each component may vary, although usually based on direct surveys, so this research does not use these methods, although some of his ideas may be used.

MCM calculates the difference between the market capitalization of a company and its stockholders' equity as the value of their intellectual capital or intangible assets. It is a global focus. This method will be analysed after, since it uses financial information.

ROA uses average earnings before tax for a period of time divided by the tangible assets of the company compared to the average of the industry. It presupposes

that the difference indicates the average annual gain Intangibles. The method presupposes that it is possible to estimate of the value of its intangible assets or intellectual capital by dividing the higher profits than the average for the average cost of capital of the company or an interest rate. ROA methods are a comparative method with the sector, assuming that all companies in the same sector use their intangible assets to generate returns in a similar way and that the difference in profitability between the company and the industry average is due to the use the intellectual capital of the company. This method only allows comparison within the sector but can not be made between sectors, which severely limits its use. Therefore, this paper does not use this method.

Finally, SC methods also consider the various components of intangible assets or intellectual capital identified and measured by indicators reported in scorecards or as graphs. The latter method usually is not based on monetary values, so the research does not use it, although his philosophy to measure components can be considered.

(Lev et al., 2016) suggest three approaches to measuring capital valid organizational intellectual capital: Measures based on the input of intellectual capital, ie intangible or a history of intellectual capital; Measures based on output, ie the value of the business generated by intellectual capital and survey-based measures, ie looking directly through questions the value of intellectual capital. These approaches are included in our model, coinciding in the case of inputs and outputs.

(Goebel, 2015) classifies approaches to measuring the value of intellectual capital into three groups, according to the sources of information used: investment based approaches, component-based approaches and holistic market-based approaches. According to previous classifications, the author mixes information sources (investments or market value, although both are financial) with focuses (component or global).

The investment-based approach is essentially a measure based on inputs; the components based approach can make use of inputs or surveys; the third is based on outputs. Except survey-based method, the rest make use of financial information. Some of these approaches use specific assumptions. The analysis of these assumptions help to evaluate the different alternatives proposed to establish a measurement of intellectual capital.

The investment approaches are based on the information provided by the profit account, considering expenses related to intellectual capital as investments. Consequently, this approach adds additional assumption specifying any of the previous assumptions:

SI1: The expenses associated with intangible elements are investments in intellectual capital

Thus, this assumption associates based investment approach with methods based on inputs, since the inputs are the expenses. In addition, often this approach is associated with component-based methods, since investments are associated with each of the components of intellectual capital.

(Goebel, 2015) criticizes this approach, since, among other things, considering labor costs equated to human capital as an investment rather than an expense, the question of whether to add to capital employed arises.

In parallel, criticizes the use of components. On the one hand, it is difficult to estimate the value of each component, as it rarely publishes quantitative information on individual IC components. Moreover, the interactions are not observable, so in practice are omitted, since the measures are focused on individual components (Mouritsen, 2009) When normally the interactions of the components of intellectual capital contribute significantly to the value of intellectual capital (van der Meer-Kooistra and Zijlstra, 2001).

Despite these criticisms, these methods are very often used in the literature of intellectual capital (Clarke et al., 2011; Hsu and Fang, 2009; Janosević et al., 2013; Sydler et al., 2014). In particular, one of the most popular is the model (Pulic, 2000) Which suggests Value Added Intellectual Capital™ (VAIC™) as an indicator of intellectual capital. Pulic model adds additional assumptions that make their estimate of the value generated by intellectual capital is highly questionable (Goebel, 2015; Iazzolino et al., 2014; Ståhle et al., 2011). This study uses some of its less questionable elements.

Another measure investment based on the value of intellectual capital is the capital of the organization, indicated by the category of selling, general and administration (Lev et al., 2016). The capital of the organization is described as an efficiency measure for investments in employees, systems, brands, etc. In addition, (Nazari and Herremans, 2007) suggest advertising costs as an indicator of relational capital, among other authors who use this approach.

The use of a specific indicator implies an assumption about the mean of the intellectual capital element associated with this indicator.

Holistic based on the market approaches assume that the market incorporates the intellectual capital value beyond the financial statements (Stewart, 1997; Sveiby, 1997). This approach focuses on the holistic effect of the value of intellectual capital in the value of the company, so that interactions between the components of intellectual capital are captured in the overall value. Intellectual capital investments result in higher revenues generated with an effect on the value of the company, as argued (Penman, 2009) Even if they go beyond financial information.

This approach also has an associated assumption had already been considered in the work of (Stewart, 1997)

SH1: the intellectual capital of the company is the difference between the market capitalization of a company and its stockholders' equity

According to this assumption, in this approach, the objectives are completely different and how to measure intellectual capital is oriented towards finding indicators that measure the difference between market value and book value of the company. Different indicators to measure this increase give rise to different measurement models intellectual capital. (Goebel, 2015) In particular analyzes these indicators and establishes a number of assumptions about the quality of one or the other. The consequence of this assumption is that intellectual capital with the value it generates, becoming a tautology the definition of intellectual capital is identified. Moreover, this assumption includes all the market value generated is due to intellectual capital, without taking into account the possible influence of tangible assets as multiplying the value in interacting with other assets.

The preliminary analysis indicates that the measures used condition the measured amount of intellectual capital and, consequently, the evaluation of this intellectual

capital within the company and the impact it could have on value creation.

The aim of this study is to measure intellectual capital with public financial data that establish indicators for decision-making by the manager and, while estimating the efficiency of each of these indicators to have information how it should be the impact that the use of this indicator generates on the results of the company.

The approach followed combine inputs and outputs, so formative indicators of intellectual capital of the company and the impact that produced these formative indicators on the consequences of the intellectual capital (reflective indicators). In particular , the study uses the expenses as formative indicators and value added of the company as reflective indicator (Chen et al., 2004; Goebel, 2015; Huang, 2014; Pulic, 2000).

Summarizing the previous papers, this paper makes the following assumptions:

A1 creating value in the company is based on the use of investment in tangible or intangible resources and intellectual capital resources

A2 efficiency of a resource is associated with the ability of this resource is to increase the added value of the company

A3: the intellectual capital of the company positively affects all different performance indicators

Complementarily assumptions about each of the indicators must verify:

A4 investments in human capital are included in staff costs because the higher this starting greatest amount of human capital is assumed is hiring either intensively by the quality of this or either extensively by the number

A5. Similarly other expenses aimed at improving how resources can be intangible costs of R & D are associated with structural capital of the company

A6. Business expenses, advertising and those used for investments in corporate social responsibility and other aspects of relations with society with customers or suppliers are related to the relational capital of the company

A7. The increase in intangible assets is related to the amount of intellectual capital generated in the company since it includes all the stock of intangible assets accumulated up to the current period.

According to these assumptions we can establish a pattern of paths, where different indicators of investment in each component of intellectual capital and intellectual capital affect this ultimately it affects the performance manifested in the creation of value in the company (see Figure 1).

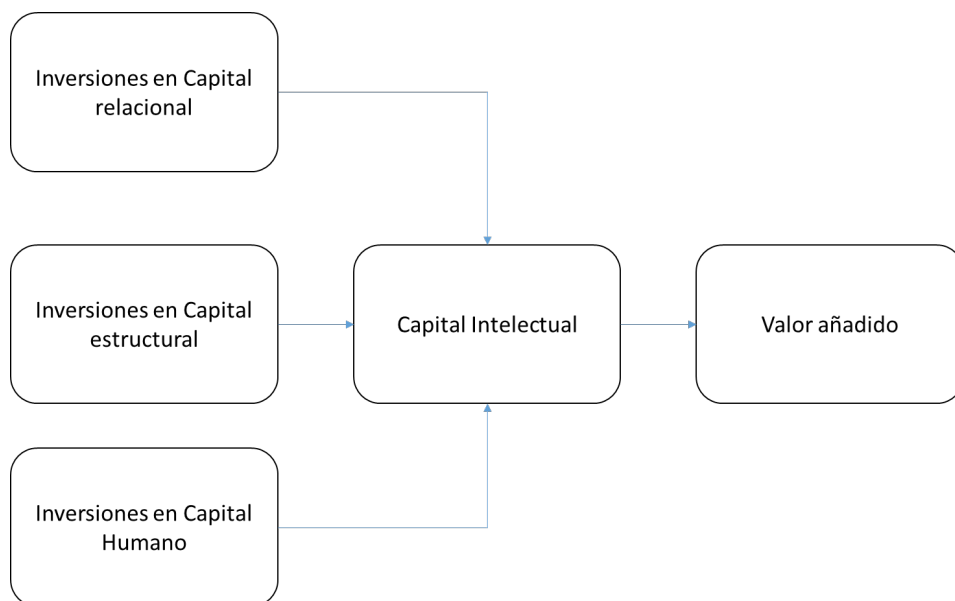


Figure one: Model estimation of intellectual capital

Russian context

The context can influence the measurement model of intellectual capital. The business environment in Russia is uncertain and risky (Gunasekaran et al., 2001) and volatile (Puffer and McCarthy, 2001) as a result of the weak legitimacy of formal institutions. Puffer et al. (2010) criticized these institutions for being ineffective, considering that the pressure from government officials and others undermined both business and country systems (Ledeneva, 2008).

Possibly, a cause of persistent weaknesses in formal institutions was increasingly active state role in business (Puffer and McCarthy, 2007), although other authors have accentuated the weakness of property rights (Levin and Satarov, 2000). (Woodruff, 2004) notes that this weakness is a result of the privatization process, which also left a relatively inefficient market capital and underdeveloped (Kogut and Spicer, 2002). Those weaknesses of formal institutions in Russia have created a vacuum that generally has been filled by traditional and informal institutions that have influenced the way of making business decisions (Puffer et al., 2010). However, these informal activities have increasingly become formal over time (Kim and Kang, 2009)

In addition, it was found that the vast majority of entrepreneurs did not operate on a fully legitimate basis in the sense that they had not registered their businesses, had no license to trade and performed much of their business off the books (Williams and Round, 2008). Although small informal businesses can circumvent government regulations and taxes, as they grow, they risk being more visible, creating disincentives to expand beyond a certain size (Snodgrass and Biggs, 1996).

After advancing towards the development of a more market-oriented economy and a cuasicapitalista system, Russia has regressed to a more capitalist system administered by the state and a mixed economy (McCarthy and Puffer, 2013). The

evolution of the incomplete trip in Russia towards a market economy has been analyzed by identifying four distinct but overlapping stages: market capitalism, oligarchic capitalism, siloviki capitalism and finally managed network capitalism by state (Puffer and McCarthy, 2007). Companies are interrelated within these four phases, hindering a common analysis of all of them.

There are few articles on intangibles and strategic behavior of Russian companies (Andreeva and Garanina, 2016; Butler and Purchase, 2008; Molodchik and Jardon, 2017; Tovstiga and Tulugurova, 2009). Typically, researchers have focused on how companies in Russia develop their innovation strategies. (Gurkov, 2004) showed the situation of innovation of Russian industrial enterprises, classifying them into four groups according to innovation level. (Kuznetsova and Roud, 2014) considered the relationship between competitiveness and innovative behavior of Russian companies, pointing to four profiles of companies. The study of (Gokhberg and Roud, 2016) describes seven different groups of Russian companies based on various effects of innovation for industrial companies for a period of 10 years.

Generally, the peculiarities of Russian companies do not all investments in intellectual capital components directly generate intellectual capital. Some do it through other components.

Managers generally have cognitive rigidity (May et al., 2007), leading them to a certain resistance to change by Russian employees (Michailova, 2000). In addition, Russians managers and employees tend to show lower levels of transformational leadership, especially the charisma and inspirational motivation, than their counterparts in other areas (Ardichvili, 2001).

Strategic orientation towards innovation is low, as insufficient levels of investment in innovation indicate a lack of confidence in the business environment, lack of management experience or even the belief that competitive products often do not guarantee sales (Filippov, 2011).

Culture is very important in the business environment of Russian companies (Gaenslen, 1986). People are much more important than the rules in Russia. Personal relationships are critical for information, share opinions and do business. Therefore, it is important to have a wide network of contacts (not only government officials). In other words, social capital is a critical asset in Russia (Fey and Shekshnia, 2011). However, this culture does not show a clear orientation towards innovation, since there is often little involvement of employees in collective decision making (Jumpponen et al., 2008). This means that, in general, investments in innovation have no direct effect on the generation of intellectual capital.

Leadership in Russian companies is different from other countries. For example, (Kets de Vries et al., 2004) emphasize that Russian leaders have a particular style of charisma and wield more power than their Western counterparts. In fact, usually they do not want to lose control of the company. Even after choosing a successor CEO, the founders of many Russian companies try to keep this power giving only the title, but continuing in the direction of the company in the background (Shekshnia, 2008). Moreover, Russian companies show a limited central planning with decentralized decision-making (Valieva, 2014). (Green et al., 1996) found that Russian entrepreneurs had a stronger internal control and less powerful belief than other countries to control their economic destiny. Further, (McCarthy and Puffer,

2013) indicate that employee participation in decision-making is low. All this points to the importance of human capital investments to generate value.

This means that, even if a company has capacity for innovation, needs trained human resources to carry out that capacity, through either acquisition or internal training of human resources; therefore, is necessary generate human capital for capacity for innovation has an effect on performance. This suggests

P1: Investments in innovation need human capital to increase the intellectual capital of the company in the Russian context

On the other hand, social networks are important business opportunities for Russian companies. This is because people whose relatives or friends are entrepreneurs are more likely to become entrepreneurs, while expanding the domestic and international market potential of these companies. There are several similarities between Russian and Chinese entrepreneurs in the use of these networks according to their content capital (Djankov et al., 2006). These networks allow inclusion in global production chain, encouraging foreign investment and opening foreign markets for Russian companies (Golikova et al., 2012). These social networking and interaction with foreign companies open avenues for innovations to become enterprise value, so this suggests:

P2: Investments in innovation need relational capital to increase the intellectual capital of the company in the Russian context

These two propositions change slightly the measurement model of intellectual capital in Russian companies, leading to a process where investments in structural capital increase intellectual capital through investments in human capital or relational capital, as shown in Figure 2.

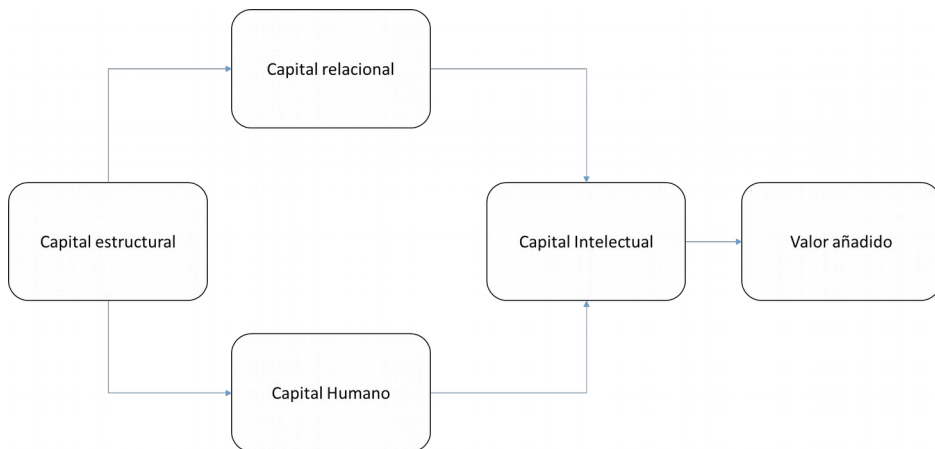


Figure two: Final Model

3. METHODOLOGY

3.1. RUSLANA DATA SOURCE

The sample of the study population contains annual data from 1,096 Russian companies for the period 2004-2014 or 12,056 observations firm years. The data set of panel does not include active companies (from January 2004) listed with annual reports, obtained from the database of Ruslana provided by Bureau Van Dijk, covering at least seven years period analyzed. It presents all economic sectors and corresponds to the distribution industry in Russia, classified into the following groups: 1 - construction and real estate; 2 - manufacture; 3 - and chemical energy; 4 - services; 5 - trade and related services; 6 - Finance and insurance. Manufactured goods account for 25% of the companies studied,

3.2. MEASUREMENTS OF VARIABLES

Following previous assumptions, paper uses the cost as an indicator of investments in intellectual capital (Pulic, 2000)(Fernandez et al., 2000)(Sydler et al., 2014). Therefore, personnel costs are an indicator of investment in human capital (Bontis and Fitz-enz, 2002); the costs of R & D an indicator of structural capital (Andrikopoulos, 2005) advertisement expenses and an indicator of relational capital (Nazari and Herremans, 2007).

Personnel costs as an indicator of human capital has been used previously in the literature, for example in the VAIC model (Pulic, 2000). It includes the amount of human resources, although each of them contribute little human capital and the quality of human capital, since it may include a few very high salaries. However, does not discriminate between one aspect and the other, making it difficult to detect that aspect of human capital is more important. In addition, there are aspects of human capital, for example, level of education, values and attitudes or some capabilities that are not usually valued in the labor market directly. Consequently, they are not included in personnel costs.

The fact of using spending on R & D as the sole indicator of structural capital is very limited, since many aspects of this capital, such as culture, technology, organizational system, etc. that are not included in those costs. However, it is an indicator, since it is assumed that companies investing in R & D have better organization to engulf those investments have a culture of innovation and try to have a technology that allows the use of those investments.

The use of advertisement expenses as an indicator of relational capital shows that the company makes an effort to improve their sales and, in that sense, try to improve relations with customers. However, other aspects of relational capital, such as the relationship with suppliers, the company image, alliances and cooperation networks, etc. are not included. Again, this indicator is assuming that if the company makes an effort to improve customer related, will be making efforts to improve other aspects of relational capital.

Intangible assets consist of rights capable of economic assessment, which are identifiable, which are not monetary and lacking physical appearance. In addition, they must meet the definition of an asset, ie that control over it, which can be measured reliably and have capacity to bring economic benefits will be.

(Amador Fernández and Romano Aparicio, 2013) They point out that to meet this feature must meet two conditions:

- they are separable, that is, they can be sold, transferred or delivered for exploitation, leased or exchanged, either individually or together with other assets or liabilities to which relates.
- Arising from legal or contractual rights, whether they are transferable or separable from the company.

Consequently, many of the elements of intellectual capital of the company can hardly be incorporated into this concept, since the requirement of identifiability in intangible assets means that when an asset is not produced and not paid explicitly for such asset, as is the case of goodwill, issues such as customer loyalty, reliance on suppliers, etc., is not separable. Even if all conducive to attaining future cash flows but which can hardly be separated to be no contract law that allows separate register (Amador Fernández and Romano Aparicio, 2013).

However, assuming a certain proportionality between what is and what is not identifiable intangible assets use as an indicator of the stock of intellectual capital used by the company to generate value.

Finally, it makes use of value added, measured by revenue minus current cats as an indicator of value in the company (Pulic, 2000).

As a control variable the sector activity include, but how to control the variable will be included in the methodology chosen (Goebel, 2015).

To eliminate the effect of firm size (Ribeiro Soriano and Castrogiovanni, 2010), All variables are introduced divided by total assets.

3.3. ECONOMETRIC METHODOLOGY

The research uses hierarchical linear models (HLM) as an appropriate method to reveal the effect of intellectual capital on value added, considering the industry, taking into account the nested nature of the data. HLM allows more precise relations between different levels of data modeling, while supporting complex structures for residual terms (Aguinis and Molina-Azorín, 2015; Bamiatzi et al., 2016). This method introduces the industry as control variable to consider different levels.

4. RESULTS AND DISCUSSION

The annex indicates the mean and standard deviation of the variables used by each of the industrial sectors. It shows that, on average, total assets of the energy sector are much higher than the rest, because Russian companies of this industry tend to be larger.

Table 1 includes the results of the estimation of the relationships established in the model. In the first part of the table, it notes that intangible assets have a positive and multiplier effect on the generation of added value, that is, for each increase of 1% in the ratio of total assets intangible assets and increases the ratio of value added to total assets by 1.21%; i.e., value added is multiplies by 1.21. This suggests the multiplicative capacity of intellectual capital investments in these companies. This result confirms the A2 and A3 assumptions, coinciding with

multiple previous work (Clarke et al., 2011; Hsu and Fang, 2009; Janosević et al., 2013; Pulic, 2000; Sydler et al., 2014).

The second part of the table shows the effect of investments in intellectual capital components on the generation of intangible assets in the company. Practically the effect of both personal and advertisements expenses is similar, increasing by 0.03% for each percentage point of these expenses on total assets. In both cases, the effect is very significant. This result shows the importance of investments in intellectual capital components to increase the intellectual capital of the company, thereby justifying the different investment policies in this asset class. This result accepts the assumptions A4-A6 shows the validity of the assumption A1. These results indicate the validity of the models based on inputs (Bontis et al., 2000; Bontis and Fitz-enz, 2002; Cabrita and Bontis, 2008; Jardon and Martos, 2012; Lev et al., 2016; Martín-de-Castro et al., 2010; Salazar and Sáez, 2006; Tawy and Tollington, 2012) as potential indicators of intellectual capital.

The combination of these two results indicate that the model in Figure 1 is valid for the companies analyzed and possibly generalizable to other companies, coinciding with (Clarke et al., 2011; Jardon and Martos, 2012; Khaliq et al., 2015; Seleim et al., 2004).

Finally, the last part of the table shows the effect of R & D expenditure on personnel costs and advertisements expenses, i.e., if investments in structural capital improve investment in human capital and relational capital company. The results indicate that only the first of these relationships is significant, i.e., an increase of R & D expenses implies an increase in personnel expenses, but not advertisements expenses. This suggests that investments in R & D always require a commitment to have more qualified human resources, which involves increasing these expenses. Only when both are combined, the intangible assets of the company are increased, i.e., the generation of specific performance.

This effect is not observed with advertisements expenses, possibly because they are geared primarily to increased sales and not to increase cooperative relations and other results that could generate long-term innovation (Golikova et al., 2012).

These results indicate the validity of the specific proposal of the Russian context P1, while the proposition P2 is not verified. In particular, the fact that investments in R & D support not directly affect jobs (Filippov, 2011), Suggesting downward orientation towards innovation of these companies. The fact that human resource needed to generate value supports the importance of strengthening the management teams results (Kets de Vries et al., 2004).

Table 1 Effects of intellectual capital

Dep: value added				
variables	Coef.	Std. Err.	z	P> z
intangible assets	1.218	0.016	73.97	0
_const	0.115	0.045	2.56	0.011
Dep: Intangible assets				
Personal expenses	0.034	0.004	0.034	0
Commercial expenses	0.032	0.004	0.032	0
_const	0.187	0.033	0.187	0
Dep: Personal Expenses				
R & D expenses	1.314	0.017	77.97	0
_const	0.203	0.030	6.67	0
Dep: Business Expenses				
R & D expenses	0.010	0.022	0.46	0645
_const	0.062	0.018	3.37	0,001

5. CONCLUSIONS

This paper presents a model that tries to measure intellectual capital of companies using financial data. To do this, a number of basic assumptions are set, after analyzing the different measurement models used in previous literature. The indicators obtained are mere indicators, i.e., does not include all the contents of intellectual capital found in the company. However, they suggest which companies have more intellectual capital and how they are used to generate value (Bontis, 1998; Chen et al., 2004, 2015; Firer and Mitchell Williams, 2003; Goebel, 2015; Huang, 2014; Labra and Sánchez, 2013; Lin and Edvinsson, 2012; Liu, 2006; Mouritsen, 2009; Nazari and Herremans, 2007; Petty and Guthrie, 2000; Rooney and Dumay, 2016).

The results show, first, that intangible assets can be considered as a good indicator of the stock of intellectual capital of the company. Second, it shows that investments in human capital, structural capital and relational capital increase in the intellectual capital of the company (Iazzolino et al., 2014; Nazari and Herremans, 2007; Pulic, 2000; Sydler et al., 2014).

This model is applied to a set of Russian companies. Given the particularities of this context (Puffer et al., 2016), some additional assumptions in the form of propositions which condition the empirical estimation to check the validity of the model are added.

The results show that the indicators established to evaluate the intellectual capital of Russian companies meet all the requirements imposed by the previous assumptions. In consequence, they can be accepted as indicators of intellectual capital, justifying models based on inputs or investments as potential indicators of intellectual capital (Iazzolino et al., 2014; Nazari and Herremans, 2007; Pulic, 2000; Sydler et al., 2014).

According to the characteristics of the Russian context, these three types of investments not all have direct effect on stock intellectual capital. In fact, the results show that only investments in human capital and generate more business expenses stock of intellectual capital. However, it is noted that investments in R & D produce an increase in investments in personnel expenses and through these, therefore, increase the stock of intellectual capital that generate more value added (Molodchik and Jardon, 2017; Ustinova and Ustinov, 2014; Volkov and Garanina, 2010).

The article presents a number of findings that suggest practical implications for two types of agents. On the one hand, for academics, specialists in accounting and intellectual capital analysts suggested that intangible assets is a potential indicator of the stock of intellectual capital, although, being an accounting concept limits their use. However, as an indicator to compare companies and as a way to discover the existing intellectual capital in enterprises can serve, given the need to discover the intellectual capital of enterprises (Cuozzo et al., 2017; Dumay and Cai, 2015; van der Meer-Kooistra and Zijlstra, 2001; Tawy and Tollington, 2012). In addition, according to previous literature (Hsu and Fang, 2009; Hunter et al., 2005; Sydler et al., 2014), Is sampling to consider expenses such as intellectual capital investments is a valid economies in transition strategy.

Moreover, there are a number of implications for advisors and managers of companies, especially in the field of transition countries. Investments in intellectual capital are important, but the key investments relate to human resources and human capital. This suggests that training policies, hiring well-trained human resource management and overall adequacy of the capabilities of these resources to the company strategy will be essential value generators in the present circumstances (Harrison and Lewellyn, 2004; Kets de Vries et al., 2004; Klochikhin, 2012; Molodchik and Jardon, 2017).

This paper presents some limitations that may slow its generalization to other settings. For example, the indicators of intellectual capital are limited by the available information, making other indicators of interest may have been outside the studio. In particular the use of intangible assets as a measure of the stock of intellectual capital is limited by the accounting concept of these assets, which does not include many other elements of intellectual capital. Finally, the data are limited to the Russian economy, so its generalization to other economies should be hired.

REFERENCES

- AGUINIS, H. AND MOLINA-AZORÍN, J.F. (2015), "Using multilevel modeling and mixed methods to make theoretical progress in microfoundations for strategy research", *Strategic Organization*, Vol. 13 No. 4, pp. 353–364.
- AMADOR FERNÁNDEZ, S. AND ROMANO APARICIO, J. (2013), *Manual Del Nuevo Plan General Contable*, 2nd ed., Centro de Estudios Financieros, Madrid.

- ANDREEVA, T. AND GARANINA, T. (2016), "Do all elements of intellectual capital matter for organizational performance? Evidence from Russian context", *Journal of Intellectual Capital*, Emerald Group Publishing Limited, Vol. 17 No. 2, pp. 397–412.
- ANDRIKOPOULOS, A. (2005), "The real-options approach to intellectual capital analysis: a critique", *Knowledge and Process Management*, Vol. 12 No. 3, pp. 217–224.
- ARDICHVILI, A. (2001), "Leadership styles and work-related values of managers and employees of manufacturing enterprises in post-communist countries", *Human Resource Development Quarterly*, Jossey-Bass Publishers, Vol. 12 No. 4, p. 363.
- BAMIATZI, V., BOZOS, K., CAVUSGIL, S.T. AND HULT, G.T.M. (2016), "Revisiting the firm, industry, and country effects on profitability under recessionary and expansion periods: A multilevel analysis", *Strategic Management Journal*, Wiley Online Library, Vol. 37 No. 7, pp. 1448–1471.
- BONTIS, N. (1998), "Intellectual capital: an exploratory study that develops measures and models", *Management Decision*, MCB UP Ltd, Vol. 36 No. 2, pp. 63–76.
- BONTIS, N. AND FITZ-ENZ, J. (2002), "Intellectual capital ROI: a causal map of human capital antecedents and consequents", *Journal of Intellectual Capital*, Vol. 3 No. 3, pp. 223–247.
- BONTIS, N., KEOW, W.C.C. AND RICHARDSON, S. (2000), "Intellectual capital and business performance in Malaysian industries", *Journal of Intellectual Capital*, MCB UP Ltd, Vol. 1 No. 1, pp. 85–100.
- BROOKING, A. (1996), *Intellectual Capital*, International Thompson Business Press, London, UK.
- BUENO, E., ARRIEN, M., RODRIGUEZ, O. AND OTHERS. (2003), *Modelo Intellectus: Medición y Gestión Del Capital Intelectual*, No. 5, Documentos Intellectus, Vol. 5, Madrid.
- BUTLER, B. AND PURCHASE, S. (2008), "Use of social capital among Russian managers of a new generation", *Industrial Marketing Management*, Vol. 37 No. 5, pp. 531–538.
- CABRITA, M.D.R. AND BONTIS, N. (2008), "Intellectual capital and business performance in the Portuguese banking industry", *International Journal of Technology Management*, Vol. 43 No. 1/2/3, p. 212.
- CHEN, J., ZHAO, X. AND WANG, Y. (2015), "A new measurement of intellectual capital and its impact on innovation performance in an open innovation paradigm", *International Journal of Technology Management*, Inderscience Publishers, Vol. 67 No. 1, pp. 1–25.
- CHEN, J., ZHU, Z. AND YUAN XIE, H. (2004), "Measuring intellectual capital: a new model and empirical study", *Journal of Intellectual Capital*, Emerald Group Publishing Limited, Vol. 5 No. 1, pp. 195–212.
- CHIN, W.W. (1998), "Commentary Issues and Opinion on Structural Equation Modeling Clear Reporting", edited by Marcoulides, G.A. *Modern Methods for Business Research Methodology for Business and Management*, Lawrence Erlbaum Associates Publishers, Mahwah, NJ., Vol. 22 No. 1, pp. vii–xvi.
- CLARKE, M., SENG, D., WHITING, R.H., BONTIS, N., KEOW, W.C.C. AND RICHARDSON, S. (2011), "Intellectual capital and firm performance in Australia", *Journal of Intellectual Capital*, MCB UP Ltd, Vol. 12 No. 4, pp. 505–530.
- CUOZZO, B., DUMAY, J., PALMACCIO, M. AND LOMBARDI, R. (2017), "Intellectual capital disclosure: a structured literature review", *Journal of Intellectual Capital*, Emerald Publishing Limited, Vol. 18 No. 1, pp. 9–28.
- DJANKOV, S., QIAN, Y., ROLAND, G. AND ZHURAVSKAYA, E. (2006), "Entrepreneurship in China and Russia Compared", *Journal of the European Economic Association*, Vol. 4 No. 2–3, pp. 352–365.

- DUMAY, J. AND CAI, L. (2014), "A review and critique of content analysis as a methodology for inquiring into IC disclosure", *Journal of Intellectual Capital*, Vol. 15 No. 2, pp. 264–290.
- DUMAY, J. AND CAI, L. (2015), "Using content analysis as a research methodology for investigating intellectual capital disclosure: A critique", *Journal of Intellectual Capital*, Vol. 16 No. 1, available at:<http://doi.org/10.1108/JIC-04-2014-0043>.
- FERNANDEZ, E., MONTES, J.M. AND VAZQUEZ, C.J. (2000), "Typology and strategic analysis of intangible resources A resource-based approach", *Technovation*, Vol. 20, pp. 81–92.
- FEY, C.F. AND SHEKSHNIA, S. (2011), "The key commandments for doing business in Russia", *Organizational Dynamics*, Pergamon, Vol. 40 No. 1, pp. 57–66.
- FILIPPOV, S. (2011), "Emerging Russian Multinationals: Innovation, Technology, and Internationalization", *Journal of East-West Business*, Taylor & Francis Group, Vol. 17 No. 2–3, pp. 184–194.
- FIRER, S. AND MITCHELL WILLIAMS, S. (2003), "Intellectual capital and traditional measures of corporate performance", *Journal of Intellectual Capital*, Vol. 4 No. 3, pp. 348–360.
- GAENSLER, F. (1986), "Culture and decision making in China, Japan, Russia, and the United States", *World Politics*, Cambridge Univ Press, Vol. 39 No. 01, pp. 78–103.
- GHOSH, D. AND WU, A. (2007), "Intellectual capital and capital markets: additional evidence", *Journal of Intellectual Capital*, Emerald Group Publishing Limited, Vol. 8 No. 2, pp. 216–35.
- GOEBEL, V. (2015), "Estimating a measure of intellectual capital value to test its determinants", *Journal of Intellectual Capital*, Vol. 16 No. 1, pp. 101–120.
- GOKHBERG, L. AND ROUD, V. (2016), "Structural changes in the national innovation system: longitudinal study of innovation modes in the Russian industry", *Economic Change and Restructuring*, Springer US, Vol. 49 No. 2–3, pp. 269–288.
- GOLIKOVA, V., GONCHAR, K. AND KUZNETSOV, B. (2012), "Does international trade provide incentives for efficient behaviour of Russian manufacturing firms?", *Post-Communist Economies*, Vol. 24 No. 2, pp. 277–289.
- GREEN, R., DAVID, J., DENT, M. AND TYSHKOVSKY, A. (1996), "The Russian entrepreneur: a study of psychological characteristics", *International Journal of Entrepreneurial Behaviour & Research*, MCB UP Ltd, Vol. 2 No. 1, pp. 49–58.
- GUNASEKARAN, A., PATEL, C. AND TIRTIROGLU, E. (2001), "Performance measures and metrics in a supply chain environment", *International Journal of Operations & Production Management*, Emerald Group Publishing Limited, Vol. 21 No. 1/2, pp. 71–87.
- GURKOV, I. (2004), "Business innovation in Russian industry", *Post-Communist Economies*, Taylor and Francis Ltd, Vol. 16 No. 4, pp. 423–438.
- HARRISON, D.S. AND LEWELLYN, P.G. (2004), "Russian management training programs: do corporate responsibility topics have a place?", *Management Accounting Quarterly*, Vol. 5 No. 4, pp. 25–36.
- HARRISON, S. AND SULLIVAN, P.H. (2000), "Profiting from intellectual capital", *Journal of Intellectual Capital*, MCB UP Ltd, Vol. 1 No. 1, pp. 33–46.
- HENDRY, D.F. (2003), "J. DENIS SARGAN AND THE ORIGINS OF LSE ECONOMETRIC METHODOLOGY", *Econometric Theory*, Cambridge University Press, Vol. 19 No. 03, pp. 457–480.
- HORMIGA, E., BATISTA-CANINO, R.M. AND SÁNCHEZ-MEDINA, A. (2011), "The role of intellectual capital in the success of new ventures", *International Entrepreneurship and Management Journal*, Springer US, Vol. 7 No. 1, pp. 71–92.

- HSU, Y.-H. AND FANG, W. (2009), "Intellectual capital and new product development performance: The mediating role of organizational learning capability", *Technological Forecasting and Social Change*, Elsevier Inc., Vol. 76 No. 5, pp. 664–677.
- HUANG, S.-Y. (2014), "Intellectual Capital measures: Literature review", *Management of Engineering & Technology (PICMET)*, 2014 Portland International Conference On, Vol. 15, IEEE, Portland, pp. 8–21.
- HUNTER, L., WEBSTER, E. AND WYATT, A. (2005), "Measuring Intangible Capital: A Review of Current Practice", *Australian Accounting Review*, Vol. 15 No. 36, pp. 4–21.
- HURLEY, P.J. (2008), "Language: Meaning and definition", in Hawes, W., Stockstil, P. and Lee, K. (Eds.), *A Concise Introduction to Logic*, Thomson Wadsworth., Belmont, CA., CA., pp. 74–112.
- IAZZOLINO, G., LAISE, D. AND MIGLIANO, G. (2014), "Measuring value creation: VAIC and EVA", *Measuring Business Excellence*, Vol. 18 No. 1, pp. 8–21.
- JANOSEVIĆ, S., DZENOPOLJAC, V. AND BONTIS, N. (2013), "Intellectual Capital and Financial Performance in Serbia", *Knowledge and Process Management*, Vol. 20 No. 1, pp. 1–11.
- JARDON, C.M. AND MARTOS, M.S. (2012), "Intellectual capital as competitive advantage in emerging clusters in Latin America", *Journal of Intellectual Capital*, Emerald Group Publishing Limited, Vol. 13 No. 4, pp. 457–484.
- JUMPPONEN, J., IKÄVALKO, M. AND PIHKALA, T. (2008), "Management and change in turbulent times: How do Russian small business managers perceive the development of their business environment?", *Journal of Business Economics and Management*, Taylor & Francis Group, Vol. 9 No. 2, pp. 115–22.
- KAUFMANN, L. AND SCHNEIDER, Y. (2004), "Intangibles: A synthesis of current research", *Journal of Intellectual Capital*, Vol. 5 No. 3, pp. 366–388.
- KETS DE VRIES, M., SHEKSHNIA, S., KOROTOV, K. AND FLORENT-TREACY, E. (2004), "The New Global Russian Business Leaders":, *European Management Journal*, Vol. 22 No. 6, pp. 637–648.
- KHALIQUE, M., BONTIS, N., ABDUL NASSIR BIN SHAARI, J. AND HASSAN MD. ISA, A. (2015), "Intellectual capital in small and medium enterprises in Pakistan", *Journal of Intellectual Capital*, Emerald Group Publishing Limited, Vol. 16 No. 1, pp. 224–238.
- KIM, B.-Y. AND KANG, Y. (2009), "The informal economy and the growth of small enterprises in Russia 1", *Economics of Transition*, Vol. 17 No. 2, pp. 351–376.
- KLOCHIKHIN, E.A. (2012), "Russia's innovation policy: Stubborn path-dependencies and new approaches", *Research Policy*, Vol. 41 No. 9, pp. 1620–1630.
- KOGUT, B. AND SPICER, A. (2002), "Capital market development and mass privatization are logical contradictions: lessons from Russia and the Czech Republic", *Industrial and Corporate Change*, Vol. 11 No. 1, pp. 1–37.
- KUZNETSOVA, T. AND ROUD, V. (2014), "Competition, Innovation, and Strategy", *Problems of Economic Transition*, Vol. 57 No. 2, pp. 3–36.
- LABRA, R. AND SÁNCHEZ, M.P. (2013), "National intellectual capital assessment models: a literature review", *Journal of Intellectual Capital*, Vol. 14, available at:<http://doi.org/10.1108/JIC-11-2012-0100>.
- LEDENEVA, A. (2008), "Blat and Guanxi: Informal Practices in Russia and China", *Comparative Studies in Society and History*, Cambridge University Press, Vol. 50 No. 01, pp. 118–144.
- LEV, B., RADHAKRISHNAN, S. AND EVANS, P.C. (2016), *Organizational Capital*, No. 1, Measuring and Managing Enterprise Intangibles, New York, available at:<http://doi.org/10.7551/mitpress/8484.003.0007>.

- LEVIN, M. AND SATAROV, G. (2000), "Corruption and institutions in Russia", *European Journal of Political Economy*, Vol. 16 No. 1, pp. 113–132.
- LIN, C.Y.-Y. AND EDVINSSON, L. (2012), "National intellectual capital model and measurement", *International Journal of Knowledge-Based Development*, Inderscience Publishers Ltd, available at: <http://www.inderscienceonline.com/doi/abs/10.1504/IJKBD.2012.045570> (accessed 25 January 2016).
- LIU, C.C. (2006), "Developing measurements of intellectual capital in the e-learning platform industry by the analytic hierarchy process", *International Journal of Innovation and Learning*, Vol. 3 No. 4, p. 374.
- MAČERINSKIENĖ, I. AND ALEKNAVIČIŪTĖ, R. (2015), "Comparative Evaluation of National Intellectual Capital Measurement Models", *Verslas: Teorija Ir Praktika*, Vol. 16 No. 1, pp. 1–14.
- MARTÍN-DE-CASTRO, G., DELGADO-VERDE, M., LÓPEZ-SÁEZ, P. AND NAVAS-LÓPEZ, J.E. (2010), "Towards 'An Intellectual Capital-Based View of the Firm': Origins and Nature", *Journal of Business Ethics*, Vol. 98 No. 4, pp. 649–662.
- MAY, R.C., STEWART, W.H., MCCARTHY, D.J., PUFFER, S.M. AND LEDGERWOOD, D.E. (2007), "A test of the cross-cultural equivalency of the resistance to change scale in Russia and Ukraine.", *Academy of Management Proceedings*, Academy of Management, Vol. 2007 No. 1, pp. 1–6.
- MCCARTHY, D.J. AND PUFFER, S.M. (2013), "Business and management in Russia: a review of the post-Soviet literature and future research directions", *European Journal of International Management*, Vol. 7 No. 1, pp. 74–111.
- VAN DER MEER-KOOISTRA, J. AND ZIJLSTRA, S.M. (2001), "Reporting on intellectual capital", *Accounting, Auditing & Accountability Journal*, MCB UP Ltd, Vol. 14 No. 4, pp. 456–476.
- MICHAILOVA, S. (2000), "Contrasts in culture: Russian and Western perspectives on organizational change.", *Academy of Management Perspectives*, Academy of Management, Vol. 14 No. 4, pp. 99–112.
- MOLLOY, J.C., CHADWICK, C., PLOYHART, R.E. AND GOLDEN, S.J. (2011), "Making Intangibles 'Tangible' in Tests of Resource-Based Theory: A Multidisciplinary Construct Validation Approach", *Journal of Management*, Vol. 37 No. 5, pp. 1496–1518.
- MOLODCHIK, M. AND JARDON, C.M. (2017), "Intellectual capital as enhancer of product novelty: An empirical study of Russian manufacturing SMEs", *Journal of Intellectual Capital*, Vol. 18 No. 2, available at: <http://doi.org/10.1108/JIC-06-2016-0059>.
- MOURITSEN, J. (2009), "Classification, measurement and the ontology of intellectual capital entities", *Journal of Human Resource Costing & Accounting*, Emerald Group Publishing Limited, Vol. 13 No. 2, pp. 154–162.
- NAZARI, J.A. AND HERREMANS, I.M. (2007), "Extended VAIC model: measuring intellectual capital components", edited by Bontis, N. *Journal of Intellectual Capital*, Emerald Group Publishing Limited, Vol. 8 No. 4, pp. 595–609.
- NONAKA, I. AND TAKEUCHI, H. (1995), *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York.
- OSIGWEH, C.A.B. (1989), "Concept Fallibility in Organizational Science", *Academy of Management Review*, Vol. 14 No. 4, pp. 579–594.
- PAGAN, A. (1987), "THREE ECONOMETRIC METHODOLOGIES: A CRITICAL APPRAISAL", *Journal of Economic Surveys*, Wiley/Blackwell (10.1111), Vol. 1 No. 1–2, pp. 3–23.

- PAOLONI, P. AND DUMAY, J. (2015), "The relational capital of micro-enterprises run by women: the startup phase", *VINE*, Emerald Group Publishing Limited, Vol. 45 No. 2, pp. 172–197.
- PENMAN, S.H. (2009), "Accounting for Intangible Assets: There is Also an Income Statement", *Abacus*, John Wiley & Sons, Ltd (10.1111), Vol. 45 No. 3, pp. 358–371.
- PETTY, R. AND GUTHRIE, J. (2000), "Intellectual capital literature review: Measurement, reporting and management", *Journal of Intellectual Capital*, Vol. 1 No. 2, pp. 155–176.
- PUFFER, S.M. AND MCCARTHY, D.J. (2001), "Navigating the hostile maze: A framework for Russian entrepreneurship", *The Academy of Management Executive*, Academy of Management, Vol. 15 No. 4, pp. 24–36.
- PUFFER, S.M. AND MCCARTHY, D.J. (2007), "Can Russia's state-managed, network capitalism be competitive?: Institutional pull versus institutional push", *Journal of World Business*, Vol. 42 No. 1, pp. 1–13.
- PUFFER, S.M., MCCARTHY, D.J. AND BOISOT, M. (2010), "Entrepreneurship in Russia and China: The Impact of Formal Institutional Voids", *Entrepreneurship Theory and Practice*, Vol. 34 No. 3, pp. 441–467.
- PUFFER, S.M., MCCARTHY, D.J. AND JAEGER, A.M. (2016), "Institution building and institutional voids", edited by Daniel Rottig, D. *International Journal of Emerging Markets*, Vol. 11 No. 1, pp. 18–41.
- PULIC, A. (2000), "VAICTM an accounting tool for IC management", *International Journal of Technology Management*, Vol. 20 No. 5/6/7/8, pp. 702–714.
- RIBEIRO SORIANO, D. AND CASTROGIOVANNI, G.J. (2010), "The impact of education, experience and inner circle advisors on SME performance: insights from a study of public development centers", *Small Business Economics*, Vol. 38 No. 3, pp. 333–349.
- RINGLE, C.M. AND SINKOVICS, R.R. (2009), "Advances in International Marketing", edited by Henseler, J., Ringle, C.M. and Sinkovics, R.R., Emerald Group Publishing, Bingley, Vol. 20 No. 2009, pp. 277–319.
- ROONEY, J. AND DUMAY, J. (2016), "Intellectual capital, calculability and qualcalulation", *British Accounting Review*, available at:<http://doi.org/10.1016/j.bar.2015.07.002>.
- ROOS, G., BAINBRIDGE, A. AND JACOBSEN, K. (2001), "Intellectual capital analysis as a strategic tool", *Strategy & Leadership*, MCB UP Ltd, Vol. 29 No. 4, pp. 21–26.
- ROOS, G., ROOS, J., DRAGONETTI, N.C. AND EDVINSSON, L. (1997), *Intellectual Capital: Navigating in the New Business Landscape*, New York University Press, New York.
- SALAZAR, E.A. AND SÁEZ, P.L. (2006), "Capital intelectual . Una propuesta para clasificarlo y medirlo Intellectual capital . A proposal to classify and measure it", *Academia, Revista Latinoamericana de Administración*, Vol. 37 No. 1, pp. 1–16.
- SÁNCHEZ, P., CHAMINADE, C. AND OLEA, M. (2000), "Management of intangibles – An attempt to build a theory", *Journal of Intellectual Capital*, MCB UP Ltd, Vol. 1 No. 4, pp. 312–327.
- SANTOS-RODRIGUES, H., FIGUEROA, P. AND JARDON, C.M. (2005), "The Relation Between Network of Collaboration (as a Relational Capital Dimension) and Firm Innovativeness", *Proceedings of the European Conference on Intellectual Capital*, Academic Conferences, Ltd., pp. 521–529.
- SELEIM, A., ASHOUR, A. AND BONTIS, N. (2004), "Intellectual capital in Egyptian software firms", *The Learning Organization*, Emerald Group Publishing Limited, Vol. 11 No. 4/5, pp. 332–346.
- SHEKSHNIA, S. (2008), "Founder-CEO succession: the Russian paradox", *European Journal of International Management*, *Inderscience Publishers*, available at:

<http://www.inderscienceonline.com/doi/abs/10.1504/EJIM.2008.016927> (accessed 27 February 2016).

SNODGRASS, D.R. AND BIGGS, T. (1996), *Industrialization and the Small Firm: Patterns and Policies*, International Center for Economic Growth: Harvard Institute for International Development.

STÄHLE, P., STÄHLE, S. AND AHO, S. (2011), "Value added intellectual coefficient (VAIC): A critical analysis", *Journal of Intellectual Capital*, Vol. 12 No. 4, pp. 531–551.

STEWART, T. (1997), *Intellectual Capital: The New Wealth of Organizations Intellectual Capital*, Doubleday Dell Publishing Group., New York, available at:<http://doi.org/10.1002/pfi.4140370713>.

SVEIBY, K.-E. (2010), "Methods for Measuring Intangible Assets", *Sveiby-Articles*.

SVEIBY, K.E. (1997), *The New Organizational Wealth: Managing & Measuring Knowledge-Based Assets*, Berrett-Koehler Publishers, San Francisco, CABerrett-Koehler Publishers, San Francisco, CA.

SYDLER, R., HAEFLIGER, S. AND PRUKSA, R. (2014), "Measuring intellectual capital with financial figures: Can we predict firm profitability?", *European Management Journal*, Vol. 32 No. 2, pp. 244–259.

TAWY, N. EL AND TOLLINGTON, T. (2012), "Intellectual capital: literature review", *International Journal of Learning and Intellectual Capital*, Vol. 9 No. 3, p. 241.

THUY, L.X., QUANG, T., LAI XUAN, T. AND TRUONG, Q. (2005), "Relational Capital and Performance of International Joint Ventures in Vietnam", *Asia Pacific Business Review*, Routledge, Vol. 11 No. 3, pp. 389–410.

TOVSTIGA, G. AND TULUGUROVA, E. (2009), "Intellectual capital practices: a four-region comparative study", *Journal of Intellectual Capital*, Vol. 10 No. 1, pp. 70–80.

USTINOVA, L. AND USTINOV, A. (2014), "Studying the impact of intellectual capital at industrial enterprises on their market capitalization", *Asian Social Science*, Vol. 10 No. 1, pp. 15–20.

VALIEVA, V. (2014), "Organizational routines in Russian companies: Review of practices", *Serbian Journal of Management*, University of Belgrade, Vol. 9 No. 2, pp. 241–262.

VOLKOV, D. AND GARANINA, T. (2010), "Intellectual capital structure: Case of Russian companies", *Proceedings of the European Conference on Knowledge Management*, ECKM, Vol. 2.

WANG, W.-Y. AND CHANG, C. (2005), "Intellectual capital and performance in causal models: Evidence from the information technology industry in Taiwan", *Journal of Intellectual Capital*, Vol. 6 No. 2, pp. 222–236.

WELBOURNE, T.M. AND PARDO-DEL-VAL, M. (2009), "Relational Capital: Strategic Advantage for Small and Medium-Size Enterprises (SMEs) Through Negotiation and Collaboration", *Business Management*, Springer Netherlands, L o s A n g e l e s, Vol. 18 No. 5, pp. 483–497.

WIIG, K.M. (1997), "Integrating intellectual capital and knowledge management", *Long Range Planning*, Pergamon, Vol. 30 No. 3, pp. 399–405.

WILLIAMS, C.C. AND ROUND, J. (2008), "Rethorizing the Nature of Informal Employment: Some Lessons from Ukraine", *International Sociology*, SAGE Publications, Vol. 23 No. 3, pp. 367–388.

WOODRUFF, D.M. (2004), "Property rights in context: Privatization's legacy for corporate legality in Poland and Russia", *Studies in Comparative International Development*, Vol. 38 No. 4, pp. 82–108.

Table 2: Description by sector

Sector	total assets		added value on assets		Personnel expenses on assets		intangible assets on assets		business expenses on assets		R & D expenditures on assets	
	Obs.	Half	Half	Desv. Tip.	Half	Desv. Tip.	Half	Desv. Tip.	Half	Desv. Tip.	Half	Desv. Tip.
Building	1,782	995	0.236	0.353	0.137	0.232	0.072	0.138	0.004	0.019	0.002	0.003
manufactures	5,490	2252	0.385	0.480	0.305	2,520	0.157	0.175	0.136	0.100	0.054	0.474
Energy and chemical	981	9014	0.202	0.379	0.093	0.240	0.290	1,783	0.050	0.103	0.003	0.014
Services	2,306	1501	0.455	1,202	0.309	0.327	0.285	0.380	0.034	0.095	0.041	0.079
Commerce	1,850	2702	0.399	0.294	0.261	0.197	0.142	0.162	0.037	0.043	0.005	0.028
Finance	2,375	523	0.163	1,420	0.114	0.464	0.120	1,524	0.030	0.377	0.003	0.031
Serv. professionals	4,658	451	0.606	3,917	0.421	0.437	0.314	0.779	0.098	3,177	0.077	0.905

THE ROLE OF THE LOMÉ, YAOUNDÉ AND COTONOU AGREEMENTS IN THE PROCESS OF TRADE LIBERALIZATION IN THE EUROPEAN UNION

JOSÉ MANUEL MUÑOZ PUIGCERVER

Universidad Nebrija
Calle Santa Cruz del Marcenado 27, 28015 Madrid

e-mail: jmmunozpuigcerver@gmail.com

Resumen

Las relaciones comerciales pueden convertirse en un poderoso instrumento para promover el desarrollo de las naciones como parte de un plan integral que combata la pobreza, ya que, a través de las exportaciones, los países pueden obtener las divisas que les permitan adquirir los bienes de capital y bienes intermedios que necesiten para su progreso. A su vez, si este tipo de bienes ingresan en el país libres de proteccionismo, el costo del desarrollo será menor. Bajo esta premisa se enmarcaron los Acuerdos de Yaoundé y sus versiones sucesivas durante la década de 1960, permitiendo a los países que se independizaban de su metrópolis seguir accediendo al mercado común europeo. Sin embargo, estos acuerdos no tuvieron el resultado deseado por parte de los países en desarrollo, demostrando una vez más la grave contradicción en torno a la cual se ha consolidado la política comercial de la Unión Europea, liberalizando sus mercados en el interior, pero ejerciendo una fuerte posición proteccionista frente al exterior. Así, la política comercial de la UE se utiliza como un sustituto de la política exterior teniendo en cuenta la debilidad (sino ausencia) de esta última.

Utilizando un método cualitativo, analizaremos los Acuerdos de Lomé y su posterior evolución hacia los Acuerdos de Cotonú como un buen ejemplo del uso de la política comercial como un instrumento de la política exterior (una de las ideas principales de esta investigación). Estos son, en resumen, acuerdos que representan un importante compromiso de la UE con la ayuda al desarrollo y los países más necesitados, a pesar de que consisten, principalmente, en un instrumento cuyos beneficios, incluso siendo considerables, reflejan tan sólo una pequeña parte de los que se podrían alcanzar a través de una reforma de la PAC que permitiera la liberalización de los productos agrícolas.

Palabras clave: Unión Europea, Convención de Yaoundé, Acuerdo de Cotonú, desarrollo económico, comercio.

Área Temática 1: Economía Internacional

Abstract

Trade relations can become a very powerful instrument for promoting the development of nations if they are used as part of a comprehensive plan to combat poverty, since, through exports, countries can obtain the foreign exchange that allow them to acquire those capital goods and intermediate goods that they need for their progress. In turn, if this type of goods enter the country free of the protectionist threat, the cost of development will be lower. Under this premise, the Yaoundé Agreements - and their successive versions - were framed during the 1960s, according to which those countries that were independent of their metropolis could continue to accede to the European common market. However, these agreements did not have the desired outcome on the part of the developing countries, thus demonstrating once again the serious contradiction around which the European Union's trade policy has been consolidated, liberalizing its markets in the interior but exerting a strong protectionist stance when considered necessary against the outside. In this way, the EU's real use of its trade policy is to be a substitute for foreign policy in the face of the weakness - if not absence - of the latter.

Using a qualitative method, we will analyze the Lomé Agreements and their subsequent evolution towards the Cotonou Agreements as a good example of the use of trade policy as an instrument of foreign policy, one of the strong ideas of this research. These are, in short, agreements that represent a major EU commitment to development aid and the countries most in need, even though it consists mainly of an instrument whose benefits - even if they are considerable - are only a small part of which would be achieved through a reform of the CAP that would allow the liberalization of agricultural products.

Keywords: European Union, Yaoundé Agreement, Cotonou Agreement, economic development, trade.

Thematic Area 1: International Economics

1. INTRODUCTION

The Lomé Agreements and their subsequent evolution towards the Cotonou Agreements are a good example of the use of trade policy as an instrument of foreign policy,¹ one of the strong ideas of this research. In the specific case of the ACP countries, it is a matter of using trade as an instrument of development aid policy - within the context of foreign policy - in order to develop a preferential framework with those countries whose cultural and historical links with certain countries as former colonies of European metropolises, make them eligible for commercial advantage. These are, in short, agreements that represent a major EU commitment to development aid and the most in need countries, even though it consists mainly of an instrument whose benefits - even if they are considerable - are only a small part of which would be achieved through a reform of the CAP that would allow the liberalization of agricultural products

Today, most development experts warn that trade liberalization is only one of the aspects that can promote economic growth and social welfare, the problem of poverty being a matter of so deep that it must be combated since different fronts.² However, it is no less true that at present few economists are ignorant of the precepts of the prevailing economic doctrine, according to which trade is a very powerful weapon in favor of the progress and development of nations. While trade liberalization does not in itself lead to the development of a society or its economic growth, it does increase opportunities for progress and these opportunities, in combination with other policies, can be exploited by developing countries. Thus, the countries of the South can take advantage, through the comparative advantage they have in the elaboration of certain products, of the potential that from the commercial exchanges is derived.³

It is within this framework of development cooperation through trade where the EU initiates assistance to the so-called ACP countries - Africa, the Caribbean and the Pacific - which began in 1963 with the first Yaoundé Convention and which would be followed by five more: Yaoundé II (1969), Lomé I (1975), Lomé II (1979), Lomé III (1984) and Lomé IV (1989). A revision of Lomé IV was carried out in 1995 and, finally, replacing all previous conventions, the so-called Cotonou Agreement was signed in Benin on 23 June 2000. This agreement, which lasts for 25 years - every 5 years - has as main objective its contribution to the eradication of poverty and was signed by a total of 77 countries.

2. METHODOLOGY

In this research, the qualitative methodology has been applied, which is the one of the political economics. It is a descriptive methodology in which, unlike the quantitative one, the new knowledge is not discovered, but is created through the explanatory intention of the phenomenology of the observable fact in itself. However, it goes beyond mere explanation, trying to reach an understanding of the economic phenomenon: using the inductive method, it does not try to measure the degree of given quality, but to understand and determine what qualities occur in that phenomenon. Also, being an inductive method, allows us to know how far we can induce.

The use of qualitative methodology in applied economics research fulfills at least a double function: on the one hand, the mere fact of using a method more typical of other scientific disciplines allows us to carry out a kind of "scientific benchmarking", leading to novel results that we would not get with other methods. On the other hand, being the qualitative method of a holistic nature, it establishes results that go beyond the economic sphere itself and allows to relate the economic phenomenon to other areas of the social sciences such as sociology, political science or even philosophy and history. It is true that, precisely because of its own holistic character, the more knowledge it relates to, the less generalizable are its results - a consequence of its particularism-. Even so, it should not be forgotten that the different disciplines that make up scientific knowledge are divided into different branches to facilitate their systematization and subsequent analysis, which should not lead us to the mistake of considering them watertight compartments: being aware of their interrelation, the application of the qualitative method also contributes to finding points of union between the branches of the social sciences.

Throughout history, the method used in economic science has clearly evolved until qualitative investigations. This fact has not been arbitrary, since the quantification of the magnitudes allows the maximum objectivity when analyzing them. Therefore, there has been a tendency towards the measurement of variables and the attempt to convert those quantities that are not measurable into measurable ones. In the latter case, the

¹Ortega y Gasset (2011) affirms that if any political power wants to consolidate its position in the world it has to consist with a strong foreign policy. In fact, it comes to affirm that Spain was only a true world power when it carried out the conquest of the Americas, since in that way it demonstrated its power in external matter. Statisticians consider that trade policy is an important foreign policy instrument that the major world powers should not scorn. They also consider that trade must be conceived as a weapon of power, putting a supposed "national interest" on the well-being of citizens and justifying the losses that protectionism causes them.

²Bhagwati (1965), considers that internal issues such as the scarcity of savings and the consequent lack of investment that it entails, the excess of population or poor education and the decline in both skilled and unskilled labor, are at least as important and necessary to address as international considerations, including trade considerations.

³ Some studies indicate that relative advantage is a necessary but not sufficient condition for developing countries to export to developed countries, as firms in the first group of countries are also required to adapt their businesses to the markets they want to export (Artopoulos and others, 2014).

understanding of phenomenology by applying the qualitative method, also contributes to that conversion in a more precise way.

The use of the inductive method on which the qualitative approach is based can also save time and labor by arriving at conclusions, in certain respects, in which the quantitative approach is not necessary. As we have already pointed out, in attempting to explain, not the magnitude of the economic phenomenon, but its nature, we seek the dynamic structure of the observable event itself, as opposed to its static structure, thus allowing valuable results to understanding human phenomena. This discursive method does not necessarily generate scientific laws, but it does create a greater knowledge and understanding of the phenomenology of the economic fact itself, going beyond its mere explanation.

So, the qualitative method in applied economics complements the quantitative approach and its general vision, allowing us to ascertain "how far" it is necessary to generalize, that is to say, to what extent the results of the quantitative study are extrapolable. Justifying all the assertions made in the relevant economic literature and using statistical data from official sources, this research becomes relevant in trying to better understand the role played by trade liberalization in the formation of the European Union.

3. THE RELATIONSHIP BETWEEN TRADE AND DEVELOPMENT

Before beginning to look in more detail at the agreements that the EU establishes with the ACP countries, a little more detail should be given to the previous discussion on the contribution of trade to economic development for developing countries. And, as we have said before, although trade cannot act as the only remedy to overcome the phases of underdevelopment, it can act as a catalyst to accelerate the process and contribute to it. There is currently a very broad international consensus on trade and development, so that even the United Nations has UNCTAD - the United Nations Conference on Trade and Development - as a specialized body to promote trade relations for the development of developing countries.

International economic expert Bhagwati (1965) already stated that:

"Trade provides (...) the possibility of overcoming the obstacles imposed by natural resources, thus relating development more closely to population and capital accumulation, both of which provide a permanent potential for economic expansion".

With this statement, Bhagwati confirms the above: the real key factor for progress and economic growth is capital, both human and physical, and, therefore, the differences in the accumulation of capital will make the difference between the development and underdevelopment of a nation. In the case of human capital, it is essential that a society that aspires to be prosperous and reach important levels of progress has a healthy workforce - a fundamental issue in the poorest countries - and well-formed so that it is more productive in this way. In addition, it is also crucial that countries are open to immigration to capture all those human resources and talent that will enable them to cover potential national deficiencies in that regard. Similarly, with regard to physical capital, it is essential that a nation that aspires to development has all the productive and technological infrastructure necessary to create wealth and jobs. However, if we are talking about poor countries that have few national resources, it is more than likely that these essential equipment and technology to increase their production have to be imported from the outside. In turn, they will need foreign exchange to be able to pay for those imports that are so necessary for their progress, from their own exports. This is where trade plays a crucial role in development, acting as an instrument to obtain such indispensable capital. Therefore, trade, like any instrument, will only be effective if used correctly, in which case it will be a very powerful tool for the welfare of societies.

In this regard, it is important to note that the European Union usually provides trade-related technical assistance to developing countries to which it gives trade benefits, precisely to complement this trade-based development aid policy. In fact, in order for developing countries to take advantage of the benefits that trade can bring to them, it is imperative that they be integrated into the globalization process, since those nations with lower incomes are traditionally those that participate least in world trade, despite having experienced improvements in their situation in recent decades, as we can see in Figure 1.

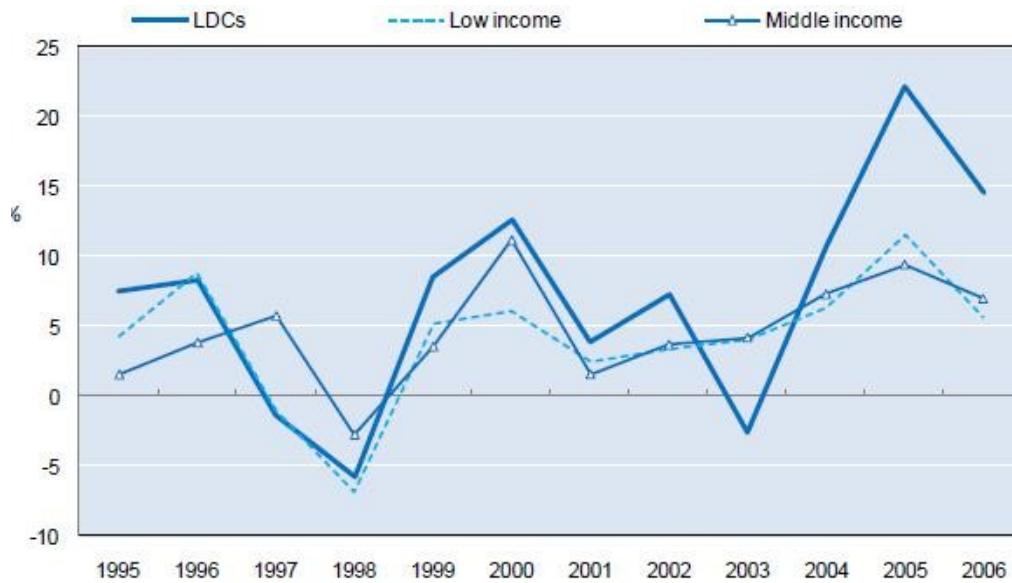


Figure 1. Relative growth of world exports of goods and services (being 0 the world average)
Source: Hayashikawa (2009).

In fact, in Figure 2, we can see how, precisely, since the mid-1990s, developing countries have experienced a significant increase in their commercial activity in relation to their GDP growth.

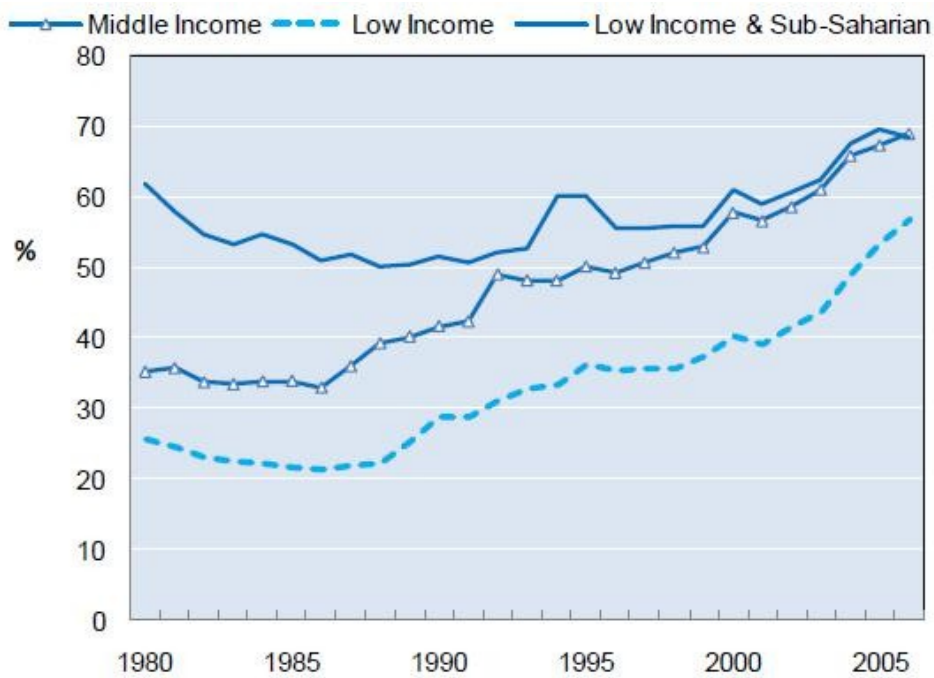


Figure 2. Trade relations as a percentage of GDP.
Source: Hayashikawa (2009).

We find a clear example that for developing countries exporting is as important as importing in India.⁴ Between 1991 and 1997, India lowered its tariffs from an average of 90 percent to one of 30 percent, causing imports to double in the same period of time. Even the production of manufactured goods increased by 50 percent during those years, contrary to what a priori seemed to have occurred. These imports had a major impact on the country's GDP growth during the 1990s, since a significant proportion of the imported goods were intermediate goods or capital goods that India needed to develop and that get much lower prices than it did before. In fact, imports of consumer products increased by 90 per cent, while imports of intermediate products grew by 227 per cent between 1987 and 2000.⁵

We have just justified the imperative need to import capital for the developing countries to achieve their desired progress and the obligation to export to obtain the foreign exchange necessary for the purchase of those imports. However, this commercial duality is by no means symmetrical, which contributes, according to some analysts, to the causes of its poverty.⁶ Thus, the developing countries have a number of characteristics that greatly condition their trade structure, both in terms of exports and imports.

First, the concentration of exports, both geographically and productively, is a symptom of scarce economic development.⁷ Many developing countries have specialized in the production of a single good, making them especially vulnerable to sudden price fluctuations. In addition, we can also consider that the deterioration in the real exchange ratio between the products exported by the developing countries - essentially agricultural - and the goods exported by the developed nations - industrial products with a high added value - is another reason that contributes to underdevelopment. According to this deterioration in the real exchange ratio, the price of industrial goods that the developing countries need to import to develop increases more than the agricultural products that they need to export to acquire the aforementioned imports. In this way, the income obtained by export covers an increasingly smaller amount of the disbursement made by the imports they need.

This type of conditioning for the most backward economies poses a challenge to traditional development theories. They assumed that the development of the countries is marked by a series of stages in which, gradually, societies are progressing from an initial stage, in which the weight of the economy corresponds to the agricultural sector, to an intermediate stage, when the Industrial Revolution takes place - a period in which the famous *take off* takes place, a term by Walter Whitman Rostow (1916 - 2003) to refer to the phase of greater economic growth of a society - and lead to a final phase, in which a country already consolidates its development and the service sector becomes the engine of the economy. For a certain group of economists, including the Nobel Prize in 1994 Douglas C. North (awarded for his research on economic history, applying theory to historical facts), observed the existence of developed countries that had not fulfilled the order of the stages described above and which simply presented a series of conditions that led them to specialize in the production of certain types of goods, whether agricultural or industrial. The investigations of Douglas North, among others - in fact there are studies in that sense previous to those of North, like those of M.C. Daly and those of Homer Hoyt in the 1940s, while North's work dating back to the 1950s gave rise to the so-called export-base theory that if a market is too small for a particular industry and it can not grow because of its insufficient demand, exports can be the solution for their growth and their subsequent contribution to national development. It is true that this theory has received much criticism due to its approach of development from an almost Keynesian point of view, focusing on the growth derived from the demand. But there is a fairly broad consensus that both Douglas North and his predecessors were able to identify certain aspects of that theory that are now considered almost indisputable in the relationship between trade and development. One of these aspects, for example, is the importance given to the optimum size of the market, since if a domestic market is too small for an industry to prosper, increasing the size of the foreign market will allow the industry to experience a level of specialization and a better use of economies of scale. In addition, it was also able to foresee the risks of excessive specialization, as is the case in many developing countries, where practically all of their production consists of monocultures that

⁴ The increase in manufacturing capacity may be due to several factors. One of them is that the costs of imported raw materials are lower, so that, without the need to invest in capital goods, production can be increased by obtaining more inputs with the same previous cost. New products can also be manufactured, thus expanding the range and diversity of manufactured goods. In fact, 66 percent of the growth that imports experienced during those years was of products that India had hitherto simply not mattered because it was too expensive - an example is film, since until the 1970s India produced films in black and white as a result of the difficulty of importing the material needed to make color films. The acquisition of these new inputs caused the production of intermediate goods to be cheaper and the price of these products fell by 4.7 percent a year from 1989 onwards. The variety of products manufactured by the manufacturing companies also increased, passing the average of 1.4 products per company before liberalization to be 2.3 in the year 2003. Those companies where the tariff reduction went deeper produced a greater variety of goods and invested more in research and development. In total, the new products accounted for 25 per cent of India's increase in manufacturing output between 1991 and 1997. When there were different levels of development in the country, obsolete products continued to be manufactured, but were purchased by consumers with lower purchasing power. This Indian trade pattern is applicable to other countries like Indonesia or Colombia. Vid. Goldberg and others (2009).

⁵ Goldberg and others (2009).

⁶ It must be remembered that the causes of underdevelopment are manifold and that many of them go beyond the realm of economic science and reach areas such as politics. This is the case of corruption, which is widespread in this kind of countries.

⁷ This interpretation is due to A. O. Hirschman, in the case of geographical concentration, and to M. Michaely, in the case of product (Serrano, 1997).

excessively condition the country's income to the fluctuations that the market establishes in the price of that concrete product. Productive specialization should not be at odds with at least minimal diversification of risk. Finally, despite the fact that the theory of the export base does not in itself consider the importance of imports to the developing countries by not treating exports as a necessary instrument in order to acquire the resources with which to obtain those imports - exports would therefore be an end in itself and not an instrument to achieve a later goal, according to this theory - it does identify the way in which exports can contribute to the development of a nation. In fact, although, as we have said before, it is not necessary for countries to comply with the stages established by the traditional development theory, it is also true that in some cases policies aimed at strengthening exports of agricultural products in those countries. In this way, such exports could generate the revenues necessary to produce the so-called "drag effect" since the more productive and prosperous the primary sector, the more likely there will be a demand for industries and services related to this sector. Thus, development would be only a matter of time.

The analysis of how exports contribute to the development of the nations most in need is the starting point for addressing the agreements that the EU establishes with these countries as part of its development cooperation policy. If we agree that access to international markets is an absolutely necessary source of income for their progress, the best way to be able to contribute to the development of developing countries is to freely access international markets by exporting those products in which they have an relative advantage over the rest. It is within this framework of development cooperation through trade - and especially through the exports with which to obtain income to be able to acquire the imports necessary for its progress -, where the EU agreements are framed with the so-called ACP countries.

4. THE RESULTS OF THE YAOUNDÉ, LOMÉ AND COTONOU AGREEMENTS

The antecedents of the Lomé and Cotonou Conventions were the Yaoundé and Arusha Conventions. Indeed, these were the first commitments that the newly created European Economic Community adopted in terms of assistance to the countries most in need through trade. The Yaoundé Convention took place on 20 July 1963 in Cameroon, as a consequence of the independence process that began in that decade to experience the colonies belonging to the member countries of the EEC.⁸ When the Treaties of Rome were signed, these colonies were considered territories of the EEC because each one belonged to their respective metropolis. But as these countries acceded to independence, their territories ceased to be part of the EEC space; the way to maintain commercial ties with them was through free trade agreements. These colonies, all of them belonging to the African continent, were in total 18: Benin, Burkina Faso – formerly Alto Volta-Burundi, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of Congo (formerly Zaire), Côte d'Ivoire, Gabon, Madagascar, Mali, Mauritania, Niger, Rwanda, Senegal, Somalia and Togo. Subsequently, in July 1969, the Yaoundé Agreement was revised: the treaty of 1963 was called Yaoundé I and the one adopted in that year Yaoundé II. However, there were hardly any substantial changes between Yaoundé I and Yaoundé II commitments. In addition, in September of the same year of 1969 - although it did not enter into force until 1 January 1971-, the Arusha Treaty was signed, which also incorporated Kenya, Tanzania and Uganda to the Yaoundé Convention.

As we have just pointed out, the Yaoundé Convention agreed that the member countries of the EEC should maintain commercial ties with their already disappeared colonies. It was therefore to be hoped that the territories which had belonged to the new colonial powers which would end up joining the European Communities would be added to that agreement. This was what happened in the 1970s with the incorporation of the United Kingdom to the EEC in 1973.

The Lomé Convention passed to the old Yaoundé Convention. It was signed on February 28, 1975 and the geographical area was expanded for the first time and that, in addition to the African countries, the Agreement also reached the countries of the Caribbean and the Pacific. Specifically -in addition to the signatory nations of Yaoundé I and Yaoundé II- they joined the agreement Botswana, Ethiopia, Gambia, Ghana, Guinea-Bissau, Kenya, Lesotho, Liberia, Malawi, Mauritius, Nigeria, Guinea, Sierra Leone, Sudan, Swaziland, Tanzania, Uganda and Zambia by Africa; Bahamas, Barbados, Grenada, Guyana, Jamaica and Trinidad and Tobago by the Caribbean; Fiji, Samoa and Tonga by the Pacific.

In addition, three other Lomé Conventions, called Lomé II, Lomé III and Lomé IV, would take place in later years. The Lomé II Convention was signed on 31 October 1979 and the countries that joined the agreement were Cape Verde, Comoros, Djibouti, Sao Tome and Principe and Seychelles by Africa; Dominica, Saint Lucia and Suriname by the Caribbean; Kiribati, Solomon Islands, Papua New Guinea and Tuvalu by the Pacific. The Lomé III Convention was signed on 8 December 1984 - entering into force on 1 May 1986 - and the ACP countries which joined were Zimbabwe from Africa; Antigua and Barbuda, Barbados, Belize, Saint Kitts and Nevis and Saint Vincent and the Grenadines by the Caribbean; Vanuatu did it for the Pacific. For its part, the Lomé IV Convention was signed on 15 December 1989 - entering into force in 1991 - and with it a new African country, Namibia, was incorporated. Finally, a revision of the Lomé IV Convention came into force in 1995, from which two new African countries were added: Eritrea and South Africa.

⁸ Vid. Witker (1984) on the Yaoundé and Lomé Conventions.

The bulk of the Yaoundé and Lomé agreements consisted of a non-reciprocal preferential trading system, ie a system in which the EU granted tariff and quota advantages to imports from ACP countries without this group of countries should be obliged to do the same with imports from the EU. In addition, this system of trade preferences was supplemented by a European Development Fund to finance the technical assistance or trade infrastructures that those countries needed to integrate into the international economy. However, the result of trade preferences granted by the EU to the ACP countries in the years following the Lomé Agreement was bleak: in 1976 ACP countries accounted for only 6.7% of total Community trade. In 1998, that percentage dropped to 6 per cent, and in addition, 60 per cent of total exports were concentrated on only six products.⁹ In the years prior to 1998, the percentage was even lower, with the exception of 7.2 per cent in 1980 and 6.7 per cent which was repeated in 1985, EU trade with the ACP countries only 4.7 per cent of the total in 1990, 3.7 per cent in 1992 and 2.8 per cent in 1994.¹⁰

Llorca and Cuenca (2005), provide further information on the little success obtained by these agreements. According to these authors, EU imports from non-EU countries increased by 548.42 percent between 1976 and 2001, while imports from ACP countries increased by 210.53 percent for the same period. Their average annual variation, also for the period 1976-2001, was 4.6 percent, compared with the 7.76 percent average annual increase experienced by all imports from non-EU countries. This average annual increase was even lower as the Lomé Conventions were renewed, since from the 13.85 per cent average annual change in Lomé I it was changed to 10.94 per cent of Lomé II and to a -4.58 percent in Lomé III. From Cotonou, however, the positive trend was consolidated with a 19.81 percent average annual growth. According to Llorca and Cuenca (2005), the percentages of Community imports from ACP countries of total EU imports were 6.34 percent in 1976, 7.00 percent in 1980, 6.55 percent in 1985, 4.74 per cent in 1990, 3.65 per cent in 1995, 2.76 per cent in 2000 and 3.03 per cent in 2001. Geographically, these same authors point out that the concentration of European imports from ACP countries also increased, although it somewhat relaxed by area: in 1976, Africa accounted for 94.39 per cent of total imports from the ACP countries - Kenya alone accounted for 32, 28 percent of the total as a result of oil sales, Ivory Coast 10.06 percent, Democratic Republic of Congo 8.64 percent and Zambia 4.04 percent. In 2001, however, that percentage dropped to 88.50 percent. As regards the Caribbean, its exports to the EU from the total of that group of countries were 5.14% in 1976 and increased to 10.17% in 2001. The percentage for the Pacific area was of 0.47 percent and 1.70 percent for 1976 and 2001 respectively. Concentration by products was also excessive, with the focus on agricultural and other primary goods, although the trend of that concentration was declining: fossil fuels, which accounted for 33.65 per cent of Community imports from ACP countries in 1976, in 2001 they were 29.91 percent. Copper and derived products significantly decreased their share of total imports, from 8.74 percent in 1976 to 0.24 percent in 2001. Also products such as coffee, mate and different spices reduced their participation from 11.72 to 2.88 percent in those same years. Cocoa and preparations also declined from 7.16 to 5.46 percent while other non-metallic minerals did the same from 6.73 to 2.15 percent. Industrial products increased their share of total imports: machinery and vehicles rose from 0.42 percent in 1976 to 9.07 percent in 2001, while other industrial products rose from 0.91 percent to 11.92 also in those same years.

The reasons for the low incidence - if not failure - of these agreements in the development of the ACP countries are several. Firstly, it is true that both the Yaoundé and Lomé Conventions allowed the entry of certain products from those nations into tariffs lower than those applied by the EU, with this tariff being even zero for some products. However, certain agricultural goods of vital importance to the economies of these nations - as we mentioned earlier, some countries were almost exclusively dedicated to the cultivation of a single good - were excluded from these preferences as a result of the high level of protectionism of the Common Agricultural Policy - much more protectionist in the 1970s than it is today -. It was far from accidental that tropical products not produced in Europe such as coffee, cocoa, pineapple, coconut, nutmeg or vanilla¹¹ were chosen to enter freely on the European market - since they were not affected by the CAP - while others such as sugar or bananas - still enjoying important privileges, such as the fact that sugar producers in ACP countries charge the same price as Community producers, which has led to serious complaints within the WTO by other sugar-exporting countries not adhering to the agreement and which, on the other hand, do have the capacity to compete effectively with the EU in the sale of such products - would not enjoy such free access like other goods.

In addition, there was also an "erosion effect" resulting from the GATT's Kennedy, Tokyo and Uruguay Rounds between the 1960s and 1990s, as a result of the multilateral negotiations that took place and of the

⁹ Sota and Suárez (2001).

¹⁰ Grynberg (1998).

¹¹ In addition, the then six members of the EEC agreed with the 18 ACP countries signatories of the Yaoundé Convention the reduction of the common external tariff for products from other countries that are not signatories of the agreement. For example, for the same products mentioned, the common external tariff was reduced from 16 to 9.6 percent for coffee, from 9 to 5.4 percent for cocoa, from 12 to 9 percent for pineapple, from 5 to 4 percent for coconut, from 20 to 15 percent for nutmeg and from 15 to 11.5 percent for vanilla. Since these products could be duty-free on the European market for the signatory countries of the Lomé Agreement, this was a clear case of discrimination, which was contrary to GATT and WTO rules. Therefore, the EU had to request permission from these organizations in order to continue applying the agreement. Vid. European Community Information Service (1966).

preferences granted by the EU that were extensible by the most-favored-nation clause to all countries, the benefits accruing from the Yaoundé and Lomé Agreements were less and less. As a result, the European market share for ACP products, despite their position as an initial advantage, has fallen in favor of other, more efficient and non-ACP producers - such as Latin American nations or the Asian ones.

The rules of origin also entailed a significant constraint on the favorable access to European markets for tropical products from ACP countries because, according to the Lomé I Convention, for a product to be considered as belonging to an ACP country, in that country must be produced at least 50 per cent of the value added of that product. This requirement, in view of the industrial and economic structure of these nations, was very difficult to meet, although to compensate for this restriction all ACP countries were considered as a single customs union, so that only 50% of the added value was produced in several countries belonging to that group, in what came to be called the "accumulation rule". Lomé II, Lomé III and Lomé IV made little change with respect to Lomé I: only a certain degree of laxity was agreed with respect to the rules of origin and an attempt was made to incorporate the services sector into trade agreements as well.¹² In addition, all the bureaucracy required for countries to benefit from these preferences derived from rules of origin, among other requirements, did not benefit too much from countries taking advantage of European concessions.

It was clear that this system of preferential advantages established with the ACP countries needed urgent reform. It is true that, as we have already pointed out on a number of occasions, the EU uses its trade policy as an instrument of foreign policy and, from that point of view, the Yaoundé and Lomé Agreements could be considered to have a much more political objective than an economic one. We cannot ignore or overlook the importance of partnership and development co-operation for the EU with its extinct colonies and the significant trade benefits that could accrue from the agreements. It is therefore obvious that the failure of the agreements for the ACP countries also represented a failure for the EU itself, since such disastrous economic results could jeopardize the political ties of those nations with the European institutions. The Cotonou Agreement was signed on 23 June 2000 with the aim of modifying and achieving commercial and economic results.

In summary, the ACP countries which signed the Cotonou Agreements were, by geographical area, the following:

Table 1. ACP countries by geographical area.

- Africa: Benin, Burkina Faso, Burundi, Cameroon, Ivory Coast, Chad, Gabon, Madagascar, Mali, Mauritania, Niger, Central African Republic, Congo, Rwanda, Senegal, Somalia, Togo - all signatories of The Conventions of Yaoundé I and Yaoundé II, - Botswana, Ethiopia, Gambia, Ghana, Guinea-Bissau, Kenya, Lesotho, Liberia, Malawi, Mauritius, Nigeria, Guinea, Sierra Leone, Sudan, Swaziland, Tanzania, Uganda, Zambia - from Lomé I -, Cape Verde, Comoros, Djibouti, Sao Tome and Principe, Seychelles - from Lomé II -, Zimbabwe - from Lomé III -, Namibia - from Lomé IV -, Eritrea and South Africa - These last two, from Lomé IV revised.
- Caribbean: Bahamas, Barbados, Grenada, Guyana, Jamaica, Trinidad and Tobago - from Lomé I -, Dominica, Saint Lucia, Suriname - from Lomé II - Antigua and Barbuda, Belize, Saint Kitts and Nevis and Saint Lucia and Saint Vincent and the Grenadines - the latter since Lomé III-
- Pacific: Fiji, Samoa, Tonga - from Lomé I - Kiribati, Solomon Islands, Papua New Guinea, Tuvalu - from Lomé II - and Vanuatu - the latter from Lomé III.

Source: Own elaboration based on information from Dodo (2008).

5. THE FINANCING OF THE YAOUNDÉ, LOMÉ AND COTONOU AGREEMENTS

The Cotonou Agreement consists of two distinct strands: a purely commercial aspect, based on a series of preferential advantages for the signatory countries and a commitment to development assistance financially supported through the European Development Fund (EDF). Thanks to the EDF, ACP countries can have up to EUR 13.5 billion over a 5-year period, a further EUR 9.9 billion from previous EDFs and, in addition, from EIB contributions, of up to 1,700 million euros.¹³

¹² Llorca and Cuenca (2005).

¹³ Club de Exportadores e Inversores (2004).

Until the signing of the Cotonou Agreement in 2000, EDF assistance was divided into two categories: programmable aid and non-programmable aid. The latter, as its name suggests, is the aid offered to these countries depending on the circumstances and, in turn, divided into two different mechanisms:

Table 2. Mechanisms of non-programmable EDF assistance.

- STABEX: A mechanism that compensates for sudden declines in revenues from the sale of basic agricultural or fishery products or decreases in exports. In total, it covers up to 50 different products, although in practice the resources of this mechanism are largely centered on coffee, cocoa, cotton, tea, peanuts and bananas.
- SYSMIN: An analogous mechanism to STABEX, with the difference that it is intended for mining products rather than for agricultural products.

Source: Own elaboration based on information from Sota and Suárez (2001).

For its part, programmable aid also has two mechanisms:

Table 3. Mechanisms of EDF programable assistance.

- National Indicative Programs (NIP): destined to the main areas of action for the development of the country.
- Regional Indicative Programs: they cover areas where the NIP does not focus, for example those actions aimed at promoting economic integration.

Source: Own elaboration based on information from Sota and Suárez (2001).

With the signing of the Cotonou Treatment, the SYSMIN and STBAEX instruments were abolished, but the European Development Funds were maintained. The amounts allocated to the EDF at the various stages were as follows:

Table 4. Amounts allocated to the EDF.

- First EDF (1958-1963): 581 million euros.
- Second EDF (1964-1970): Yaoundé I. 666 million euros.
- Third EDF (1971-1975): Yaoundé II. 843 million euros.
- Fourth EDF (1976-1980): Lomé I. 3,072 million euros.
- Fifth EDF (1981-1985): Lomé II. EUR 7,400 million euros.
- Sixth EDF (1986-1990): Lomé III. 8,500 million euros.
- Seventh EDF (1991-1995): Lomé IV. 10,800 million euros.
- Eighth EDF (1996-2000): Review of Lomé IV. 12,967 million euros.
- Ninth EDF (2001-2005): Cotonou Agreement. EUR 13,500 million euros.
- Tenth EDF (2008-2013): Cotonou Agreement. EUR 22,682 million euros.

Source: Own elaboration based on information from Dodo (2008).

The Cotonou Agreement establishes the need to adopt trade commitments that are in line with WTO rules and that facilitate the integration of ACP economies into the global trading system. To this end, it was set as a deadline on 31 December 2007, although on that day not all negotiations with the various countries had come to fruition.

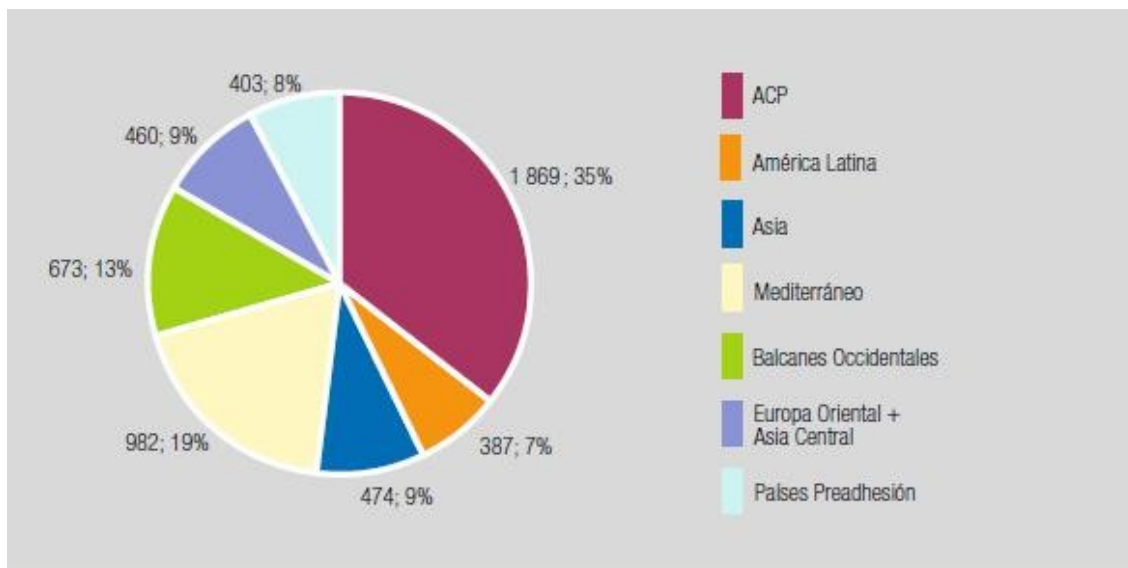


Figure 3. Trade-related aid by region for the period 2001-2006.

Source: European Union (2008)

In spite of all the above, the ACP countries are the group of developing countries that receive the most aid from the European Union, as we can see in Figure 3 - specifically, they received 35% of the total aid linked to trade for the period 2001-2006 -.

6. TRADE RELATIONS BETWEEN THE EU AND ACP COUNTRIES

In total, the group of ACP countries represents a market of 1,350 million inhabitants and, in 2007, trade flows between the EU and these nations were 80,000 million euros, with 40,200 million EU imports from these countries and 39,700 million for exports from the EU to the ACP countries.

One of the principles on which the Cotonou Agreement is based (apart from compatibility with WTO rules, reciprocity, and differentiated treatment according to the different level of development of countries) is that of regionalism, that is, The European Union prefers to reach agreements with groups of countries rather than with individual countries.¹⁴ As a result of the Cotonou Agreement negotiations, the EU's trade relations with the ACP countries have been grouped as follows:

¹⁴ Bonet (2007).

Table 5. EU trade relations with the ACP countries by economic regions.

- West Africa. The countries that comprise this region are Benin, Burkina Faso, Cape Verde, Ivory Coast, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo and Mauritania. This is the ACP region where there is the largest trade flow with the EU. In fact, this region represents 40% of all the trade that the EU establishes with the countries of Africa, Caribbean and Pacific. EU imports from West Africa are heavily concentrated in three countries: Ivory Coast, Ghana and Nigeria. These three countries represents up to 80% of all European imports from the region. The main countries of the area to which the EU exports are Ivory Coast and Ghana, these exports consisting mainly of industrial products such as machinery, vehicles, transport equipment and chemicals. By contrast, the products that this region exports to the EU consist of a fairly small range of agricultural goods, such as mango, pineapple, peanuts or cotton, and raw materials such as copper, gold and diamonds. The EU is also importing oil, mainly from Nigeria, but also from Ghana. In addition, European imports of cocoa from Ghana are also important, as this country, along with Ivory Coast, is the world's largest cocoa exporter. Also, both Ghana and Ivory Coast, as well as Cape Verde and Senegal, are important suppliers of bananas and fishery goods. Ivory Coast has undertaken to allow free access to its markets of 80.8% of the value of imports from the EU. Although negotiations continue to establish an Association Agreement with the whole region, The EU does not intend to accept the proposal made by the countries of West Africa, consisting of the elimination of 70% of tariffs on European imports - the offer made in 2013 was 74.19% - in a term 25 years old; in discussions with other ACP regions, it is usually negotiated around 80% liberalization over 15 years. Even so, an intermediate position may be accepted, as the EU might be willing to accept the offer made in January 2014, which would entail a 75% liberalization of the value of imports over a period of 20 years.
- Central Africa. The countries that compose this region are Cameroon, Central African Republic, Chad, Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon and Sao Tome and Principe. By far, the region's main exports to the EU are oil, accounting for 70% of its total exports to the EU. In fact, the Central African Republic is the only country in the area that does not export oil to the EU. Other important European imports from Central Africa are cocoa, bananas, copper, wood and diamonds. For its part, the EU exports to this region consist of machinery, vehicles, pharmaceutical goods and foodstuffs. In Central Africa, an agreement has been reached with Cameroon involving the liberalization of 80% of the country's imports from the EU within 15 years. In addition, negotiations are still under way to allow other countries in the area to join this agreement, seeking to establish a comprehensive regional agreement.
- East African Community. The countries that make up this region are Kenya, Uganda, Tanzania, Burundi and Rwanda. The main European imports from this region consist of flowers, fish, vegetables, coffee, tea and tobacco. In contrast, EU exports to the area are basically machinery, vehicles and pharmaceuticals. The Eastern African Community has undertaken to liberalize its markets for Community products by 82% of exports, making 80% within 15 years and 2% within 25 years. However, under the argument of protecting nascent industry, certain goods such as agricultural products, wines, liquors, plastics, paper, textiles and clothing, footwear, glass products or chemicals have been left out of the agreement.
- Common Market for Eastern and Southern Africa. The countries that comprise this region are Comoros, Djibouti, Eritrea, Ethiopia, Madagascar, Malawi, Mauritius, Seychelles, Sudan, Zambia and Zimbabwe. This region mainly exports tobacco, fish, copper, sugar, coffee and crude oil to the EU. For its part, the EU exports to this area are machinery, vehicles and pharmaceuticals. Individual liberalization agreements have reached 97.5% of the value of Community imports in the case of Seychelles, 80% for Zimbabwe, 95.6% for Mauritius and 80% for cases of Comoros and Madagascar.
- Southern African Development Community. The countries that comprise this region are Angola, Botswana, Lesotho, Mozambique, Namibia, South Africa and Swaziland. The EU is its main trading partner, both importer and exporter. The main exports to the EU are diamonds from South Africa, Lesotho, Botswana and Namibia, meat from Botswana, fish from Namibia, sugar from Swaziland, oil from Angola or aluminum from Mozambique. South African exports are more varied, as they consist of both industrial products and raw materials and agricultural goods such as platinum, wine or various fruits. Meanwhile, the EU exports machinery, electrical equipment, vehicles, pharmaceuticals and processed foods to the region. Botswana, Lesotho, Namibia and Swaziland have agreed to open their markets to 86% of Community imports and Mozambique has done the same for 80.5%.

- Caribbean. The countries that comprise this region are Antigua and Barbuda, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Lucia, Saint Vincent and the Grenadines, Saint Kitts and Nevis, Suriname and Trinidad and Tobago. In the international negotiations, these countries usually present themselves jointly through the so-called Caricom. With the EU, they have committed to eliminate 61% of European imports in 10 years, 83% in 15 years and 87% in 25 years. Trade flows between the EU and the Caribbean region totaled 8 billion euros in 2011, with the EU being the second largest trading partner behind the United States. The main Caribbean exports to the EU are fuels, minerals such as gold, aluminum and iron oxide and hydroxide, fertilizers and agricultural products such as bananas and sugar - in addition to rum. In contrast, EU exports to the Caribbean consist essentially of boats, cars and other vehicles, telephone equipment, milk and alcoholic beverages.
- Pacific. The countries that compose this region are the Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. The only country in the region with which a full Association Agreement exists is with Papua New Guinea, which includes new rules of origin for fish exports that, for the moment, only affect this country. In addition, both Papua New Guinea and Fiji have committed to liberalize 88% of their European imports - although products such as meat, vegetables or fish have been excluded. The Pacific region exports products such as coconut, fish, caviar, palm oil and coffee to the EU. On the other hand, the EU exports electrical machinery and equipment to this region.

Source: Own elaboration based on the information from <http://ec.europa.eu/trade/creating-opportunities/bilateral-relations/> and Figuerola (2013).

In short, from the analysis of the previous tables we can conclude that there is a long way to go for the EU to contribute effectively to the development of the less favored nations through trade. It is true that steps have been taken in the right direction, but we must not forget the political intentions behind it. As we said earlier, it is not by chance that tropical goods which are not produced in Europe are completely liberalized and that aid is granted - albeit not fully liberalized - to imports of agricultural goods which, although they may be produced in the EU, do not imply direct competition for European producers. Trade is a very powerful instrument for development but it should not be used as a disguise under which to hide protectionist ends and interests of certain lobbies since, definitively, the EU allows free market access to those products that do not matter. The best way to help the developing countries from a commercial point of view is to let them export everything they can sell.

7. CONCLUSIONS

The failure of the ACP countries - as well as the European Union itself - to sign the Yaoundé and Lomé Agreements demonstrates the contradiction that the European Union has been experiencing practically since its inception, when in international organizations acts as a strong advocate of free trade in applying its principles in the internal market but without presenting the slightest compromise against third parties, although these developing countries are dependent on the foreign exchange earned of its exports to acquire the imports necessary for its progress. Thus, from a theoretical point of view, trade is a source of economic progress and development - and therefore, can lead to social development - that no country should afford to ignore.

In spite of this, there is also a certain consensus about the need to accompany the possibilities offered by trade in development with other policies aimed at eradicating poverty. In this sense, different authors are manifested.

One example is Perry and Humberto (2006), who influence that:

“Trade liberalization appears to be most beneficial when parallel to progress in access to education, provision of infrastructure and credit, to put more workers and companies in a better position to compete in an enlarged market”.

And they add that there are arguments to justify that international trade leads to a reduction of inequality in:

“The least developed countries with a comparative advantage in the production of goods that are intensive in unskilled labor”.

Conde and Hurtado (2000) also point out that:

“Trade liberalization must be accompanied by an appropriate regulatory package guaranteeing the rights of all economic agents not only in their trade but also in other areas such as investment, competition rules or the protection of intellectual property rights intellectual”.

For this reason, if there really was a genuine desire to promote the development of the ACP countries, the EU would aim to liberalize its markets to all goods from ACP countries and not only to those that are not produced in European territory and which could not therefore be supplied to the European consumer. In fact,

the 2014-2020 financial perspective foresees an allocation of € 83 billion in aid to ACP countries - 7% of all budgeted for external action - although European protectionism beats the overall amount allocated to Official Development Assistance.

REFERENCES

- ARTOPOULOS, A.; FRIEL, D.; HALLAK, J. C. (2014): Levantando el velo doméstico: el desafío de exportar bienes diferenciados a países desarrollados. *Desarrollo Económico, Revista de Ciencias Sociales*, 53 (211), 285-311.
- BHAGWATI, J. (1965): *La economía de los países subdesarrollados*. Ediciones Guadarrama, Madrid.
- BONET MADURGA, A. (2007): La Cooperación al Desarrollo como Instrumento de la Política Comercial de la Unión Europea. Aplicaciones al caso de América Latina. *INTAL-ITD*, (27), 1-74.
- CLUB DE EXPORTADORES E INVERSORES (2004): *Fondos europeos*.
- CONDE LÓPEZ, F. – HURTADO OCAÑA, I. (2000): *Política Comercial de la Comunidad Europea*. Pirámide, Madrid.
- DODO, M. K. (2008): *La Reforma de la OCM del Plátano en la Unión Europea: estudio comparado de sus efectos sobre las exportaciones de Canarias y las Islas Barlovento*. Doctoral Thesis. Departament of Economic Structure and Development Economics. Faculty of Economics and Business. Universidad Autónoma de Madrid, Madrid.
- EUROPEAN COMMUNITY INFORMATION SERVICE (1966): Partnership in Africa: the Yaoundé Association. *Community Topics*, (26), 1-22.
- EUROPEAN UNION (2008): *Convertir el comercio en una herramienta de desarrollo. Ayuda al comercio: algunos ejemplos prácticos en distintas zonas del mundo*. Publications Office. General Direction of Commerce, Brussels.
- FIGUEROLA, B. (2013): Acuerdos de asociación económica con los países de África, Caribe y Pacífico. *Información Comercial Española*, (875), 93-108.
- GOLDBERG, P.; KHANDELWAL, A.; PAVCNIK, N.; TOPALOVA, P. (2009): *Multi-product Firms and Product Turnover in the Developing World: Evidence from India*. Forthcoming review of Economics and Statistics 92 (4), 1042-1049.
- GRYNBERG, R. (1998): The WTO incompatibility of the Lomé Convention trade provisions. *Asia Pacific School of Economics and Management* (98/3), 1-29.
- HAYASHIKAWA, M. (2009): Trading out of poverty: how aid for trade can help. *OECD Journal of Development*, 1-28.
- LLORCA RODRÍGUEZ, C. M^a.; CUENCA GARCÍA, E. (2005): Las relaciones comerciales de la UE con el grupo ACP. *Información Comercial Española* (824), 173-190.
- ORTEGA Y GASSET, J. (2011): *España Invertebrada* (ed. original 1921) Austral, Barcelona.
- PERRY, G. E. - LÓPEZ, J. H. (2006): Reducción de la pobreza, buen negocio para todos. *Política Exterior*, 20 (114), 141-152.
- SANAHUJA, J. A. (2014): Global development and emerging countries: challenges for the EU cooperation policy. *Revista CIDOB d'Afers Internacionals*, (108), 67-93.
- SERRANO SANZ, J. M. (1997): Sector exterior y desarrollo en la economía española contemporánea. *Papeles de Economía Española* (73), 308-335.
- SOTA RAMOS, J.; SUÁREZ LEOZ, D. (2001): *Cooperación al desarrollo en el sistema de la Unión Europea y de Naciones Unidas*.
- WITKER VELÁSQUEZ, J. (1984): *El régimen jurídico de los productos básicos en el comercio internacional*. Universidad Nacional Autónoma de México, Instituto de Investigaciones Jurídicas, Mexico.

STEWART INDEX AND COLLINEARITY: THE CASE OF RAISE REGRESSION

CLAUDIA GARCÍA GARCÍA

Programa de Doctorado en Ciencias Económicas y Empresariales/Facultad de Ciencias Económicas y Empresariales/Universidad de Granada
Campus Universitario de La Cartuja, 18071 Granada (España)/garciaclaudia@ugr.es

ROMÁN SALMERÓN GÓMEZ

Departamento de Métodos Cuantitativos para la Economía y la Empresa/Facultad de Ciencias Económicas y Empresariales/Universidad de Granada
Campus Universitario de La Cartuja, 18071 Granada (España)/romansg@ugr.es

CATALINA B. GARCÍA GARCÍA

Departamento de Métodos Cuantitativos para la Economía y la Empresa/Facultad de Ciencias Económicas y Empresariales/Universidad de Granada
Campus Universitario de La Cartuja, 18071 Granada (España)/cbgarcia@ugr.es

e-mail Claudia García García: garciaclaudia@ugr.es

Resumen

El problema de la multicolinealidad en el modelo econométrico se ha estudiado desde varias perspectivas a lo largo de la literatura. Podemos identificar dos tipos de multicolinealidad: perfecta y aproximada. La realmente problemática en la práctica es la segunda ya que permite al investigador estimar el modelo, al contrario que la multicolinealidad exacta, pero conduce a estimaciones inestables. Es posible distinguir dos tipos de multicolinealidad aproximada: esencial y no esencial. La primera hace referencia a la relación existente entre variables explicativas (sin tener en cuenta la constante), mientras que la segunda se centra en la relación entre la constante y el resto de las variables independientes del modelo. Stewart (1987) definió los *collinearity indices*, cuyo propósito era detectar la colinealidad aproximada existente en el modelo econométrico. El presente trabajo demuestra que el índice de Stewart es capaz de detectar la multicolinealidad no esencial existente en un modelo econométrico, al contrario que algunas medidas tradicionalmente utilizadas para detectar el problema, como el Factor de Inflación de la Varianza (FIV), que sólo detecta la colinealidad esencial. Además, este trabajo desarrolla el índice de Stewart para su aplicación en la regresión alzada. La regresión alzada, presentada por García et al. (2011), es una metodología que aparece como alternativa a la regresión cresta, tradicionalmente aplicada para la estimación de modelos con multicolinealidad grave. La contribución del trabajo se ilustra con una aplicación empírica.

Palabras clave: Multicolinealidad, Regresión cresta, Regresión alzada, Índice de Stewart.

Área Temática 9: Economía Cuantitativa. Métodos Cuantitativos para la Economía y la Empresa.

Abstract

The problem of multicollinearity in an econometric model has been studied from different perspectives among the literature. There are two principal types of multicollinearity: perfect and near. In practice, the most problematic is the second one because it allows the researcher to estimate the model, in contrast to perfect multicollinearity, but it leads to unstable estimations. Near multicollinearity can be split into two: essential and non-essential. The first one concerns the relationship between explanatory variables (excluding the constant), while the second regards to the relationship between the intercept and the rest of independent variables of the model. Stewart (1987) defined the *collinearity indices*, whose purpose was to detect the existing near collinearity in the econometric model. With the present work it has been demonstrated that the Stewart index is able to identify non-essential multicollinearity in an econometric model, in contrast to traditional measures used to detect the problem, as Variance Inflation Factor (VIF), that only detects essential collinearity. In addition, this work develops the Stewart index for its application in raise regression. Raise regression, presented by García et al. (2011), is a methodology that appears as an alternative to ridge regression, typically used to estimate models with strong multicollinearity. The contribution of the work is illustrated with an empirical application.

Key Words: Multicollinearity, Ridge regression, Raise regression, Stewart index.

Thematic Area 9: Quantitative Economy. Quantitative Methods for Economics and Business.

1. INTRODUCTION

The problem of multicollinearity in an econometric model has been studied from different perspectives among the literature. As Novales (1988), the important question in an empirical analysis is not to discuss the existence of multicollinearity, because it always exists (whatever two economic variables, they are always correlated). So, the debate is the dilemma of ignoring the problem because it is not a big deal, or not to ignore it. Thus, the key here is the degree of multicollinearity that exists in our empirical study. As Belsley and Klema (1974) reveal, there are three principal questions about the multicollinearity problem, those we can rewrite as follows:

1. What is multicollinearity and what are the principal consequences of it?
2. How can we detect the presence of multicollinearity in a specified model?
3. Is it possible to mitigate the problem?

A general definition we could make of multicollinearity is that it is a problem that consists of a lack of independency or the presence of interdependency between explanatory variables, Farrar and Glauber (1967). Once we know what is multicollinearity, we can distinguish between two principal types of multicollinearity: perfect and near. The most problematic is the second one because it allows the researcher to estimate the model, in contrast to perfect multicollinearity, but it leads to unstable estimations. Particularly, supposing that X is the matrix of independent variables, with near collinearity we will have a matrix $X^t X$ with complete range, but we will probably have the following “bad” properties:

- Inflated variances of the estimators.
- Tendency to consider the estimated parameters as non-significant (tendency to not reject the null hypothesis in tests of individual significance).
- High R^2 (tendency to consider the model globally significant).
- Unstable results (high sensibility of the estimations to small changes in the initial data).

In turn, near collinearity can be split into two: essential and non-essential multicollinearity. The first one concerns the relationship between explanatory variables taking the constant as one more, while the second one regards to the specific relationship between the intercept and the rest of independent variables of the model. Non-essential collinearity is easy to “solve” by centering the problematic variables, so researchers usually use centered variables and the problem does not usually appear in empirical studies. When we have another type of collinearity (essential collinearity) the solution to the problem is not to center the problematic variables, but to use alternative methodologies like ridge regression or raise regression. Anyway, the correct detection of the problem is an important step in any empirical application.

Stewart (1987) defined the collinearity indices, whose purpose was to detect the existing near collinearity in an econometric model. With the present work it has been demonstrated that the Stewart index is able to identify non-essential collinearity in an econometric model, in contrast to traditional measures used to detect the problem, as the Variance Inflation Factor (VIF). It is important to remark

here that Stewart relates its indices to the VIF (see Section 3), but the values only corresponds with those the data are centered.

One the other hand, to deal with this problem in practice, there have been appeared alternative methods to Ordinary Least Squares (OLS) estimation that allow us to mitigate collinearity problems in the model, as ridge regression. However, other methods have been emerged with better properties and better behaviour, like raise regression (García et al., 2011; García et al., 2017). This methodology introduces a “raise factor”, which modifies the problematic variable(s) and mitigates the problem.

Taking into account all the previous, with this work it may be concluded that:

1. It exists a relationship between the VIF and the Stewart index.
2. It has been developed the Stewart index for raise regression.
3. The Stewart index in raise regression is always lower than the value for OLS estimation, which indicates that the initial collinearity problem is mitigated.

For this work, we focus the theoretical study of the Stewart index in the raised variable because it is the problematic one (Section 3). In the empirical part (Section 4), we obtain the index for all the variables of the model. In future research, it will be interesting to further develop the index also in the case of the rest of explanatory variables.

The structure of this work is as follows: Section 2 presents two methodologies used to deal with collinearity in practice, ridge regression and raise regression, focusing on the second one. The Stewart index and its application in raise regression is presented in Section 3. Section 4 illustrates the contribution of the paper applying the methodology to an empirical example, and main conclusions are summarized in Section 5.

2. DEALING WITH COLLINEARITY: RAISE REGRESSION

Once we have detected the existence of high multicollinearity, we could apply an alternative methodology that allows us to mitigate the problem. Although ridge regression is the most used method in this field, this work uses an alternative and “novel” technique: raise regression.

Hoerl and Kennard (1970a, 1970b) introduced ridge regression, and it is a common methodology used in the treatment of collinearity between variables.

As it is known, starting from model $Y = X\beta + u$, where u is the random disturbance and it is spherical, the formula that leads the estimation of β using OLS is: $\hat{\beta} = (X^t X)^{-1} X^t Y$. Basically, ridge regression consists in adding a “constant value” in the estimation of β . With this, the method decreases the mean squared error of prediction by introducing a reasonable amount of bias into the model. Indeed, the ridge estimator is:

$$\hat{\beta} = (X^t X + kI)^{-1} X^t Y,$$

where k is the “constant value”, named as ridge factor, and I is the identity matrix. The traditional k value used in the literature is the one proposed by Hoerl et al.

(1975). However, many authors have proposed different estimations to obtain this biasing parameter (see García et al. (2019)).

Anyway, even the collinearity problems diminish, the calculations of R^2 and the experimental F statistic in ridge regression are uncertain because of the sum of squares decomposition is not verified. Due to these inconveniences, it emerges the raise regression that maintains the initial properties (experimental F, sum of squares, and R^2) and treat collinearity not only to obtain stable estimations, but also to analyse the causal effects of the driving forces affecting collinearity.

As we have said previously, due to the weaknesses of ridge regression (see Jensen and Ramirez, 2008), there have been emerged in recent years other type of methodologies, which allow the researcher to deal with collinearity problems. One of these alternatives is raise regression. This method has been presented by García et al. (2011) and fully developed in García et al. (2017). It is an alternative methodology to estimate models with multicollinearity, solving it from a geometrical point of view. Basically, raise regression maintains the available information and modifies the problematic variables to mitigate the problem. Starting from the linear model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$, the collinearity problem (essential collinearity) arises because vector x_1 and vector x_2 are very close geometrically, that is, the angle that determines both vectors, θ_1 , is very small (see Figure 1).

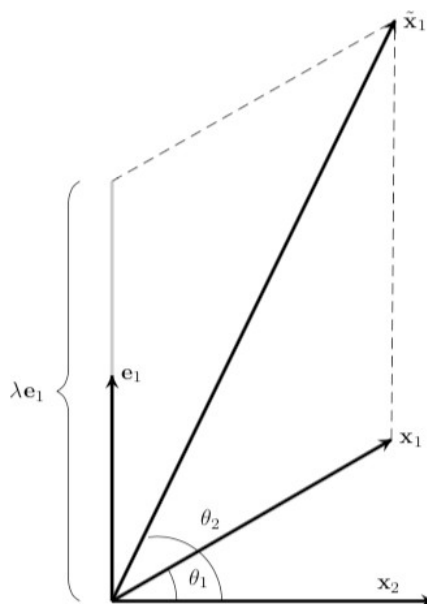


Figure 1. The geometrical perspective in raise regression.

The raise regression tries to separate the two problematic variables, x_1 and x_2 , through the auxiliary regression $x_1 = \alpha_0 + \alpha_1 x_2 + v$, whose estimation by OLS is

leads to the residuals named as e_1 . The separation between the variables is done by the use of these residuals, which are orthogonal to the independent variables of the auxiliary regression, which in this case is only x_2 (and the intercept, if we consider it one of the explanatory variables). Then, the raise vector, defined as $\tilde{x}_1 = x_1 + \lambda e_1$, with $\lambda > 0$, substitutes the original variable in the initial model:

$$y = \beta_0 + \beta_1 \tilde{x}_1 + \beta_2 x_2 + w.$$

Regarding the global properties of this method, we could say the following interesting issues (see Salmerón et al., 2017):

- The squared sums of the residuals of the original model and the modified model are the same.
- The estimated variance of the random disturbance does not change.
- The coefficient of determination, R^2 , is still the same.
- The global significance test remains unchanged.
- The original model and the raised one provide the same prediction.

3. THE STEWART INDEX

Stewart (1987) defined the *collinearity indices*, whose purpose was to detect the existing near collinearity in the econometric model. The Stewart index, usually named as k_i^2 for variable i , is able to identify essential but also non-essential collinearity in an econometric model, in contrast to VIF, for example, which only detects essential collinearity (see Salmerón et al., 2018). In this work, we will name the index as SI_i to avoid any mistake with regard to ridge factor, named as k .

Let X_{-i} be the matrix X without variable i , and X_i variable i . SI_i is defined as:

$$SI_i = \frac{X_i^t X_i}{X_i^t X_i - X_i^t X_{-i} (X_{-i}^t X_{-i})^{-1} X_{-i}^t X_i},$$

It is verified that if $X_i X_{-i} = 0$, then $SI_i = 1$. Furthermore, as $X_{-i} X_{-i}$ is a positive-definite matrix, when $X_i X_{-i} \neq 0$, $SI_i > 1$.

Starting from model $Y = X\beta + u$, for n observations and p explanatory variables ($i = 1, \dots, p$), including the intercept, the value for SI_i in each case is expressed in Table 1.

Taking $i = 1$ as the intercept, and being \acute{X}_{-1} a matrix that contains the sum of all the individuals for each variable (excluding the constant), thus its dimension is $1 \times (p - 1)$, with SI_1 we are measuring the orthogonality of the constant with the rest of explanatory variables (the non-essential collinearity of the model). As $X_{-1} X_{-1}$ is a positive-definite matrix, then $SI_1 > 1$; if $SI_1 = 1$, then $\acute{X}_{-1} = 0$: all the explanatory variables are centered and there is no non-essential collinearity (SI_1 have its minimum value).

Table 1. Values for the Stewart index depending on the variable.

Variable		SI_i	Orthogonality	Collinearity
$i = 1$	The intercept	$\frac{1}{1 - \frac{1}{n} \acute{X}_{-1} (X_{-1}^t X_{-1})^{-1}}$	Between the constant and the rest of explanatory variables	Non-essential
$i \neq 1$	The rest of explanatory variables (excluding the constant)	$\frac{X_i^t X_i}{SSR_i}$	Between explanatory variables	Essential Non-essential ¹

Taking $i \neq 1$, we are measuring the orthogonality of the analysed variable i with the rest of explanatory variables of the model. SSR_i and SST_i represent the residual sum of squares and the total sum of squares, respectively, of the regression $X_i = X_{-i} \alpha + v$. Here, the index can be expressed as a function of the VIF. As $X_i^t X_i = n \cdot (\text{var}(X_i) + \acute{X}_i^2) = SST_i + n \cdot \acute{X}_i^2$, and $VIF_i = \frac{SST_i}{SSR_i}$, then:

$$SI_i = VIF_i + n \cdot \frac{\acute{X}_i^2}{SSR_i}.$$

Thus, it has been demonstrated that it exists a relationship between the VIF and the Stewart index, but this relationship only appears when we are analysing the rest of explanatory variables ($i \neq 1$), not the constant, and only coincides when variables are centered. Finally, as $VIF_i \geq 1$ and $n \cdot \acute{X}_i^2$ and SSR_i are higher than 0, then $SI_i \geq 1$.

3.1. THE STEWART INDEX IN RAISE REGRESSION

We have defined the “classical” Stewart index to detect collinearity in a linear model. Now, lets suppose variable X_i is raised. Then, the raised model will be $Y = \widetilde{X} \beta + w$, where $\widetilde{X} = X M_\lambda$, with

¹ SSR_i takes into account the constant.

$$M_\lambda = \begin{pmatrix} 1 & 0 & \dots & -\lambda \hat{\alpha}_1 & \dots & 0 \\ 0 & 1 & \dots & -\lambda \hat{\alpha}_2 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & -\lambda \hat{\alpha}_{i-1} & \dots & 0 \\ 0 & 0 & \dots & (1+\lambda) & \dots & 0 \\ 0 & 0 & \dots & -\lambda \hat{\alpha}_{i+1} & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & -\lambda \hat{\alpha}_p & \dots & 1 \end{pmatrix}.$$

In this model, we have the raised variable $\tilde{X}_i = X_i + \lambda e_i$, where $\lambda > 0$ and e_i are the estimated residuals from regression $X_i = X_{-i} \alpha + v$, with $X_{-i} = (X_1, X_2, \dots, X_{i-1}, X_{i+1}, \dots, X_p)$, and X_1 being the intercept. Thus, in this case we may distinguish between the raised variable and the rest of explanatory variables. For this work, we only focus this theoretical study on the raised variable because is the problematic one. In future research, it will be interesting to develop the formula also in the case of the rest of explanatory variables.

To summarize, with raise regression we have:

- The raised variable, \tilde{X}_i .
- The estimated residuals of the auxiliary regression: $e_i = X_i - X_{-i} \hat{\alpha}$, where $\hat{\alpha} = (X_{-i}^t X_{-i})^{-1} X_{-i}^t X_i$.

The index for the raised variable i would be:

$$SI_i = \frac{\tilde{X}_i^t \tilde{X}_i}{\tilde{X}_i^t \tilde{X}_i - \tilde{X}_i^t X_{-i} (X_{-i}^t X_{-i})^{-1} X_{-i}^t \tilde{X}_i}.$$

Furthermore, we might do the following transformations:

$$\begin{aligned} SSR_i &= e_i^t e_i = (X_i - X_{-i} \hat{\alpha})^t (X_i - X_{-i} \hat{\alpha}) = \hat{\imath} \\ &\hat{\imath} X_i^t X_i - X_i^t X_{-i} \hat{\alpha} - \hat{\alpha} X_{-i}^t X_i + \hat{\alpha} X_{-i}^t X_i \hat{\alpha} = \hat{\imath} \\ &\hat{\imath} X_i^t X_i - X_i^t X_{-i} \hat{\alpha} - \hat{\alpha} X_{-i}^t X_i + \hat{\alpha} X_{-i}^t X_i \hat{\alpha} = \hat{\imath} \hat{\imath} X_i^t X_i - X_i^t X_{-i} \hat{\alpha} = \hat{\imath} \\ &\hat{\imath} X_i^t X_i - X_i^t X_{-i} (X_{-i}^t X_{-i})^{-1} X_{-i}^t X_i. \end{aligned}$$

In addition,

$$\tilde{X}_i^t \tilde{X}_i = [X_i^t + \lambda e_i^t] \cdot [X_i + \lambda e_i] = X_i^t X_i + \lambda X_i^t e_i + \lambda e_i^t X_i + \lambda^2 e_i^t e_i = X_i^t X_i + SSR_i (2\lambda + \lambda^2).$$

As $e_i^t X_{-i} = X_{-i}^t e_i = 0$:

- $\tilde{X}_i^t X_{-i} = [X_i^t + \lambda e_i^t] \cdot X_{-i} = X_i^t X_{-i}$.

$$- X_{-i}^t \tilde{X}_i = X_{-i}^t \cdot [X_i + \lambda e_i] = X_{-i}^t X_i.$$

Thus, with the above expressions, the previous formula may be transformed into the following:

$$SI_i(\lambda) = \frac{X_i^t X_i + SSR_i(2\lambda + \lambda^2)}{X_i^t X_i + SSR_i(2\lambda + \lambda^2) - X_{-i}^t X_{-i} (X_{-i}^t X_{-i})^{-1} X_{-i}^t X_i}.$$

And the final formula would be:

$$SI_i(\lambda) = \frac{X_i^t X_i + SSR_i(2\lambda + \lambda^2)}{SSR_i(1 + \lambda)^2}.$$

So, with the above expressions, we may conclude the following things:

Conclusion 1: If $\lambda = 0$, then $SI_i(0) = \frac{X_i^t X_i}{SSR_i}$, that is the classical Stewart index SI_i .

This is because the value of λ equal to 0 leads to the traditional OLS estimation.

Conclusion 2: If λ tends to infinity, then $SI_i(\lambda) = 1$.

Conclusion 3: It can be demonstrated that $SI_i(\lambda) \geq 1$.

Starting from the idea that $SI_i(\lambda) < 1$, lets proof that by contraposition:

$$SI_i(\lambda) < 1 \iff X_i^t X_i + SSR_i(2\lambda + \lambda^2) < SSR_i(1 + \lambda)^2 \iff \\ \iff X_i^t X_i - SSR_i < 0 \iff SST_i + n \cdot \dot{X}_i^2 - SSR_i < 0 \iff \iff SSE_i + n \cdot \dot{X}_i^2 < 0,$$

and we know that $SSE_i \geq 0$ and $n \cdot \dot{X}_i^2 \geq 0$, so it is impossible that $SSE_i + n \cdot \dot{X}_i^2 < 0$, it is also impossible that $SI_i(\lambda) < 1$, so then $SI_i(\lambda) \geq 1$.

Conclusion 4: It can be demonstrated that $SI_i(\lambda)$ is always lower (or equal in case of $\lambda = 0$) than the value of the classical Stewart index for variable i .

To demonstrate this fact, lets prove that the derivative is decreasing in λ :

$$\frac{\partial SI_i(\lambda)}{\partial \lambda} = \dot{i} \\ \dot{i} \frac{SSR_i(2+2\lambda) \cdot SSR_i(1+\lambda)^2 - [X_i^t X_i + SSR_i(2\lambda + \lambda^2)] \cdot SSR_i(2+2\lambda)}{SSR_i^2 \cdot (1+\lambda)^4} = \dot{i} \\ \dot{i} \frac{SSR_i(2+2\lambda) \cdot [SSR_i - X_i^t X_i]}{SSR_i^2 \cdot (1+\lambda)^4} = \dot{i}$$

$$\begin{aligned} \dot{I} &= \frac{SSR_i(2+2\lambda) \cdot [SSR_i - SST_i - n \cdot \dot{X}_i^2]}{SSR_i^2 \cdot (1+\lambda)^4} \\ \dot{I} &= \frac{SSR_i(2+2\lambda) \cdot [SST_i + n \cdot \dot{X}_i^2 - SSR_i]}{SSR_i^2 \cdot (1+\lambda)^4} \\ \dot{I} &= \frac{SSR_i(2+2\lambda) \cdot (SSE_i + n \cdot \dot{X}_i^2)}{SSR_i^2 \cdot (1+\lambda)^4}, \end{aligned}$$

and we know that SSR_i is positive, $\lambda > 0$ and $(SSE_i + n \cdot \dot{X}_i^2)$ cannot be negative, as we demonstrated in *Conclusion 3*, thus, if $\left[\frac{SSR_i(2+2\lambda) \cdot (SSE_i + n \cdot \dot{X}_i^2)}{SSR_i^2 \cdot (1+\lambda)^4} \right]$ is positive, then the previous expression is lesser than 0, and we could say the derivative of the Stewart index is decreasing in λ .

4. EMPIRICAL APPLICATION

Once we have explained the methodology, lets illustrate the contribution of the paper through an empirical example. To that end, we will use the well-known STIRPAT model. The STIRPAT model is usually used in environmental economics, and it emerged as the stochastic version of the IPAT identity (Dietz and Rosa, 1994, 1997) to analyse the influence or the impact of population, affluence (per capita GDP), and technology on the environment of a country. It is a tool that allows the researcher to modelling the environmental impact of a country or a group of countries.

For this work, we will use data from China (1990-2014) for CO₂ emissions (the dependent variable I), and four explanatory variables: the intercept, population (P), per capita GDP (A) and industrialization (% of GDP) (T). The dataset has been extracted from the World Bank website and all data are expressed in logarithms.

The used model (the original model) is the following:

$$I = \beta_0 + \beta_1 P + \beta_2 A + \beta_3 T + u,$$

where u is the error term and it is spherical.

Table 2 shows the results for OLS estimation. In this Table, apart from the estimated parameters, their significance and the global characteristics of the model, we have included also three collinearity measures: the VIF, the Condition Number (CN) and the Stewart index. In the case of VIF, Hoerl and Kennard (1970a,b) show that values for VIFs lower than 10 indicate no strong collinearity (some authors set the VIF threshold to 4; O'Brien, 2007). For CN, following Belsley et al. (1980), we will say that a value lower than 20 implies light collinearity, between 20 and 30, moderate collinearity, and values higher than 30 imply strong

collinearity. The values of these two measures reveal that there exist strong collinearity problems.

In addition, by paying attention to the results of the Stewart index, the high values of this measure reveal that there is essential and non-essential collinearity in the model because, as we have seen before, values close to 1 imply there is no collinearity problems.

Table 2. OLS estimations².

Variable	Estimated parameter (t statistic)	
<i>Intercept</i>	157.834* (8.821)	
<i>P</i>	-7.676* (-8.807)	
<i>A</i>	1.421* (19.458)	
<i>T</i>	1.865* (4.315)	
GLOBAL CHARACTERISTICS		
R²	0.9931	
F-statistic (p-value)	1008 (0.000) *	
COLLINEARITY		
CN	5821.856	
VIF	<i>P</i>	28.625
	<i>A</i>	28.374
	<i>T</i>	1.606
Stewart index	<i>Intercept</i>	4159553.403
	<i>P</i>	4334854.344
	<i>A</i>	4940.595
	<i>T</i>	29161.208

Following works as Dalal and Zickar (2012), Iacobucci et al. (2016), Marquardt (1980), Marquardt and Snee (1975), Smith and Campbell (1980) or Snee and Marquardt (1984), among others, we could say that centering explanatory variables is a good method to mitigate non-essential collinearity. Thus, first of all, we have to center the explanatory variables.

By observing Table 3, we might see that the estimated values remain constant for all the explanatory variables except in the case of the intercept. Regarding the collinearity, the CN has decreased in a huge amount, and also the values of the Stewart index. This fact is due to the mitigation of non-essential collinearity.

Additionally, it is clear that now the intercept does not cause problems in the model ($SI_1 = 1$). Regarding the values of the Stewart index of the rest of explanatory variables, it can be observed that they are equal to VIFs for each variable. The Stewart index for variables $i \neq 1$ (explanatory variables excluding the constant)

² * mean the parameter is statistically significant at 0.01 (99% level of confidence).

when non-essential collinearity is mitigated captures essential collinearity, and so the VIF do, thus it is logical that the two measures have the same value: the non-essential collinearity is actually “solved”, and the only problematic one for now is essential collinearity.

Table 3. OLS estimation (centered data)³.

Variable	Estimated parameter (t statistic)	
<i>Intercept</i>	15.383* (1753.336)	
<i>P</i>	-7.676* (-8.807)	
<i>A</i>	1.421* (19.458)	
<i>T</i>	1.865* (4.315)	
GLOBAL CHARACTERISTICS		
R²	0.9931	
F-statistic (p-value)	1008 (0.000) *	
COLLINEARITY		
CN	11.817	
VIF	<i>P</i>	28.625
	<i>A</i>	28.374
	<i>T</i>	1.606
Stewart index	<i>Intercept</i>	1.000
	<i>P</i>	28.625
	<i>A</i>	28.374
	<i>T</i>	1.606

To mitigate essential collinearity, we are going to apply raise regression, explained in Section 2. The chosen variable to be raised is the most problematic (the one that has the highest value of VIF and Stewart index): population (*P*). The value of λ will be the one that makes VIFs lesser than 10, which means essential collinearity problems are mitigated: $\lambda=0.785$.

Table 4. Raise regression estimation (centered data)⁴.

Variable	Estimated parameter (t statistic)
<i>Intercept</i>	15.383* (1753.336)
\tilde{P}	-4.300* (-8.807)
<i>A</i>	1.146* (26.442)

³ * mean the parameter is statistically significant at 0.01 (99% level of confidence).

⁴ * mean the parameter is statistically significant at 0.01 (99% level of confidence).

T		2.037* (4.732)
GLOBAL CHARACTERISTICS		
R^2		0.9931
F-statistic (p-value)		1008 (0.000) *
COLLINEARITY		
CN		6.790
VIF	\tilde{P}	9.670
	A	9.995
	T	1.595
Stewart index	<i>Intercept</i>	1.000
	\tilde{P}	9.670
	A	9.995
	T	1.595

Table 4 shows the final results. In this Table, we have included the raise regression for centered variables. By using raise regression, we have much more suitable results for making empirical interpretations:

- Regarding the estimated parameters: all of them are individually significant at 99% of confidence and the obtained values are consistent with theory and characteristics of the data: following Malthus (1973), who defends the pressure that growth puts on resources, it would be correct to think that all explanatory variables have a positive impact on the environment, however, P has a negative sign. It has to be taken into account that we are modelling data from China, whose population is one of the greatest in the world, so, relatively, the negative sign is logical if we compare the pollution with regard to the total of population, and also the country's total surface area, even China were the most pollutant country as well. For its part, the estimated parameters for variables A and T have a positive sign. The goodness of the model can be observed by the global characteristics of it: the model is globally significant and we have a high R^2 .
- Attending to collinearity, initial problems are mitigated: $CN < 20$, $VIFs < 10$ and much lesser values of the Stewart index (1.000 for the constant and equal to the VIFs for the rest of explanatory variables).

5. MAIN CONCLUSIONS

Taking into account all the previous, the principal conclusions of this work are the following:

1. It exists a relationship between the VIF and the Stewart index.
When we have centered data, the value of the Stewart index coincides with the VIF. It has been demonstrated in Section 3, and it has been also shown with the empirical example.
2. It has been developed the Stewart index for raise regression.
In this case, it has been obtained the simplified formula for the raised variable, because, as we have said in previous Sections, it is the controversial one. In future research it would be interesting to develop the alternative expression for the rest of explanatory variables (the non-modified ones).
3. The Stewart index in raise regression is always lower than the value for OLS estimation.
This last point has been demonstrated methodologically in Section 3, and it has been shown with an example in the empirical part (Section 4).

In addition to the above conclusions, it is clear that paying attention to measures that detect only essential collinearity (as VIF) is not the best way to treat potential strong collinearity problems. It is important to use also measures that detect non-essential collinearity as well, like Stewart index. By only using essential collinearity measures, other important problem may be rejected, even though essential collinearity has been mitigated.

Finally, to sum up and conclude, it is very important to have correct measures for detecting collinearity in an econometric model, particularly, near collinearity. If we do not indentify properly the type, the problem still remains, we are not able to separate the individual effects of the explanatory variables, the final results will not show the reality and the estimated parameters and their importance in the model will be distorted.

REFERENCES

- BELSLEY, D.A.; KLEMA, V.C. (1974): Detecting and assessing the problems caused by multicollinearity: A use of the singular-value decomposition. *NBER Working Paper Series, 1974*. Working Paper No. 66.
- BELSLEY, D.A.; KUH, E.; WELSCH, R.E. (1980): *Regression diagnostics: Identifying influential data and sources of collinearity*. John Wiley & Sons, New York.
- DALAL, D.K.; ZICKAR, M.J. (2012): Some Common Myths About Centering Predictor Variables in Moderated Multiple Regression and Polynomial Regression. *Organizational Research Methods*, 15(3), 339-362.
- DIETZ, T.; ROSA, E.A. (1994): Rethinking the environmental impacts of population, affluence and technology. *Human Ecology Review*, 1, 277-300.
- DIETZ, T.; ROSA, E.A. (1997): Effects of population and affluence on CO2 emissions. *Proceedings of the National Academy of Sciences of the USA*, 94(1), 175-179.

- FARRAR, D.E.; GLAUBER, R.R. (1967): Multicollinearity in regression analysis: the problem revisited. *The Review of Economic and Statistics*, 92-107.
- GARCÍA, C.; SALMERÓN, R.; GARCÍA, C.B. (2019): Choice of the ridge factor from the correlation matrix determinant. *Journal of Statistical Computation and Simulation*, 89(2), 211-231.
- GARCÍA, C.B.; GARCÍA, J.; SOTO, J. (2011): The raise method: An alternative procedure to estimate the parameters in presence of collinearity. *Quality & Quantity*, 45(2), 403-423.
- GARCÍA, J.; SALMERÓN, R.; GARCÍA, C.B.; LÓPEZ-MARTÍN, M.M. (2017): The raise estimators. estimation, inference and properties. *Communications in Statistics-Theory and Methods*, 46(13), 6446-6462.
- HOERL, A.E.; KENNARD, R.W. (1970a): Ridge Regression: Biased Estimation for Northogonal Problems. *Technometrics*, 12(1):55-67.
- HOERL, A.E.; KENNARD, R.W. (1970b): Ridge Regression: Applications to Northogonal Problems. *Technometrics*, 12(1):69-82.
- HOERL, A.E.; KENNARD, R.W.; BALDWIN, K.F. (1975): Ridge Regression: Some simulation. *Communications in Statistics-Theory and Methods*, 4(2):105-123.
- IACOBUCCI, D.; SCHNEIDER, M.J.; POPOVICH, D.L. ; BAKAMITSOS, G.A. (2016): Mean centering helps alleviate “micro” but not “macro” multicollinearity. *Behavior research methods*, 48(4), 1308-1317.
- JENSEN, D.R.; RAMIREZ, D.E. (2008): Anomalies in the Foundations of Ridge Regression. *International Statistical Review*, 76(1), 89-105.
- MALTHUS, T.R. (1973): *Essay on the principle of population*. JM Dent.
- MARQUARDT, D.W. (1980): A Critique of Some Ridge Regression Methods: Comment. *Journal of the American Statistical Association*, 75(369), 87-91.
- MARQUARDT, D.W.; SNEE, S.R. (1975): Ridge Regression in Practice. *Journal of the American Statistical Association*, 29(1), 3-20.
- NOVALES, A. (1988): *Econometría*. McGraw-Hill, Madrid.
- O'BRIEN, R.M. (2007): A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity*, 41, 673-690.
- SALMERÓN, R.; GARCÍA, C.B.; GARCÍA, J. (2018): Variance Inflation Factor and Condition Number in multiple linear regression. *Journal of Statistical Computation and Simulation*, 88(12), 2365-2384.
- SALMERÓN, R.; GARCÍA, C.B.; GARCÍA, J.; LÓPEZ MARTÍN, M.M. (2017): The raise estimator estimation, inference, and properties. *Communications in Statistics-Theory and Methods*, 46(13), 6446-6462.
- SMITH, G.; CAMPBELL, F. (1980): A Critique of Some Ridge Regression Methods. *Journal of the American Statistical Association*, 75(369), 74-81.
- SNEE, R.D.; MARQUARDT, D.W. (1984): Comment: Collinearity diagnostics depend on the domain of prediction, the model, and the data. *The American Statistician*, 38(2), 83-87.
- STEWART, G.W. (1987): Collinearity and Least Squares Regression. *Statistical Science*, 2(1), 68-100.

FLORICULTURA EN EL SUR DEL ESTADO DE MÉXICO: PRECARIEDAD SALARIAL GENERADORA DE COSTOS SOCIALES

ELIZABETH REYES ORTÍZ

Centro Universitario UAEM Tenancingo/Universidad Autónoma del Estado de México.
Carretera Tenancingo-Villa Guerrero km 1.5, Tenancingo, Estado de México, México.

JESSICA ALEJANDRA AVITIA RODRÍGUEZ

Centro Universitario UAEM Tenancingo/Universidad Autónoma del Estado de México.
Carretera Tenancingo-Villa Guerrero km 1.5, Tenancingo, Estado de México, México.

JAVIER JESÚS RAMÍREZ HERNÁNDEZ

Centro de Estudios e Investigación en Desarrollo Sustentable (CEDeS)
Mariano Matamoros # 1007, Colonia Universidad, Toluca, Estado de México.

e-mail Elizabeth Reyes Ortiz: elizabethreyesortiz@outlook.com

Resumen

La floricultura es una agroindustria importante en algunas zonas del mundo, en México se concentra en el sur del Estado de México, es una actividad relevante debido a la generación de empleo e ingresos. En la producción florícola se busca la competitividad a través de precios bajos, dejando en segundo plano la calidad del producto; el precio es bajo dada la reducción de costos de producción basados en niveles salariales bajos que no incluyen prestaciones sociales (sanidad, paro, retiro). El objetivo de la investigación es analizar los costos de producción en tres sistemas de producción de rosa (orgánico, integrado y convencional), así, la inferencia de costos sociales originados en la precariedad salarial. El referente teórico consiste en el estudio de la capacidad de generación de valor en las unidades de producción; de acuerdo con la ventaja competitiva la generación de valor puede lograrse a través liderazgo en costos o por medio de la diferenciación del producto. La metodología consiste en la estimación de los costos de producción, entre ellos los laborales, para cada sistema de producción, en donde la estructura de costos incluye la retención de impuestos y declaración de pagos de prestaciones del trabajador. Dicha estructura permite estimar los salarios brutos y los salarios netos. Los resultados muestran que, en los tres sistemas de producción los salarios brutos equivalen a los netos pues no hay retención de las prestaciones sociales. Los tres sistemas de producción presentan diferencias de niveles de costos entre ellos; a su vez, el salario pagado con prestaciones y sin prestaciones tiene un diferencial entre 5% a 7%, este porcentaje representaría el costo social de la floricultura (reducción del bienestar social), se concluye que se busca una mayor competitividad por precios bajos a costa de la precariedad laboral generando costos sociales.

Palabras claves: Costos sociales, Competitividad, Floricultura, Estado de México, Sistema de producción.

Eje Temático 2: Economía Nacional, Regional y Local

FLORICULTURE IN THE SOUTH OF THE STATE OF MEXICO: SALARIAL PRECARIETY THAT GENERATES SOCIAL COSTS.

Abstract

Floriculture is an important agroindustry in some areas of the world, in Mexico it is concentrated in the south of the State of Mexico, it is a relevant activity due to the generation of employment and income. In the floriculture production competitiveness searches through lower prices, leaving the background product quality; the price is low given the reduction of production costs based on low salary levels that do not include social benefits (health, unemployment, retirement). The objective of the research is to analyze the production costs in three systems of rose production (organic, integrated and conventional), thus, the inference of social costs is originated in the precariousness of salary. The theoretical referent consists of the study of the capacity to generate value in the production units; according to the competitive advantage, the generation of value can be achieved through cost leadership or product differentiation. The methodology consists in estimating production costs, including labor costs, for each production system, where the cost structure includes withholding taxes and reporting employee benefits payments. This structure allows estimating gross wages and net salaries. The results show that, in the three production systems, gross salaries are equivalent to net ones, as there is no retention of social benefits. The results show that in the three production systems gross salaries are equivalent to the net because of there is no retention of social benefits. The three production systems present differences in cost levels between them; in turn, the salary paid with and without benefits has a differential between 5% to 7%, this percentage would represent the social cost of floriculture (reduction of social welfare), It is concluded that a greater competitiveness is by way of low prices at the expense of labor precariousness generating social costs.

Key Words: Social costs, Competitiveness, Floriculture, State of Mexico, Production system.

1. INTRODUCCIÓN

En el sur del Estado de México la principal actividad económica y sustento de muchas familias es la floricultura, la cual, representa alrededor del 80% de la producción florícola nacional (Bautista, 2006). La región productora de flores en el Estado de México se delimita principalmente a tres municipios: Villa Guerrero, Tenancingo y Coatepec Harinas, los cuales representan el 94.25% del valor de producción, denominándolo, así como corredor florícola (Ramírez, Avitia y Oregón, 2015).

Para el sur del Estado de México la floricultura es una de las principales actividades económicas; convirtiéndose en una fuente importante de empleos en la región. En México existen aproximadamente 10 mil productores dedicados al cultivo de la flor, con una extensión cercana a las 22 mil hectáreas, de las cuales 12,884 hectáreas (52 por ciento) se dedican al cultivo de ornamental, generando 188 mil empleos permanentes, 50 mil eventuales y un millón de empleos indirectos (Mejía, 2017).

Sin embargo, los productores presentan diferencias pues en la actualidad existen tres formas de producción agrícola: producción convencional o intensiva, integrada y orgánica (Sierra, 2016). La producción convencional o intensiva se basa en un alto consumo de insumos externos al sistema productivo natural (abonos, químicos sintéticos y pesticidas), este tipo de producción no toma en cuenta el medio ambiente, sus ciclos naturales, el uso racional ni sostenible de los recursos naturales (Nichols, 2007). La producción integrada hace una combinación en el uso de insumos químicos y orgánicos. Mientras que la agricultura orgánica es un sistema de producción que trata de utilizar al máximo los recursos naturales, dándole énfasis a la fertilidad del suelo y la actividad biológica y al mismo tiempo no utiliza fertilizantes y plaguicidas sintéticos para protección del medio ambiente y la salud humana (FAO, 2003).

El negocio de la venta de flor de corte está muy competido, la sobre oferta ha tenido como consecuencia la baja de los precios, lo cual ejerce una importante presión sobre los productores florícolas para mejorar su rentabilidad (Páez, 2008).

Lo que en países como México lleva a dos realidades. La primera es que los trabajadores agrícolas se encuentran desprotegidos, son pocos los que reciben protección social, generando así costos sociales. El costo social es el costo total o pérdida de bienestar social que debe pagar la sociedad cuando se hace uso de los recursos (Blanco y Díaz, 2005). La segunda son sistemas de producción basados en sistemas de producción convencional o intensivo, que genera recursos económicos gracias a la maximización de la producción comercial de plantas como: flores de corte, plantas ornamentales, follaje y bulbos de flor (Promueve Hidroponia, 2014). Generando problemáticas ambientales, económicas y sociales derivados de los sistemas de producción convencionales.

Por tanto, el objetivo de esta investigación es analizar los costos de producción en tres tipos de producción de rosa de corte (orgánico, integrado y convencional), así, la determinación de costos sociales originados en la precariedad salarial. La revisión de la literatura se centra en el adentrarse al trabajo agrícola en México y de los sistemas de producción, la metodología consiste en la estimación de los costos de producción, entre ellos los laborales, para cada producción, en donde la

estructura de costos incluye la retención de impuestos y declaración de pagos de prestaciones del trabajador.

2. ANTECEDENTES

Para elevar la productividad y rentabilidad del campo, se buscaron estrategias basadas en el uso intensivo de productos químicos, fertilizantes sintéticos, semillas transgénicas, combustibles y agrotóxicos arrojados sin control (Ortega, 2009). Este tipo de proceso de producción tan intensivo genera externalidades negativas en el ámbito económico, social y ambiental, las cuales han sido ignoradas, entre las cuales se encuentran: la disminución de fertilidad natural, debilitamiento de los suelos, estancamiento de rendimientos, rentabilidades decrecientes ocasionados por el continuo incremento en el volumen de insumos que ha llegado a hacerse imprescindible, el riesgo para la salud humana por el deterioro de aguas superficiales y a la toxicidad de productos agrarios (Moya, 1994).

Las raíces de estos problemas residen en el contexto socioeconómico en el que se originó la mayor parte de la agroindustria moderna. Desde el principio, la ciencia agrícola estuvo orientada a aumentar al máximo la productividad del factor limitante al desarrollo económico: la mano de obra; originando una mecanización temprana que condujo al monocultivo. Enfocándose en la creación de fertilizantes y pesticidas químicos que permitirían reemplazar a las prácticas de fertilización más laboriosas (aplicación de estiércol y la rotación de cultivos) por un simple compuesto químico (Rosset, 1998).

El proceso de producción convencional debe ser entendido como aquel busca aumentar la producción y disminuir sus costos mediante el uso de insumos como semillas, monocultivo y productos sintéticos como fertilizantes, pesticidas y herbicidas; los cuales son utilizados de forma intensiva e inadecuada generando problemas ambientales, económicos y sociales. Como respuesta a esta problemática aparecen diversos procesos alternativos de agricultura, entre ellos, el proceso de producción integrado y el orgánico.

Para Muñoz (2014) la producción integrada es un tipo de producción a medio camino entre la agricultura intensiva y la ecológica, que utiliza técnicas compatibles encaminadas a la protección del medio ambiente y a la conservación del agua, el aire, el suelo y el paisaje combinados con el uso mínimo de productos químicos, motivo por el cual se le considera el punto de partida para la “transición agroecológica” o “reconversión”. La producción integrada pretende conseguir una agricultura sostenible que dé respuestas a las nuevas exigencias sociales en cuanto a la calidad de los productos (unos alimentos más sanos y naturales) y el respeto al medio ambiente (Muñoz, 2014).

La producción integrada es un punto intermedio entre la agricultura intensiva y la orgánica, que combina métodos naturales y químicos, permitiendo el uso de agroquímicos, pero de forma controlada y justificada, siempre de acuerdo con las normas técnicas de cada cultivo, motivo por el cual se le considera el punto de partida para la “transición o reconversión”, garantizando la protección al medio ambiente, la productividad agrícola y una agricultura sostenible.

Para El-Hage y Hattam (2003) el término agricultura orgánica se refiere al proceso que utiliza métodos que respetan el ambiente, desde las etapas de producción

hasta las de manipulación y procesamiento. La producción orgánica no solo se preocupa del producto, sino también de todo el sistema que se usa para producir y entregar el producto al consumidor final.

El Departamento de Agricultura de Estados Unidos (1984) define a la agricultura orgánica: "un sistema de producción que evita o excluye ampliamente el uso de fertilizantes, plaguicidas, reguladores del crecimiento y aditivos para la alimentación animal. Estos sistemas se basan en la rotación de cultivos, utilización de estiércol de animales, leguminosas, abonos verdes, residuos orgánicos originados fuera del predio, cultivo mecánico, minerales naturales y aspectos de control biológico de plagas para mantener la estructura y productividad del suelo, aportar nutrientes para las plantas y controlar insectos, malezas y otras plagas".

Así, la agricultura orgánica es un sistema de producción que sustituye el uso de compuestos sintéticos por la rotación de cultivos y la utilización de insumos naturales originados fuera del predio con el fin de lograr agroecosistemas óptimos y sostenibles desde el punto de vista social, ambiental y económico.

2.1. COSTOS ECONÓMICOS, AMBIENTALES Y SOCIALES DE LOS SISTEMAS DE PRODUCCIÓN

De acuerdo con Rosset (1998) la agricultura convencional propone nuevas tecnologías y uso de insumos que ha ocasionado que los agricultores caigan en una situación de insolvencia, ocasionada por los cada vez más altos costos en los que tienen que incurrir para poder adquirir tecnología e insumos, pues han tenido que endeudarse lo cual les ha dejado pequeños márgenes de ganancia, mismos que no son suficientes para cubrir los intereses de su deuda. Es importante reducir drásticamente la dependencia en insumos y equipos externos para ayudar a los agricultores a salir de esta crisis.

El proceso de producción convencional se caracteriza por cultivar un único tipo de semilla, aumenta la productividad en un periodo corto gracias al uso de productos químicos, se utilizan plaguicidas contra insectos u hongos y se gastan enormes cantidades de energía (Tecnologías Agrarias, 2013). Dicho proceso productivo genera repercusiones o externalidades a diferentes escalas, entre las cuales destacan, la disminución de fertilidad natural, debilitamiento y pérdida de espesor de suelos, deforestación, estancamiento de rendimientos y riesgo para la salud humana (Moya, 1994).

Por otro lado, este tipo de sistema, y debido al uso intensivo de productos químicos, afecta a la salud de los seres humanos. Entre las afectaciones a la salud se encuentran: abortos, malformaciones, mutaciones, cáncer, leucemia, y afecciones respiratorias severas entre otras. Los problemas de salud ocasionado por el uso de agroquímicos son cada vez más recurrentes (Miguez, 2005).

De acuerdo con la FAO (2017) la agricultura orgánica tiene muchas ventajas agronómicas, entre las que destacan la mayor actividad biológica, disminuye la erosión, mejora la estructura del suelo, presentan mejoras en la post cosecha, son de mayor calidad nutricional, entre otras. Sin embargo, hay que mencionar que los costos de producción de los alimentos orgánicos suelen ser más elevados porque requieren hacer mayor uso de mano de obra por unidad de producción y porque la mayor diversidad de las empresas impide hacer economías de escala; la cadena de comercialización y distribución de los productos orgánicos es en cierta forma

ineficiente y los costos son más elevados por tratarse de volúmenes relativamente pequeños.

Una de las ventajas que presenta en la actualidad la producción es el sobreprecio de los alimentos orgánicos. Se espera que en un futuro esta diferencia de precio se reduzca debido a un aumento en la producción orgánica de algunos productos, con lo que se podrá satisfacer la demanda del mercado. Por otro lado, si bien existe el riesgo de que disminuya el sobreprecio que reciben los productos orgánicos y que, en algunos casos, incluso desaparezca, los productos orgánicos certificados son bien reconocidos en la mayoría de los mercados y, como tales, pueden ser preferidos sobre los productos convencionales (FAO, 2003).

Los costos de comercialización de los productos orgánicos son más altos por la necesidad de mantenerlos apartados y de esa manera preservar su identidad orgánica. Además, la certificación y la pequeña escala de distribución contribuyen a elevar los costos. A medida que la agricultura orgánica vaya logrando una mayor participación en el mercado, las economías de escala podrán disminuir estos costos de manera significativa (Hattam, 2003).

En México la agricultura de transición está basada en la estrategia de sustitución de insumos, es decir, en la búsqueda de insumos agrícolas alternativos, menos dañinos al medioambiente, sin cuestionar ni la estructura de monocultivo ni la dependencia de insumos externos que caracteriza a los sistemas agrícolas (Roseet, 1997), lo cual no elimina por completo los problemas generados por la agricultura convencional.

En este proceso los productores al realizar únicamente la sustitución de insumos incurrir en mayores gastos e incluso algunos en el endeudamiento, ya que el uso de insumos de etiqueta verde es más costoso que los convencionales por lo tanto los cambios y beneficios son relativamente pequeños y a corto plazo, ya que no aprovecha los efectos benéficos que tiene la integración de la biodiversidad vegetal y animal (Rosset, 1997).

2.2. CONDICIONES DE TRABAJO AGRÍCOLA EN MÉXICO

Las zonas rurales se caracterizan por una demanda de trabajo con una gran dispersión, consecuentemente existen dificultades para la supervisión, se observan periodos de contratación reducidos y discontinuos, además los empleadores en su mayoría también son pobres. De igual manera, la estructura institucional del gobierno en las zonas rurales esta poco desarrollada, en consecuencia, no existe la capacidad de influir en la regulación de los mercados de trabajo (Hernández, 2007).

Los trabajadores agrícolas asalariados son aquellas personas (mujeres y hombres) que trabajan en los campos de cultivo, huertos, invernaderos, unidades ganaderas e instalaciones de procesamiento básico para producir los alimentos y fibras del mundo. Están empleados en tierras pequeñas o medianas, así como en plantaciones y explotaciones industrializadas. Son asalariados porque no poseen ni arriendan la tierra que trabajan, ni las herramientas, ni equipos que utilizan, lo que les diferencia del grupo de los agricultores. Los trabajadores no forman un grupo homogéneo y existen diferentes categorías: trabajadores agrícolas permanentes o de tiempo completo, temporales o eventuales, estacionales, migratorios, a destajos o retribución (en especie) (Hurst, 2007).

Además señala que la relación laboral crea un vínculo legal entre una persona denominada empleado y otro llamado empleador, a quien el trabajador proporciona trabajo o servicios bajo determinadas condiciones a cambio de una retribución. Sin embargo, es un hecho que los empleados agrícolas se encuentran sin protección laboral.

En México a los trabajadores agrícolas se les conoce como jornaleros y son aquellos que perciben un salario por su fuerza de trabajo, en una actividad propia del campo que está dentro de un proceso productivo. En la mayoría de los casos, el salario otorgado es por día y se denomina jornal (Gamboa y Gutiérrez, 2015). De acuerdo con Hernández (2014) las condiciones de vida de los jornaleros agrícolas en México son precarias, al igual que los términos de contratación se encuentran por debajo de lo que marca la ley.

La condición laboral de los jornaleros en México es precaria¹ pues son expuestos a largas jornadas de trabajo, los salarios son mínimos, algunos son maltratados por quienes los contratan, las horas extras no son pagadas, muchos de ellos son despedidos injustificadamente y las condiciones de higiene y seguridad son malas (Esquivel, 2015).

De acuerdo con Hernández (2014) las condiciones de vida de los jornaleros agrícolas en México son precarias, al igual que los términos de contratación se encuentran por debajo de las que marca la ley. Por ejemplo, no cuentan con afiliación a alguna institución de seguridad social, así como la insuficiencia y baja calidad de los servicios médicos en las unidades de trabajo (Gamboa y Gutiérrez, 2015). La desprotección que sufren los trabajadores agrícolas no solo los expone a un panorama que los afecta en el presente por ejemplo al sufrir alguna enfermedad que les impida laborar y por tanto obtener ingresos, sino que les afecta a largo plazo ya que no tiene derecho a incapacidad, a pensión o a seguros de invalides, situación que los hace vulnerables a la pobreza.

3. METODOLOGÍA

El estudio del costo social originado en la mano de obra florícola en la región sur del Estado de México considera como punto de partida a Nápoles (2014). En dicho estudio se establece como objetivo determinar los costos de producción del cultivo de rosa bajo invernadero mediante la obtención de los costos totales de producción en una unidad productiva modelo o de referencia. Una vez identificada la estructura contable reportada en Nápoles (2014) para registro de todas las actividades de la unidad productiva, se entrevista a un productor de cada sistema de producción (convencional, integrado y orgánico) utilizando la misma estructura contable.

En este trabajo, se retoma el número de trabajadores, su salario y el costo total de la mano de obra para determinar cuánto recibe de ingreso un trabajador florícola por día, sin prestaciones integradas y compararlo con el pago que debe recibir incluyendo prestaciones de ley, partiendo de los datos reportados por Nápoles (2014). El mismo ejercicio se realiza para la actualización de salarios a 2018, así como de lo obtenido de las entrevistas con los tres productores.

¹ Tipo de trabajo en el cual la inseguridad es un aspecto esencial que se deriva de la inestabilidad en el empleo, la falta de protección social, los bajos niveles salariales y las condiciones de vida de quienes laboran (Lara, 2008).

Para realizar esa comparación es necesario obtener las cotizaciones de prestaciones de los trabajadores florícolas, mediante la realización de tablas que contengan el salario base de cotizaciones, prima de riesgos, e Instituto del Fondo Nacional de la Vivienda para los Trabajadores (INFONAVIT), como se muestra a continuación.

Lo primero es obtener el salario base de cotizaciones (SBC), que es el salario diario con el que se registra un trabajador ante el Instituto Mexicano del Seguro Social, el cual está conformado por la suma de gratificaciones, alimentación, transporte y despensa. Una vez obtenido el SBC se le suma el factor de integración, el cual está conformado por la suma de aguinaldo, prima vacacional y los días del año (este resultado se divide entre los 365 días del año). Esto ayuda a determinar el monto de las cuotas obrero-patronales a cargo del patrón y la base para el cálculo de las prestaciones en dinero a que tiene derecho el trabajador; con la finalidad de obtener los beneficios de seguridad social que dicha institución proporciona (Montoya, 2013).

Una vez calculado el salario base de cotizaciones se procede al cálculo de la prima de riesgo del trabajador con la siguiente fórmula, obtenida de la página del IMSS (Instituto Mexicano del Seguro Social, 2003):

$$[(S/365) + V*(I+D)]*(F/N) + M$$

Dónde:

V = 28 años, duración promedio de vida activa de un individuo.

F = 2.3, factor de prima.

N = Número de trabajadores promedio expuestos al riesgo.

S = Días subsidiados por incapacidad temporal.

I = Suma incapacidades, divididas entre 100.

D = Número de defunciones.

M = 0.005, prima mínima. Al ser una actividad agrícola le corresponde la clasificación III = 2.59840.

La prima de riesgo varía según la organización. En cualquier empresa existe la probabilidad de que algún empleado pueda tener un accidente, o enfermedad a causa de la actividad que realice, es por eso por lo que no importa la actividad, el empresario o patrón siempre debe prevenir las amenazas o riesgos a los que sus empleados puedan estar expuestos.

Cabe mencionar que cuando se registra por primera vez al IMSS como patrón o cuando se cambia de actividad (art. 73 de Ley del Seguro Social), se debe de buscar en el catálogo de actividades del artículo 196 del Reglamento de la ley del IMSS, el giro de las actividades a desarrollar, la división económica, grupo económico, fracción y clase en la que encaje la actividad para que de acuerdo a eso determinemos la cuota por prima de riesgos de trabajo que corresponda (Ley del Seguro Social, 2015).

Las cuotas del riesgo de trabajo establecen que, al inscribirse por primera vez, las empresas cubrirán la prima media de la clase que conforma al reglamento correspondiente (véase tabla 1).

Tabla 1. Porcentajes fijados de las primas de riesgos de trabajo según el nivel de siniestralidad

Prima media	En porciento
Clase I	0.54355
Clase II	1.13065
Clase III	2.59840
Clase IV	4.65325
Clase V	7.58875

Fuente: Elaboración propia con base en Instituto Mexicano del Seguro Social (2007)

Posteriormente, se realiza la cotización del Instituto del Fondo Nacional de la Vivienda para los Trabajadores (INFONAVIT), el cual fue fundado el 21 de abril de 1972 con el que se da cumplimiento al derecho a la vivienda de los trabajadores establecido en la Constitución Política de los Estados Unidos Mexicanos el 5 de febrero de 1917, fecha de su promulgación. La forma consiste en reunir en un fondo nacional las aportaciones patronales del 5% del salario de cada uno de los trabajadores que tuvieron contratados, para darles la oportunidad de obtener un crédito de vivienda o el derecho a que sus ahorros les sean devueltos más el 30% de la prima vacacional y el aguinaldo, quedando la fórmula de la siguiente manera (Instituto del Fondo Nacional de la Vivienda para los Trabajadores, 2018):

$$[(\text{Salario} * \text{aguinaldo}) + (\text{Salario} * \text{prima vacacional} * 30\%) / 365 + \text{salario}].$$

Por último, una vez realizadas las cotizaciones anteriores se suman los totales del salario (factor de integración, prima de riesgo e INFONAVIT) para obtener el pago por día del trabajador florícola con prestaciones incluidas, una vez obtenido se le suma al salario que percibe el trabajador sin prestaciones y nos da el salario total, lo cual nos ayuda a hacer la comparación de ambos.

4. RESULTADOS

Se estima el salario de los trabajadores florícolas de la producción convencional con base en Nápoles (2014), del cual se obtienen los salarios sin prestaciones y con prestaciones. Los salarios se actualizaron a precios del 2018. De igual forma se presentan los salarios sin prestaciones y con prestaciones que se obtuvieron de las entrevistas realizadas en el 2018 a los productores de rosa de los diferentes sistemas de producción (convencional, integrado y orgánico).

4.1. SALARIO POR JORNADA LABORAL DE LOS TRABAJADORES FLORÍCOLAS DE PRODUCCIÓN CONVENCIONAL BASADOS EN NÁPOLES (2014)

La tabla 2 muestra los salarios por jornada laboral y el salario anual de los trabajadores florícolas del sistema de producción convencional. Nápoles (2014) reporta que el salario para la jornada laboral en el 2014 fue de \$143.75, la jornada laboral que reporta Nápoles (2014) a precios de 2018 fue de \$175.06 y para el proceso de producción convencional encuestado en el 2018 fue de \$190 pesos.

Cabe mencionar que el salario por jornada presentado por Nápoles (2014) a precios del 2018 se realizó con base al aumento porcentual del salario de los trabajadores de acuerdo con la información presentada por la Secretaría del Trabajo y Previsión Social (2018), el cual se obtuvo de la siguiente manera.

En el año 2014 el salario presenta un aumento del 3.9%, quedando en \$149.36 pesos por jornada laboral; en el 2015 presenta un aumento de 4.20%, quedando en \$155.63 pesos por jornada laboral; en 2016 presenta un aumento de 4.20%, quedando en \$162.17 por jornada laboral; en el año 2017 presenta un aumento de 3.90%, quedando en \$168.49 pesos por jornada laboral y por último en 2018 presenta un aumento de 3.90%, quedando en \$175.06 pesos por jornada laboral.

Tabla 2. Salario por jornada laboral de producciones convencionales florícolas en Villa Guerrero, Estado de México.

Proceso productivo	Número de empleados	Tiempo laborado en días	Salario por jornada laboral	Salario anual
Convencional A	27	286	\$143.75	\$ 1,110,037.50
Convencional B	27	286	\$175.06	\$ 1,351,813.32
Convencional C	21	312	\$190.00	\$ 1,244,880.00

Fuente: Elaboración propia con base en Nápoles (2014)

A: Datos obtenidos por Nápoles (2014)

B: Datos obtenidos por Nápoles (2014) con precios de 2018

C: Datos obtenidos en campo (productor convencional)

La tabla 3 muestra los salarios por jornada laboral y el salario anual de los trabajadores florícolas con prestaciones incluidas. De la producción convencional, Nápoles (2014) reporta el salario para la jornada laboral en el 2014 sin prestaciones fue de \$143.75. Después de calcular las prestaciones de ley correspondientes se obtiene un salario para la jornada laboral de \$154.89 pesos. Para la jornada laboral que reporta Nápoles (2014) a precios de 2018, la jornada laboral sin prestaciones es de \$175.06, al calcularse las prestaciones de ley la jornada laboral es de \$187.84 pesos. Por último, para la producción convencional de la encuesta en 2018, se tiene que el salario por jornada laboral sin prestaciones de \$190.00 pesos, y con cotizaciones un salario por jornada de \$203.55 pesos.

Una vez obtenido el costo de mano de obra sin prestaciones y con prestaciones, se elabora la tabla 4, que es el resumen de la información obtenida en las tablas 1 y 2, se hace la comparación entre los salarios por jornada laboral con prestaciones y sin prestaciones.

La comparación entre el pago sin prestaciones que reciben los trabajadores florícolas de \$143.75 pesos y el pago con prestaciones incluidas de \$154.89 pesos, de la producción convencional reportado por Nápoles (2014) presenta una diferencia de 7%. La comparación entre el pago que reciben los trabajadores florícolas de \$ 175.06 pesos y el pago con prestaciones incluidas de \$187.84 de la producción convencional Nápoles (2014) a precios de 2018 presenta una

diferencia del 7% La comparación entre el pago que reciben los trabajadores florícolas de \$ 190.00 pesos y el pago con prestaciones incluidas de \$ 203.55 pesos de la producción convencional del 2018 presenta una diferencia del 7%.

Tabla 3. Salario por jornada laboral de producciones convencionales de la mano de obra florícola en Villa Guerrero, Estado de México con prestaciones incluidas.

Salario del empleado florícola con prestaciones	Convencional A	Convencional B	Convencional C
	2014	2018	2018
Salario por jornada laborada	\$143.75	\$175.06	\$ 190.00
Salario base de cotizaciones	\$143.75	\$175.06	\$190.00
Factor de integración	1.05	1.05	1.05
Prima de riesgo	2.60	2.60	2.60
INFONAVIT 5%	7.49	9.12	9.90
Salario por día con prestaciones	\$154.89	\$187.84	\$203.55
Salarios totales anuales con prestaciones	\$ 1,333,659.60	\$ 1,761,254.40	\$1,946,697.00

Fuente: Elaboración propia con base en Nápoles (2014)

A: Datos obtenidos por Nápoles (2014)

B: Datos obtenidos por Nápoles (2014) con precios de 2018

C: Datos obtenidos al encuestar productor convencional

Tabla 4. Tabla comparativa de salarios por jornada laboral con y sin prestaciones a empleados florícolas en Villa Guerrero, Estado de México para la producción convencional.

Proceso productivo	Número de empleados	Salario por jornada laborada sin prestaciones	Salarios totales anuales	Número de empleados	Salario por jornada laborada con prestaciones	Salarios totales anuales
Convencional A	27	\$ 143.75	\$1,110,037.50	27	\$ 154.89	\$ 1,333,659.60
Convencional B	27	\$ 175.06	\$1,351,813.32	27	\$ 187.84	\$ 1,761,254.40
Convencional C	27	\$ 190	\$1,244,880.00	27	\$ 203.55	\$ 1,946,697.00

Fuente: Elaboración propia con base en Nápoles (2014)

A: Datos obtenidos por Nápoles (2014)

B: Datos obtenidos por Nápoles (2014) con precios de 2018

C: Datos obtenidos en campo (productor convencional)

4.2. SALARIO POR JORNADA LABORAL DE LOS TRABAJADORES FLORÍCOLAS DE LOS PROCESOS DE PRODUCCIÓN CONVENCIONAL, INTEGRADA Y ORGÁNICA

La tabla 5 muestra los salarios por jornada laboral y el salario anual de los trabajadores florícolas de producción convencional, integrada y orgánica, sin prestaciones. El salario para la jornada laboral en la producción convencional fue de \$190.00 pesos, mientras que para la producción orgánica fue de \$171.50 pesos y para el proceso integrado es de \$230.00 pesos.

Tabla 5. Salario por jornada laboral de producción convencional, integrada y orgánica de la mano de obra florícola en Villa Guerrero, Estado de México sin prestaciones.

Proceso productivo	Número de empleados	Tiempo laborado en días	Salario por jornada laborada	Salarios totales anuales
Convencional	21	312	\$ 190.00	\$ 1,244,880.00
Orgánico	30	323	\$ 171.50	\$ 1,690,905.00
Integrado	25	317	\$ 230.00	\$ 1,822,750.00

Fuente: Elaboración propia

La tabla 6 muestra los salarios por jornada laboral y el salario total anual de los trabajadores florícolas con prestaciones incluidas de la producción convencional, orgánica integrada. La convencional muestra un salario para la jornada laboral de \$203.55 pesos, mientras que para la orgánica el costo de la jornada laboral es de \$184.09 pesos y para el integrado es de \$ 245.64 pesos.

Tabla 6. Salario por jornada laboral de producciones convencional, integrada y orgánica florícola en Villa Guerrero, Estado de México con prestaciones.

Salario del empleado florícola	Convencional	Orgánico	Integrado
	2018	2018	2018
Número de empleados	21	30	25
Tiempo laborado en días	312	323	317
Salario por jornada laborada	\$190.00	\$171.50	\$230.00
Salario base de cotizaciones	\$190.00	\$171.50	\$230.00
Factor de integración	1.05	1.05	1.05
Prima de riesgo	2.6	2.6	2.6
INFONAVIT 5%	9.90	8.94	11.98
Salario por día	\$203.55	\$184.09	\$245.64
Salarios totales anuales	\$ 1,333,659.60	\$1,761,254.40	\$ 1,946,697.00

Fuente: Elaboración propia

Una vez obtenido el costo de mano de obra sin prestaciones y con prestaciones de los procesos de producción convencional, orgánico e integrado, se calcula la tabla 7, que resume la información obtenida en las tablas 4 y 5. La información resultante permite comparar los costos de los salarios con y sin prestaciones, así se obtiene el porcentaje del costo social generado para un año (2018).

La tabla 7 muestra que la producción orgánica paga un salario más bajo por jornada con prestaciones (\$181.76 pesos) que el integrado (\$245.64 pesos) y el convencional (\$203.55 pesos). La comparación entre el pago sin prestaciones que reciben los trabajadores florícolas en la producción convencional es de \$190 pesos y el pago con prestaciones incluidas de \$203.55 pesos, representando una diferencia del 7% entre los salarios con prestaciones y sin prestaciones.

Tabla 7. Tabla comparativa de pago con y sin prestaciones a empleados en producciones florícolas en Villa Guerrero, Estado de México.

Proceso productivo	Número de empleados	Salario por jornada laborada sin prestaciones	Salarios totales anuales	Número de empleados	Salario por jornada laborada con prestaciones	Salarios totales anuales
Convencional	21	\$ 190.00	\$1,244,880.00	21	\$ 203.55	\$ 1,333,659.60
Orgánico	30	\$ 171.50	\$1,690,905.00	30	\$ 181.76	\$ 1,761,254.40
Integrado	25	\$ 230.00	\$1,822,750.00	25	\$ 245.64	\$ 1,946,697.00

Fuente: Elaboración propia

La comparación entre el pago que reciben los trabajadores florícolas en la producción orgánica es de \$ 171.50 pesos y el pago con prestaciones incluidas es de \$181.76 y representa una diferencia del 5%. La comparación entre el pago que reciben los trabajadores florícolas para la producción integrada es de \$230 pesos y el pago con prestaciones incluidas de \$245.64 pesos de la producción integrado y representa una diferencia del 7%.

Los porcentajes de diferencia en cada proceso de producción representa el costo social, por tanto, la pérdida de bienestar de los trabajadores de estas unidades productivas. De las tres formas de producción, la de menor costo social está en la producción orgánica, aunque esta paga un salario más bajo.

5. CONCLUSIONES

La actividad florícola es un motor económico importante en el sur del Estado de México y una fuente importante de empleos, pero como en su mayoría los empleos agrícolas éstos son precarios. Estos empleos se caracterizan por contrataciones sin las prestaciones establecidas por ley y con bajas condiciones de seguridad. El no asumir el costo social (pérdida de bienestar) generado por la actividad florícola no solo repercute en quien la realiza, sino que también en la población en general, pues estos costos los absorben terceros, los cuales no están realizando dicha actividad, por lo tanto, el floricultor hace caso omiso ante tal situación.

A pesar de que la zona florícola a lo largo de los años ha presentado un crecimiento, se observa que el nivel de vida de los pobladores mejora con lentitud, ello en parte se debe a esta precariedad en los salarios agrícolas que ha caracterizado a estos empleos. Los salarios generan beneficios importantes al empleador, ya que no contienen entre un 5% y 7% de los costos de la mano de obra, dando como resultados precios bajos que son competitivos de los productos florícolas en el mercado y generando al mismo tiempo un costo social.

Este precio habría de aumentar en proporción al costo social que está generando la actividad; para el caso de la unidad productiva presentada en esta investigación las prestaciones sociales del trabajador equivaldrían a un aumento del 5 al 7%, dependiendo del sistema de producción que se utilice. De esta forma el consumidor deberá estar dispuesto a pagar el precio con porcentaje adicional por el producto que va a adquirir y así solventar la pérdida de bienestar.

Al no absorber el costo social, las unidades productivas generan que los trabajadores agrícolas sean vulnerables, por tanto, al empobrecimiento.

REFERENCIAS

BAUTISTA, R. O. (2006). La floricultura mexicana, el gigante que está despertando. *Claridades agropecuarias*, 60.

BLANCO, A. y DÍAZ, D. (2005). El bienestar social: su concepto y medición. *Psicothema*, 17(4), 582-589.

ESQUIVEL, E. (02 de abril de 2015). Jornaleros agrícolas: Pobres y explotados como esclavos. *SDPnoticias.com*. Recuperado el 16 de abril de 2018, de <https://www.sdpnoticias.com/nacional/2015/04/02/jornaleros-agricolas-pobres-y-explotados-como-esclavos>

FAO (2003). *¿Qué es la agricultura orgánica?obtenido de: <http://www.fao.org/docrep/007/ad818s/ad818s03.htm> [Accessed 13 Jun. 2017]*

FAO (2017). *Organización de las Naciones Unidas para la Alimentación y la Agricultura* . Obtenido de <http://www.fao.org/organicag/oa-faq/oa-faq6/es/>

GAMBOA, M. C., y GUTIÉRREZ, S. M. (2015). *Jornaleros agrícolas en México. Antecedentes, políticas públicas, tratados internacionales, causas y efectos del problema, iniciativas y opiniones especializadas*. México: Camara de Diputados y Dirección General de Servicios de Documentación y Análisis.

HATTAM, N. E. (2003). *Agricultura orgánica, ambiente y seguridad alimentaria*. Roma.

HERNÁNDEZ, T. J. M. (2007). Caso de México. En Soto, B. F. y Klein, E. *Políticas de mercado de trabajo y pobreza rural en América Latina tomo II* (203 - 245). México: FAO y CEPAL.

HERNÁNDEZ, T. J. M. (2014). Condiciones de trabajo e ingreso en la agricultura intensiva mexicana. *Análisis económico*. XXIX (71), 137-160

HURST, P. (2007). *Trabajadores agrícolas y su contribución a la agricultura y el desarrollo rural sostenibles*. Ginebra, Suiza. Oficina Internacional del Trabajo.

INSTITUTO MEXICANO DEL SEGURO SOCIAL, Diario Oficial de la Federación. Formato de determinación de la prima del seguro de riesgos de trabajo derivada de la revisión anual de siniestralidad CLEM-22 CLEM- 22A, 28 de febrero de 2003.

LARA, F. S. M. (2008). ¿Es posible hablar de un trabajo decente en la agricultura moderno-empresarial en México?. *El Cotidiano*, 23 (147), 25-33.

LEY DEL SEGURO SOCIAL, Diario Oficial de la Federación. Nueva ley publicada en el Diario Oficial de la Federación, 12 de noviembre de 2015.

- MEJÍA, M. (20 de abril de 2017). Floricultura mexicana, con potencial de exportación. México: *Vértigo Político*. Recuperado de <http://www.vertigopolitico.com/articulo/46255/Floricultura-mexicana-con-potencial-de-exportacion-III>
- MIGUEZ, S. V. (2005). *EcoPortal.Net*. Recuperado el 02 de mayo de 2017, de http://www.ecoportall.net/Eco-Noticias/Los_efectos_de_los_agroquimicos_y_otros_contaminantes_antes_en_la_salud
- MONTOYA, T. R. (2015). *Impacto en el costo de la mano de obra por trabajo en tiempo extraordinario en la construcción* (tesis de maestría). Universidad Nacional Autónoma de México, Distrito Federal, México.
- MOYA, J. R. (1994). La agricultura sostenible como alternativa a la agricultura convencional: conceptos y principales métodos y sistemas. *ERIA*, 161-173.
- MUÑOZ, L. (24 de noviembre de 2014). *AgroHuerto*. Recuperado el 20 de mayo de 2017, de <https://www.agrohuerto.com/la-produccion-integrada/>
- NÁPOLES, T. M. (2014). *Determinación de costos de producción y análisis de costos del uso del fertilizante FosfiMAX® 40-20 en el cultivo de rosa en invernadero* (tesis de licenciatura). Universidad Autónoma del Estado de México, Tenancingo, México.
- NICHOLS, M. Á. (2007). *Conversión agroecológica de sistemas convencionales de producción: teoría, estrategias y evaluación*. Asociación Española de Ecología Terrestre: Asociación Española de Ecología Terrestre.
- ORTEGA, G. (2009). Agroecología vs. Agricultura Convencional. *Base Investigaciones Sociales*, 24.
- PÁEZ, S. O. (2008). Informe sobre la floricultura colombiana. Condiciones laborales y la crisis del sector.
- PromueveHidroponia. (1 de agosto de 2014). *Hidroponia.mx*. Obtenido de <http://hidroponia.mx/la-floricultura-en-mexico-un-desarrollo-potencial-para-la-economia/>
- RAMÍREZ, H. J. J., AVITIA, R. J. A., y TORRES, O. F. (2015). Desarrollo en el sur del Estado de México ¿la floricultura como alternativa a la situación del sector agropecuario?, *Explanans*, 4(1), 33-58.
- ROSSET, P. (1998). La crisis de la Agricultura Convencional, la Sustitucion de Insumos, y el Enfoque Agroecologico. Oakland, California, 94618, EUA: Institute for Food and Development Policy (Food First), pp.1-17.
- SIERRA, C. (23 de junio de 2016). Agricultura convencional, integrada y orgánica: ¿cómo lograr una actividad más sustentable? *El Mercurio*.
- Tecnologías Agrarias. (2013). Catálogo de productos. Agricultura a campo abierto. *Tecnologías agrarias*, 25. Obtenido de <https://es.slideshare.net/tecnologiasagrarias/agricultura-intensiva>

ANALYSIS OF THE EFFECTS OF THE MODULAR DESIGN MODEL OF CAR PRODUCTION ON WORKING CONDITIONS: THE CASES OF VW NAVARRA AND PSA VIGO

PABLO LOPEZ CALLE

Departamento de Sociología III/Facultad de Ciencias Política y sociología/Universidad Complutense de Madrid
Campus de Somosaguas-28223. Madrid/plopezca@cps.ucm.es

MARIO RÍSQUEZ RAMOS

Instituto Complutense de Estudios Internacionales/Universidad Complutense de Madrid. Finca Mas Ferré, Edificio A
Campus de Somosaguas, entrada 3, 28223 Pozuelo de Alarcón (Madrid)/mrisquez@ucm.es

MARIA EUGENIA RUIZ-GÁLVEZ

Departamento de Economía de la Empresa (ADO), Economía Aplicada II y Fundamentos de Análisis Económico/Universidad Rey Juan
Carlos/Calle Tulipán s/n. 28933 - Móstoles – Madrid/maria.ruizgalvez@urjc.es

e-mail Mario Rísquez: mrisquez@ucm.es

Resumen

A raíz de la implantación de los nuevos modelos de organización productiva basados en el diseño modular en esta investigación estudiamos los efectos que se derivan sobre las condiciones laborales en el sector automotriz. Para ello analizaremos los modelos productivos y sus efectos sobre las condiciones laborales en el sector del automóvil en España. De forma más específica nos centramos en dos de las plantas del sector más importantes en España, PSA Vigo y VW Navarra, donde se han aplicado estos nuevos sistemas de ensamblaje sobre plataformas modulares.

Para ello, planteamos una propuesta de análisis que nos permite abordar la complejidad de este nuevo modelo productivo, combinando variables –estrategia de rentabilidad, especialización productiva y organización técnica y social- con dimensiones –intra grupo, intra empresa e inter firmas-, a través de una comparativa entre dos estudios de caso. Una propuesta útil y funcional para analizar los aspectos organizativos y productivos intrínsecos de estos procesos de fabricación, profundizando en las condiciones laborales de los trabajadores, así como en los factores que las determinan.

Palabras clave: modelo productivo, sector automotriz, condiciones laborales, salarios.

Códigos JEL: L23, L62, J81, J31.

Área o eje Temático 1: Economía Internacional

Abstract

Following the implementation of new systems of automobile manufacturing based on modular design, we undertook the study of changes in the working conditions of this sector. We elected to further explore these models of productive organization and their effects on working conditions in the automotive sector in Spain. Specifically, we focused on two of the most important plants in the Spanish automotive sector, PSA Vigo and VW Navarra, where new assembly systems have been applied on modular platforms.

In our research, we adopted an analytical approach that would allow us to address the complexity of this new production model, combining variables (profitability strategy, productive specialization, technical and social organization) and dimensions (within the Group, intra-company, inter-firm) through comparison of the two case studies. Our analysis represents a useful, functional way of studying the intrinsic organizational and productive aspects of current manufacturing processes, reflected in the working conditions of the workers and in the factors that determine them.

Key Words: production model, automotive sector, labor conditions, salaries.

JEL codes: L23, L62, J81, J31.

Thematic Area 1: International economics

1. INTRODUCTION

For the past 100 years, the automotive sector has been a laboratory for transformations in production models, and the evolution of productive organization has had direct implications for labor relations. The main objective of this research is to discover those factors that affect and determine labor relations, both within the parent companies and in their productive environments, as related to the various strategies for business profitability. Conducting such an analysis through the disciplines of economics and sociology seems especially pertinent, placing the perspective of workers at the center of economic analysis and bringing production to the social level, thus giving prominence to relationships between the social agents involved. In this research, we seek to analyze the links between models of productive organization and working conditions in two of the most important automotive plants in Europe: PSA Vigo and VW Navarra.

To develop our proposed analysis, we have opted for a comparative case-study methodology that allows us to identify the specific elements that characterize both manufacturing processes, as well as to identify distinctions and elements in common. We began by delimiting the analysis to a branch of special interest: the automotive industry. In Spain, the manufacture of vehicles and auxiliary parts and components is strategic to the overall industrial plan. Participation by this sector represents around 8.6% of GDP, and more than 19% of total exports, also generating some 9% of employment in Spain's economy. To further deepen the analysis, we elected to shape the research by delimiting not only by sector, but also by autonomous region. To this end we chose two assembly plants, PSA Vigo and VW Navarra, each sustaining great economic and social weight in their regions and in the sector, and representing 14.6% and 12.26% of national automotive production, respectively. The time dimension of our analysis includes the period 2005 to 2017 – sufficiently broad to capture changes that occurred from before the 2008 economic crisis and into the current period.

Over the course of this study, we have developed various types of research activities. Firstly, we carried out an exploratory phase at the sectorial and territorial levels, reviewing not only different sources – literature and related works, news, audited reports, trade union bulletins – but also analyzing the technical and territorial specificities of the overall process (phases, materials, parts...).

Once this first stage was finalized, we made six visits (of 4 to 7 days each) to PSA Vigo, VW Navarra, and seven companies from the supplier park. Across the various union organizations, we conducted more than 30 interviews with workers, union delegates, and management personnel from the different companies. All the interviews were built around specific questionnaires addressed to the workers and management of both VW and PSA, as well as to the suppliers. The interviews and questionnaires were structured into four main blocks: general data, the production process, the work organization model, and collective bargaining; these were adapted to each specific case depending on the profile of the company.

Also, thanks to data provided by the stakeholders interviewed, we have been able to access information on the workers from the different companies and to perform fieldwork in the factories to observe and/or processes directly. This more qualitative approach has been combined with the analysis of macroeconomic and microenterprise data, use of the ORBIS database, and reviews of reports, agreements, and audit results from each supplier company.

Because our general objective is to analyze the factors that affect and determine the labor relations of the workers involved, we begin from the hypothesis that, in a context of increasing homogenization of organizational, productive, and technical capacities in the automotive sector, working conditions have become the main component for adjustment in terms of competitiveness, especially in the wake of the recent economic crisis.

This article is divided into three main sections. In section 2, we analyze the profitability strategies and the modularization of the production process. Once the essential characteristics of these production processes have been identified, we turn in section 3 to the working conditions; that is, those aspects of labor that affect the economic, physical, and psychological conditions of workers. The third main focus of the article (section 4) examines the effects of adjustment on labor productivity in both cases (PSA and VW). Finally, we close the investigation with our conclusions, seeking to highlight elements common to both cases as well as the main differences between them.

2. BUSINESS STRATEGIES AND MODULARIZATION OF THE PRODUCTION PROCESS

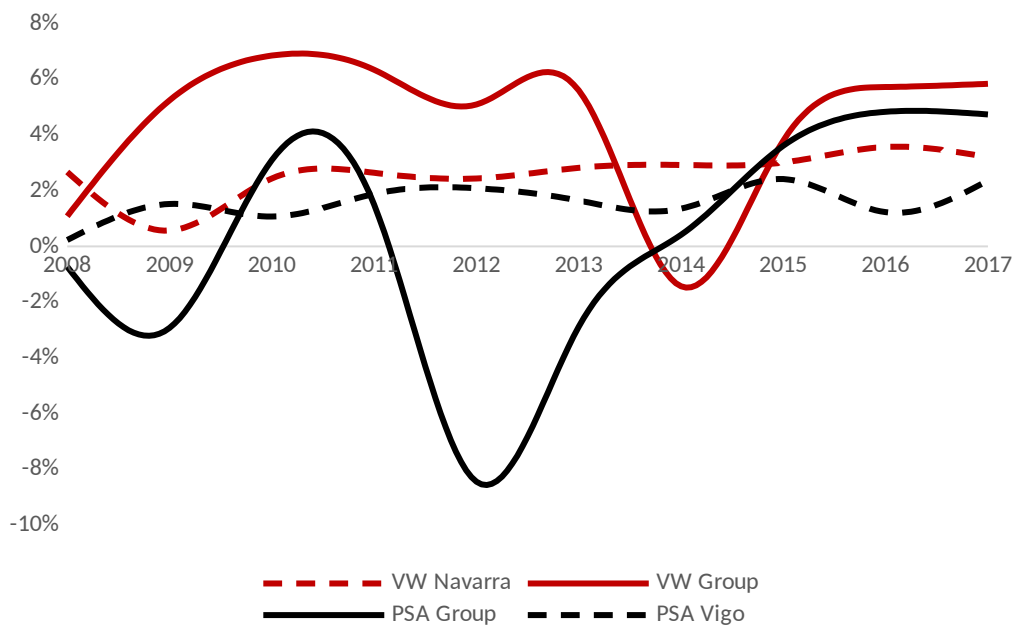
2.1. PROFITABILITY AND BUSINESS STRATEGIES IN THE CONTEXT OF THE ECONOMIC CRISIS

With the outbreak of the financial and economic crisis, the profitability strategies of the large automotive groups were affected in the context of recession and market uncertainty. However, the heterogeneity of the plants, specialized into different production segments within each automotive group, reveals the multiple effects of the slowdown and the decrease in global demand on sales and production within the sector.

In the case of the VW Group, we note that during the early years of crisis, the group continued to grow in both production and profitability, and that the effects of the global crisis began to be felt in 2012. Based on the data obtained, we observe a positive evolution of profitability at VW Navarra from the beginning of the crisis and through the launch of the Polo A05 model, with the factory's profits increasing throughout the crisis period.

With regard to PSA, during the early years of the global economic crisis the group presented a situation of relative vulnerability, reflected in negative rates of return that turned critical in 2012-2013. The PSA Vigo factory, however, managed to maintain positive rates of profitability throughout the economic crisis period, despite a reduction in its production levels seen mostly in the early years.

Graph 1. Operating profit margin in VW and PSA, 2005-2017



Source: authors' elaboration based on ORBIS database

The behavior of VW in Navarra and especially of PSA in Vigo during the economic crisis improved the results of both automotive groups. This was due in part to the fact that the general contraction in demand in both Spain and Europe as a whole did not profoundly affect demand for medium-range vehicles, in which both manufacturing plants are specialized. Significant demand for models of this category absorbed part of the declining demand for cars of higher quality and larger size in European markets. Indeed, sales grew, especially in the intra-community zone, which remains the main selling destination for both manufacturing plants.

Despite the good economic performance of these Spanish plants in the context of crisis, the broader downturn in the profitability of both automotive groups had as a consequence the implementation of new strategies based on the permanent reduction of costs, with cost-restructuring measures put into effect at all the manufacturing plants of both groups. Thus at PSA Vigo, successive strategic plans developed during the crisis focused particular attention on changes that included a strong reduction in labor costs. A similar path was followed at VW Navarra, which was the first plant to promote MQB Modular Platforms as a principle and permanent cost-adjustment tool.

This strategy of profitability based on the permanent reduction of costs served the aim of restoring deteriorated short-term margins of profitability at both groups, emphasized by another context in which the homogenization of organizational and technical dimensions relegated plants in the sector to a secondary role in terms of short-term competitiveness. This aspect will be pursued in greater depth in the following section.

2.2. MODULARIZATION OF THE PRODUCTION PROCESS AND ITS EFFECTS ON COMPETITION

The effects of development of a given productive model, which is to say the technical organization of production, imply that limitations may arise in the medium-term operation of said model, favoring new forms of industrial inter-business organization. The concept of "lean production" (characteristic of the Japanese automotive industry model) refers specifically to a method of organization based on adjusting production to demand, both final and intermediate, involving the different companies that form part of a production chain as

well as the various nuclei of activity within a single company. In short, this is a method that aims to reduce stocks and production costs alike (Coriat, 1993; Womack et al., 1991).

This strategy of cost-plus profitability based on economies of scale (i.e., permanent reduction of production costs by distributing fixed costs across the largest possible volume) proved limited, slowed by its own goal of offering a specific product to each client at the time demanded (Boyer and Freyssenet, 2003). This method of organizing work and production also clashed with the need to meet growing demand for market quality, and the need to supply diversified intermediate products in very short delivery times, ultimately resulting in “*flux tendu*” among companies and variants of just-in-time production methods (Durand, 2009).

In the context of local work environments, comprising the phases embedded in global value chains, hierarchical structures were established among companies whose market outlets were channeled through the company in charge, transferring market pressures down to the production costs of each auxiliary firm. This also implied the need for reliability and stability among network supplier contracts, which acted as a barrier to entry for new manufacturers of components and thus produced a certain distribution of bargaining power among the different actors.

This also ultimately implied that the competitiveness of each center would depend on the competitiveness of the whole, making it difficult to individualize or isolate the pressure on any particular provider.

In this way, the progressive development of production models based on lean manufacturing, and on just-in-time supply and assembly systems, generated their own conditions for transformation: the transition from mass production systems to the Japanese model was achieved through cascading externalization of the manufacture of parts for the same types of vehicle; but the conception of the vehicle itself remained based on ‘integral architecture’ – design oriented to assembly – allowing cars to be manufactured from the inside out. (Takeishi and Fujimoto, 2001; Fujimoto, 2007).

Little by little, such small modifications in automotive manufacturing supposed a qualitative change of model. Manufacturers became detached from the assembly of increasingly larger sub-assemblies – literally outsourcing whole segments of their assembly lines. This made them more and more agile in view of short-time manufacture in order to serve the quantity and tastes of demand, while an increasingly significant portion of the final product was executed through more or less standardized modular sub-assemblies.

These sub-sets were then integrated into different vehicles. For example, at the beginning of the year 2000, the Volkswagen Group manufactured all models of all its brands on four distinct platforms; eventually it changed to a new conception based on modular architecture, itself based on assembly-oriented design (Design for Assembly, or DFA) (Tasalloti et al., 2016; Bogue, 2012). That transformation solved some of the aforementioned problems of lean manufacturing: it took advantage of the cost reductions implied by the standardization and simplification of tasks, without losing the competitiveness derived from the adaptation of a product to consumer tastes – i.e., “simplification and reduction of costs in engineering processes, design, and development; flexibility of production; and the search for economies of scale on a global level (greater purchasing power)” (Lampón and Cabanelas, 2014: 18).

Later, the VW and PSA Groups moved from a system of standardized platforms to modular platforms that can adapt to various models by way of a single, scalable design, thus facilitating changes in structural dimensions (such as front and rear overhang, track width, or wheelbase). This allows for not only assembly of a variety of models within a single segment (same basic size), but also assembly of models from different segments (different sizes) on the same platform.

To the extent that modular design yields the possibility of manufacturing different models of customizable vehicles (“mass customization”) through the assembly of standardized modules (front-end, cockpit, engine, chassis...), some of the advantages of economies of scale are thereby combined with the advantages of economies of scope. This has allowed models from the same segment (such as the Volkswagen Golf and Beetle and the Seat León) to share identical components at a rate of more than 60% (Lampón and Cabanelas, 2014: 15).

Regarding the governance of intra-chain relations in the case of the automobile, the strategy is set at group level and then developed specifically within each assembly plant, in factories whose output is the ‘final good’ (here, the assembly and final preparation of the vehicle). This strategy emanating from group level is transferred down to the set of suppliers that comprise the chain, given that the hierarchy of power is topped by the assembler, which is the main source of demand for suppliers. (Fine, 1998; Mc Alinden et al. 1999; Sturgeon and Florida, 2000).

In the case of VW and its specific strategy affecting the Landaben plant in Navarra (Spain), the new MBQ platform (replacing three prior platforms – PQ25 (B), PQ35 (C), and PQ46 (D)) will be used to manufacture 24 different models from 14 manufacturing plants in Europe alone, with a global productive capacity of 3,910,000 vehicles annually. According to the VW Group’s calculations, this will multiply by five the volume of orders to any single supplier and reduce by 20% the costs of purchasing components.

In the case of PSA, in 2013 a platform known as EMP2 (Efficient Modular Platform) was launched at Vigo (Spain) and at Sochaux (France), with the goal of expanding implementation to four more of the Group’s

European plants. This new modular platform allows assembly of no less than 50% of all of the manufacturer's vehicles (Lampón and Cabanelas, 2014: 22-23).

Thus there has developed a tendency toward eventual homogenization of the organizational and technical capacities available to manufacturers in the automotive sector.

On the one hand, as regards the architecture of the production process, many (and especially European) manufacturers have since the mid-1990s developed and adapted modularization within their production processes (Fujimoto and Takehisi, 2001). At the same time, they have adopted systems of organization based on the just-in-time system. Implementation of these models of organization of production by (chiefly) European and American companies has now reached a certain level of maturity and no longer represents a source of differential competitive advantage among manufacturers.

On the other hand, the installation of a new generation of modular platforms (and the implications in terms of homogenization and standardization of technical capabilities at the assembly plants) likewise causes this competitiveness factor to play a less decisive role.

Meanwhile, the context of economic crisis has driven business groups of the automotive sector (specifically VW and PSA) to develop strategies with the aim of restoring levels of production and profitability damaged by the contraction of international demand. Working conditions, as an adjustable factor in the short term, offering fairly immediate results, have been established as the main component through which to influence strategies of profitability and competitiveness.

Also, given the framework of greater competition among plants of the same group, as a result of the greater standardization of technical capabilities, the main instrument of pressure by these groups for the adjustment of working conditions has been the launching of new models. The chief rationale for the awarding of new models to plants within a group has been based on an aggressive criterion of profitability, thus putting working conditions at the center of the adjustment focus.

3. WORKING CONDITIONS AS AN ADJUSTMENT VARIABLE

As noted, in the context of economic crisis and the contraction of demand, the business strategies developed by both automotive groups have focused on the adjustment of working conditions, and this variable has taken on special relevance as a competitive advantage, in two senses. First, it offers a source of competitive advantage between distinct manufacturers, and second, it is a component through which to influence the competition among plants of the same group in the awarding of new models, always with the aim of extracting short-term profitability at the group level. The pattern of adjustment in working conditions at both VW and PSA plants has been supported by elements shared in common, although the degrees of intensity have been different. For purposes of clarity, we have grouped these adjustments into four categories: employment, flexibility, salaries, and intensity of work.

3.1. EMPLOYMENT

Since the beginning of the economic crisis, the level of employment has fallen drastically at the PSA Vigo factory, currently employing around 6,300 workers, compared to 9,907 in 2007. At the VW Navarra factory, jobs were continually lost from the year 2000 (more than 5,300 workers) until 2007 (3,900 workers). However, following an increase in production in 2010 and 2011, that number has since risen to a current total of 4,700 employees.

One element common to both cases has been changes to the contractual composition of the staff, with increases in part-time and temporary work; adaptation of the workforce through external flexibility mechanisms has affected between 10% and 12% of the staff at VW Navarra. In years with the highest volume of production (2009 and 2010), the proportion of temporary workers has been as high as 22%, further strengthening the strategy of labor flexibility. In the case of PSA Vigo, temporary employment has likewise increased in recent years, reaching one-third of the workforce in 2018, and part-time work has doubled since the beginning of the crisis, reaching 75%. This contractual heterogeneity facilitates the productive reorganization of staff in the face of oscillating demand in order to assume the lowest possible costs.

Similarly, the issuance of Employment Regulation Files (EREs), whether for suspension or termination, has become a common policy for both groups in order to adapt production volume to demand at all times, especially at Vigo. In the case of PSA, six waves of ERE implementation have been implemented from 2011 to present, most of them temporary but affecting the workforce continuously throughout the period. In the case of VW Navarra, only one temporary ERE has been implemented, motivated by the engine-supply problem following the diesel-emissions scandal suffered by the German group. However, while this practice has not been common at VW Navarra, many supplier companies within the industrial park have in recent years been affected by EREs (whether total or partial), as well as by suspensions and reductions of workdays, despite the growth in production volume over the same period.

Across the entire supply chains of both factories the pattern of adjustment in levels of employment has been similar, while the drag-effect of the assembly factories on production by suppliers has been strong. Likewise, in the context of the just-in-time supply system and fluctuations in demand, carried along the chain, adjustment of the workforce has been articulated through EREs and through part-time and temporary contracts, all of which have increased significantly in the supplier sector.

3.2. FLEXIBILITY

One aspect most affected has been flexibility in the organization of work. In recent years a battery of measures to enhance flexibility have been deployed to harmonize the organization of work with the needs of production through flexible management of the workforce. Two of the main mechanisms implemented in the two cases under study have been related to the promotion of irregular working hours and the variability of the work calendar.

These measures allow the introduction of changes to the distribution of the workforce throughout the workday via mechanisms of 'prior notice'. These changes can arise in the very short term – even during a single working day, which management may expand in accord with production needs. In addition, the irregular distribution of working hours increasingly affects a larger percentage of the workforce.

Moreover, the variability of work schedules allows management to schedule changes to the annual calendar of working days, based on production needs. Such changes can be motivated, for example, by changes in market forecasts, thereby facilitating the adjustment of the productive plan to fluctuations in anticipated demand.

Continued use of the ERE instrument has proved functional to the flexible adjustment of organizational structures to productive needs throughout the period. At both PSA Vigo and VW Navarra, an additional 'bag of hours' mechanism permits the adjustment of working hours of each employee, causing them to work more days, or more hours in a given day, whenever the workload demands it; this is compensated by fewer working hours when the opposite situation occurs. In short, these mechanisms in combination with the changes to the employment structures indicated above have given management of the labor force much more flexibility, thus incurring lower costs.

It is essential to point out that the adoption of these flexibility mechanisms in a general way across the entire workforce has been made possible by regulatory changes that have taken place in the Spanish labor market since the beginning of the crisis, mainly between 2009 and 2012, articulating a much more flexible labor framework.

3.3. SALARIES

Salary costs at the assembly factories of PSA Vigo and VW Navarra, as well as in the groups of suppliers supplying both plants, constitute a main component by which to influence the adjustment strategy. During the period of economic crisis, and specifically from 2014, a process of moderation has been developed – including wage devaluation in some cases – conditioned by the strategies of both business groups. Salary adjustments have been consolidated in two ways: by untying wage increases from factors of productivity and inflation, and through changes in salary structures for the various professional categories.

Both at PSA Vigo and VW Navarra and in their productive environments, during the early years of the economic crisis the rate of annual salary increases was strongly reduced, compared to the pre-crisis period. Essentially from 2014, growth of salaries has been disconnected from productivity, reflecting continued growth in both cases, as well as from growth of inflation. This policy of wage moderation and devaluation is confirmed in the different collective agreements negotiated at both plants during this period. The bulk of the salary adjustment at VW Navarra was negotiated in the agreement covering the years 2013 to 2017, and at PSA Vigo in two agreements finalized in 2012 and 2016. In the case of Navarra, both the assembly plant and its suppliers experienced a turning-point in 2011: wages have gone from annual increases of between 3% and 5% to stagnation, or even salary losses.

Adjustment has been similarly consolidated through the modification or elimination of several remuneration supplements. In the case of PSA Vigo, supplements such as that for consistent presence (representing €498.73 per year for production operators) were eliminated, while others such as working weekends or habilitation programs were reduced, affecting staff who remain 'in training' for a certain period. A very similar situation has unfolded at VW, and even more profoundly in the supplier companies – especially those engaged in more labor-intensive practices – which have seen significant decreases in both base and variable salaries.

The adjustment of salary costs has been further assisted by the introduction of new professional categories for entry, faced by new personnel and associated with substantially lower remuneration levels. This has been the case at both assembly plants and has become a common policy also affecting the suppliers that make up the chain, mediated by pressures exerted by the group and by sectorial strategies promoted by employers' association in each territory.

3.4. INTENSITY OF WORK

In both production chains there has been a huge increase in the intensity and pace of work. Also, in a context of an increased work pace and fewer employees, it should be noted that the workload has become unbalanced. Different vehicle models circulate through the same assembly line, requiring greater or lesser attention, and there is no logic to the sequence of vehicles entering the line, leading to bottlenecks and periods of higher work intensity.

In the context of the just-in-time supply method, the intensification of work rhythms and the increase in production shifts at both factories imply that suppliers must adapt and operate according to the productive needs of the plant, despite a reduced capacity to manage labor flexibly. In this sense, the intensity of work has become in recent years a main source of conflict, not only within both factories but in the overall automotive sectors in Navarra and Galicia, the autonomous region in which Vigo is located.

This process of intensification of work pace has caused a worsening of the occupational health of workers across the board, as confirmed by data extracted from the Institute of Occupational Health and Safety of Galicia (ISSGA) and the Navarra Institute of Occupational Health (INSL). In the case of Vigo, the number of annual work accidents in the Galician automotive sector has been increasing since 2012 (a 75% jump in work-related accidents per year for the five years observed, almost half occurring at Vigo). During these years, approximately 50% of work accidents reported in the Galician automotive sector have cited 'overload' as their main cause [3]. The injuries most frequently sustained due to accidents in the automotive sector in Galicia have been sprains and strains (about 60% of total), followed by superficial injuries (about 30%) [4]. Meanwhile, psycho-social infirmities related to anxiety, stress, and depression have also increased. In the case of Navarra, as in Vigo, strong intensification in the work pace has given rise to increased accidents and severity of injuries. Beginning in 2005, the accident frequency index and the severity of accidents both grown considerably; this trend was reversed from 2009 into 2012. However, in more recent years, the number and severity of accidents has again been on the rise, along with incidence of sick leave. This has been true not only at the assembly plants but among suppliers, where 80% of workers interviewed cited the problem of increasing sick leave motivated by physical fatigue, injuries, and psychological pressures. Aware of the need to reduce these indices, all workers interviewed alleged that the companies are not advancing the necessary measures to address this trend.

4. EFFECTS OF ADJUSTMENT ON LABOR PRODUCTIVITY

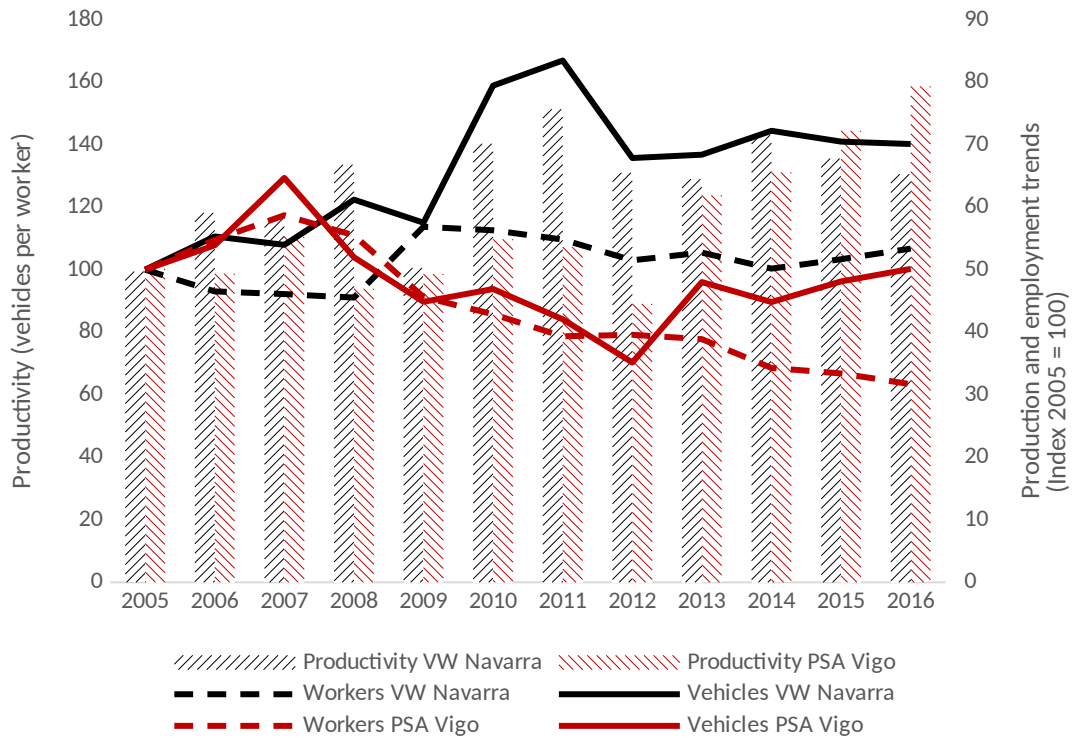
The conceptualization of labor productivity and especially its measurement involve methodological difficulties that have long been subject to debate in the economic literature. In this section we attempt an approximation of the behavior that has characterized labor productivity at VW Navarra and PSA Vigo.

Having taken the automotive manufacturing plant as our unit of analysis, we here seek to measure productivity in physical terms; the final product can be considered homogeneous, yielding a relatively accurate measurement of production, regardless of price fluctuations that may affect this component as a numerator when selecting a monetary variable. On the other hand, the number of employees has been used as a denominator, thus demanding several qualifications. First, it must be noted that the chosen variable is registered in annual terms, but that fluctuations in the volume of employment over the interval of each year have not been accounted for; neither is the contractual composition of the workforce here valued, although that factor (highly heterogeneous, for example, in terms of the workday lengths of employees) is particularly relevant to both cases. Nor do we consider here the distribution of staff between production and administrative functions, despite varying relevance to the production process.

At the PSA Vigo factory, labor productivity has fluctuated; although relatively stable during the 2005-2012 period, it saw sustained growth during subsequent years. In 2012 the trend changed due to a divergence between the two variables that compose the quotient from which productivity is calculated. On the one hand, following a decline in the early years of the economic crisis, the manufacture of vehicles at the Vigo factory returned in 2012 to production levels similar (though somewhat lower) to those registered before the outbreak. In contrast, the number of employees at the factory has experienced gradual but sustained decline from the beginning of the crisis to the present.

In the case of VW Navarra, labor productivity has been evolving since 2002, following a path of continued growth except in the launch period. Growth was especially strong between 2010 and 2015, responding to the combination of an increase in production volume and a progressive decrease in the workforce.

Graph 2. Productivity trends in VW and PSA



Source: authors' elaboration based on VW Navarra and PSA Vigo reports data

In short, the adjustment in working conditions at both plants and the severe intensification of work pace have proven determining factors in the strong increase in productivity. Productivity levels at both plants are remarkably high in comparison with others from their sector in Spain and across Europe.

Although productivity in the overall vehicle manufacturing sector in Spain for the last ten years has been between 37 and 40 vehicles per worker per year, at the Vigo plant this range is between 50 and 80 vehicles, peaking in 2013. At the VW Navarra factory, the rate is approximately 70 vehicles per worker per year. The main difference between the average and these cases is due to the fact that manufacturers in Spain have generally increased, not decreased, their numbers of employees. Regarding workers within the sector by autonomous region, Navarra produces 25.2 vehicles per worker per year, while Galicia this produces 25.6 vehicles, compared to the national average of 16.4 vehicles per worker. It may be conjectured *a priori* that, while these higher rates of regional productivity may be due to a number of factors, relative importance may be assigned to those factors that have driven increases in productivity at the VW Navarra and PSA Vigo plants.

Meanwhile, according to data extracted from OICA and Eurostat, the average productivity in automotive assembly plants throughout Europe has been still lower, at between 15 and 17 vehicles produced per worker per year, and at about 7 vehicles produced per worker per year in the whole of the European automotive sector.

5. CONCLUSIONS

The automotive industry has historically been a vanguard sector in terms of evolving models of productive organization, making it a rich field for the observation and analysis of trends in manufacturing industries worldwide.

In this study we have sought to examine how changes in the models of productive organization influence working conditions, with analysis centered on the current period of economic instability. To this end, we have focused on the model of productive organization in the automotive sector, including its most recent innovations, such as the implementation of modular platforms. In a context of fragmentation of international production, we have valued the importance of profitability strategies developed by the large business groups involved, which (within the framework of global production chains) have shown an ability to coordinate and, in some ways, exercise effective operational control across the whole chain.

In a sector where the model of productive organization has been based on a system of 'lean production', few disruptive organizational innovations have occurred in recent decades. At a technological level, the implementation of a new generation of modular platforms has generated a trend toward homogenization and

standardization of conditions in the sector, intensifying competition among manufacturers as well as among plants within each given group. In that context, labor conditions have been established as the main adjustment variable in terms of competitiveness, especially during the economic crisis.

Through analysis based on two case studies (the PSA Vigo and VW Navarra assembly plants), we have seen how the current competitiveness strategy has depended heavily on the adjustment of working conditions. In both cases, numbers of workers have been substantially reduced, labor flexibility mechanisms have been increased, wage containment has been achieved and, above all, workloads have intensified severely.

These adjustments in working conditions have driven both plants to unusually high levels of productivity, above the averages of their respective manufacturing groups and even higher relative to other automotive manufacturers.

It is worth noting that some differences have been detected in the intensity of these strategies. Although internal flexibility and varied contracting approaches have allowed both automotive companies under study to follow profitability strategies driven principally by the reduction of labor costs, in the case of PSA Vigo, labor flexibilization measures have been stronger than at VW Navarra. At Vigo, internal flexibility mechanisms such as the extension of workdays and the intensification of pace, along with external flexibility (via temporary staff) and flexibility in salaries, have not stemmed the use of dismissal mechanisms or EREs. At VW Navarra, a similar path has been followed, but with fewer flexibilization measures imposed. These changes seem to have had both direct and indirect impacts on the labor conditions (physical, psychological, remunerative) experienced by workers.

As this research remains in progress, we should add that one of the main elements we have identified as a differentiating variable between the two cases is the role played by union strength, which has served as a buffer against the worsening of working conditions. While union strength has deteriorated in both regions, the workers at PSA Vigo have seen much more drastic adjustment and flexibilization, while in Navarra unions have shown a greater capacity to forestall the increased flexibilization of labor relations.

Elements such as the increasing fragmentation and externalization of production, the segmentation of workers collectives within companies, relationships of dependency and subordination on the part of suppliers vis-à-vis the manufacturers, and competition among plants of the same group for the assignment of production (often conserving jobs at the expense of working conditions) all increasingly serve to hinder union action and to weaken collective bargaining, undoubtedly making these issues central to understanding the continued deterioration of working conditions.

In short, given the results obtained, we are observing two general tendencies that overlap and that seem to coincide in both studies. In the first place, there has been in recent years a gradual worsening of workplace health and safety conditions as well as a deterioration in wage conditions for the majority of workers involved in production at both Vigo and Navarra. Moreover, growing segmentation of the workforce has resulted in the coexistence of distinct working conditions within the same manufacturing process. These two trends appear to have consolidated in the wake of reforms to labor legislation and as a result of both profitability strategies and the requirements of the current model of productive organization.

REFERENCES

- BOYER, R.; FREYSSENET, M. (2003): *Los modelos productivos*. Editorial Fundamentos.
- CORIAT, B. (1993): *El taller y el robot: ensayos sobre el fordismo y la producción en masa en la era de la electrónica*, Siglo XXI.
- DURAND, J. P. (2009): *La chaîne invisible: travailler aujourd'hui: flux tendu et servitude volontaire*. Le Seuil.
- FINE, C.H. (1998): *Clockspeed: Winning industry control in the age of temporary advantage*. Basic Books.
- FUJIMOTO, T. (2007): Architecture-based comparative advantage—a design information view of manufacturing. *Evolutionary and Institutional Economics Review*, 4(1), 55-112.
- FUJIMOTO, T.; TAKEISHI, A. (2001): Automobiles: strategy-based lean production system. *Hitotsubashi University Institute of Innovation Research*.
- LAMPÓN, J.; CABANELAS, P. (2014): La estrategia de plataformas modulare ¿Una nueva revolución en la organización de la producción en el sector del automóvil?. *Universia Business Review*.
- MCALINDEN, S.P.; SMITH, B.C.; SWIECKI, B.F. (1999): The future of modular automotive systems: where are the economic efficiencies in the modular assembly concept? *University of Michigan, Transportation Research Institute, Office for the Study of Automotive Transportation*.
- STURGEON, T.; FLORIDA, R. (2000): Globalization and jobs in the automotive industry. *Final report to the Alfred P. Sloan Foundation. International Motor Vehicle Program, Center for Technology, Policy, and Industrial Development, Massachusetts Institute of Technology*.
- TAKEISHI, A.; FUJIMOTO, T. (2001): Modularization in the auto industry: interlinked multiple hierarchies of product, production, and supplier systems. *Hitotsubashi University Institute of Innovation Research*.

TASALLOTI, H.; ESKELINEN, H.; KAH, P.; MARTIKAINEN, J. (2016): An integrated DFMA-PDM model for the design and analysis of challenging similar and dissimilar welds. *Materials and Design*, 89, 421-431.

WOMACK, J. P.; JONES, D. T.; ROOS, D.; CHAPARRO, F. O. (1991): *The machine that changed the world: the story of lean production*. Harper Collins.

SOCIAL EFFECTS OF ENERGY SUBSIDIES AND TAXES ON CO₂ EMISSIONS IN MEXICAN AQUACULTURE PRODUCTION: THE CASE OF SHRIMP LARVAE PRODUCTION

DANIEL PEÑALOSA MARTINELL

Instituto Politécnico Nacional/Centro Interdisciplinario de Ciencias Marinas/Avenida Instituto Politécnico Nacional SN, Playa Palo de Santa Rita, 23096 La Paz, B.C.S., México/dpmartinell@hotmail.com

MARCELO ARANEDA PADILLA

Benchmark genetics. Ruta 7 Carretera Austral Km. 35, Chaicas, Puerto Montt, Chile

GERMÁN PONCE DÍAZ

Instituto Politécnico Nacional/Centro Interdisciplinario de Ciencias Marinas
Avenida Instituto Politécnico Nacional SN, Playa Palo de Santa Rita, 23096 La Paz, B.C.S., México

e-mail Daniel Peñalosa: dpmartinell@hotmail.com

Abstract

Aquaculture has diverse externalities dependent on several factors, such as the production system or the facilities' location. Most negative externalities correspond to environmental deterioration, for example, through the emission of greenhouse gases. Regarding Mexican public policies, there are two contradictory tools that affect the emission of CO₂ from aquaculture. On the one hand, there is a tax imbedded in the price of fuel to discourage its use. On the other hand, there is a subsidy applied, exclusively to agriculture, on fuel and energy consumption. This paper analyzes the effect of these two policies on society through a benefit-cost analysis, using the production of shrimp larvae as a case study. The effect of new technologies, specifically the use of probiotics, is discussed. It was estimated that 9733 tons of CO₂ year⁻¹ are emitted in Mexico derived from the production of shrimp larvae, the social equilibrium point corresponds to an emission level of 6489 tons of CO₂ year⁻¹. As a result, a negative social utility of -13 million USD year⁻¹ is observed. If the use of probiotics is adopted, emissions are reduced to 1935 tons of CO₂ year⁻¹ and the social utility, despite continuing being negative, is reduced by 96%.

1. INTRODUCTION

According to the UN, limiting the temperature increase to 1.5 °C instead of 2°C by 2100 would have major positive impacts to the ecosystems, human health and sustainability in general (IPCC, 2017). To achieve this goal, greenhouse gas emissions must be reduced by 45% by 2030 respect to 2010 emission levels. Some initiatives to achieve this reduction are already ongoing, but they must be accelerated.

As any other transformation, all food production activities have environmental costs, which must be analyzed and compared with each other in a fair way (Bartley et al., 2007). Aquaculture is the latest of all food production industries to develop in an industrial and highly productive activity; this has some disadvantages, like the lesser amount of information available and the lack of policies aimed to reduce its environmental impact; as well as some advantages, like the possibility of applying new policies and instruments to reduce the environmental impact.

On the other hand, according to some authors, the only way to provide the increasing human population with quality protein obtained from seafood without depleting the worlds' oceans is aquaculture (Paez-Osuna et al. 2003, Bené et al., 2016). Also, this industry provides an important amount of employment, especially in developing countries in Asia and Latin America (Neiland et al., 2001). Because of this, the main challenge facing the industry is how to continue growing in a more sustainable way.

Several instruments and policies exist designed to promote the reduction of pollutants. Of these, the classic economic tools available are: the imposition of taxes aimed to discourage certain conducts such as the consumption of fuels or the emission of pollutants, and the use of economic incentives such as fiscal reductions or subsidies, designed to encourage certain conducts that have a positive impact on a desired outcome, like the promotion of renewable energies or the adoption of new technologies with higher environmental performance.

1.1. SOCIAL EQUILIBRIUM

A cleaner environment has very clear positive effects on society, from the reduction of diseases and an increase in life expectancy, to a higher enjoyment of natural resources, in tangible ways such as increase in food and resource availability, and economic growth; and a intangible ways like recreation or cultural heritage (Grossman & Krueger, 1995; Mariani et. al., 2010; Markantonis et. al., 2012).

The social equilibrium point is understood as the level of pollutants reached at the point where the sum of the marginal damage (MD), which is equal to the damage to society caused by the emission of a pollutant, and the Marginal Abatement Cost (MAC), which “represents either the marginal loss in profits from avoiding the last unit of emissions or the marginal cost of achieving a certain emission target given some level of output” (Klepper & Peterson, 2006 p.3), is equal to zero.

$$DM+MAC=0$$

At this point, society and industry share the effect of pollutants equitably. Graphically, it is the point at which these values converge (figure 1).

Thou, the objective of public policies (such as taxes and subsidies) linked with environmental impact should aim to achieve the social equilibrium and/or to promote cleaner practices. Consequently, a tax can be seen as a charge that Society applies to a polluting industry, and a subsidy can be considered a payment method designed to compensate companies for reducing their emissions. In this case, the social equilibrium will shift in the presence of any such policy.

For instance, when a tax is applied proportionally to emissions, the company's MAC increases, shifting the social equilibrium to the right (figure 1). In this example, society accepts a monetary compensation in exchange for an increase in the amount of CO₂ emissions accepted to achieve equilibrium. The benefits obtained by such tax can be then applied to other policies aimed to reduce the negative externalities of pollution such as reforestation programs or recycling plants.

On the other hand, when a subsidy is applied, a company's MAC is reduced and the social equilibrium shifts to the left. In this case, Society is paying a compensation to the company in order to reduce their emissions, reducing the amount of the pollutant needed to achieve the social equilibrium (figure 1).

Although the policies described above have an impact on the social equilibrium point, they do not compel the company to reduce its emissions, permitting to emit at their highest possible point. In order to achieve the equilibrium, complementary policies must be introduced such as carbon bonds or a penalty when emitting over the social equilibrium point.

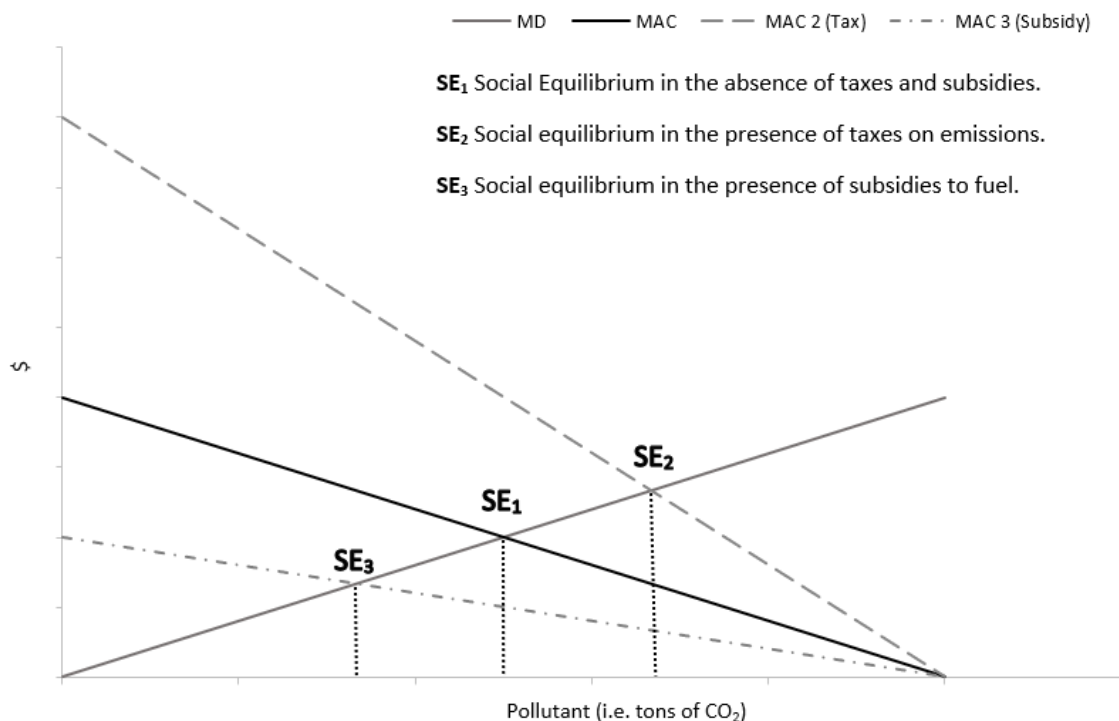


Figure 1: Illustration of the effects of taxes and subsidies on company's marginal abatement costs (MAC) and their impact on the estimation of the social equilibrium point.

1.2. THE CASE OF MEXICO

In Mexico, there are two policies that affect the emission of CO₂ from the agricultural, including aquaculture, industry and have a social impact associated with them. The first is the existence of a general tax on emissions based on the "polluter pays" principle called the Special Tax on Production and Services (IEPS) and its introduced in all oil-based fuels (for both, gasoline and diesel). The IEPS is classified as the difference between the price of sale to the public (without VAT) and the international reference price of these products (Hesca-Reynoso & López-Montes, 2016).

Mexican oil market used to be controlled by the government. Prices were fixed via subsidies and the industry consisted of a government owned monopoly (Mexican Petroleum or Pemex for its acronym in Spanish). Since 2016, the government opened the Mexican petroleum market through an energetic reform based on Neo Liberal economic ideas, allowing companies different from Pemex to explore, explode, produce and sell oil and oil-based products, thus liberating the fuel prices and making them variable throughout the year.

Since the changes in energy policies observed, the IEPS changed its form and now consists of three installments, namely: a state quota, a federal quota and a carbon quota. Although the IEPS as a whole can be variable depending on the price of fuels and the peso-dollar exchange rate, the component of the carbon quota is fixed during the year and adjusts to inflation annually. In 2017, this quota was equal to 13.84 cents of peso (around 0.007 USD) per liter of diesel (SHCP, 2017; Limón-Portillo, 2018).

In theory, this type of tax is designed to discourage fuel consumption. In addition, the collection of this tax could be used, for example, to reduce the damage caused by the emission of CO₂; for this reason, the result of this tax can be considered a social benefit derived from the acceptance of an increase in the level of emissions.

On the other hand, there are a series of fiscal incentives (Limón-Portillo, 2018) and subsidies that encourage the use of fossil fuels. Specifically, in the application of subsidies, the Mexican government has a policy aimed at those who carry out aquaculture activities and use electricity in their Aquaculture Production Units. This subsidy consists of an energy quota (in Kwh / year) which is granted on top of stimulus prices (special energy prices for agricultural productions, including aquaculture), representing discounts of 50 percent on the total amount of the energy consumption billing (before applying the value-added tax), up to the amount of the assigned energy quota (CONAPESCA, 2019). If the production unit does not have access to the energy network, there exists a subsidy of 2.00 MXN (equivalent to 0.1 USD) per liter of diesel for up to 2 million liters (CONAPESCA, 2019).

It is important to remark that, according to official sources, more than 70% of all the energy produced in Mexico comes from the combustion of fossil fuels (SENER, 2018). In the case of aquaculture production, since infrastructure is usually located far from urban nuclei, energy must be produced by the farmers, usually through the use of Diesel based generators.

Thus, there is a conflict of objectives between these two policies. On the one hand, the IEPS is designed to discourage the consumption of fossil fuels in order to reduce CO₂ emissions; on the other hand, there is a subsidy designed to encourage food production, but applied to a reduction in energy costs, though encouraging the consumption of energy (based on fossil fuel combustion) and promoting the emission of CO₂.

1.3. REDUCTION OF ENVIRONMENTAL IMPACT, THE USE OF PROBIOTICS

Another way to face this challenge is with the application of new technology that must take into account not only the economic growth of the industry, but also must aim to reduce its negative impacts as outlined in for example (Liu and Sumaila, 2007; Liu and Sumaila, 2008).

One example of these technologies is probiotics. In aquaculture, probiotics are understood as the application of live bacteria to the food or to the water given to the cultured organisms in order to enhance their growth and survival (Kesarcodi-Watson et al., 2008; Yan Loh, 2017). The benefits of probiotics lie mainly in the inhibition of growth of pathogenic bacteria, the enhancement of the immune system and digestion (making the organisms grow faster) and the reduction of toxic NH₄ to non-toxic and finally to environmentally friendly N₂ (Crab et al. 2008; Zhou et. al., 2009; Yan Loh 2017). Deepening on the last point, this transformation from ammonia NH₄⁺ to non-toxic N₂ has an important effect on the use of energy. On one hand, it allows the reduction of water use by reducing the need to change water often, reducing energy use for pumping; since less water is needed, less energy for heating it is needed. Nonetheless, aerobic bacteria will consume a higher amount of oxygen, making the intensity of aeration higher.

With this in mind, this work aims to answer the following questions (1) How does the use of subsidies and taxes on fuel used in aquaculture impact CO₂ emissions and how does this affect society? And (2) How does the use of new technologies, like probiotics, might help reduce CO₂ emissions from aquaculture?

Of all aquaculture commodities, the environmental cost of shrimp aquaculture is the highest due to the depletion of ecologically important areas like mangroves, the capture of shrimp larvae from the wild, the emission of highly pollutant effluents and the high use of antibiotics needed to protect production from diseases, which are increasingly aggressive and more often due to the use of high culture densities (Bachere, 2000; Paez-Osuna, 2001; Hatje et al. 2016). Of shrimp production, the stage that has higher control, and therefore more energy consumption per m³, is the hatchery stage, which requires the aeration, heating and recirculation of water. For these reasons, this work uses the production of shrimp larvae in Mexico as a case study.

2. METHODS

A mathematical model was developed based on the literature, observed data and employee interviews of a laboratory with 1,320 m³ of installed capacity capable of producing 135 million larvae per batch. The model is used to estimate the emission of CO₂ associated with the production of shrimp larvae as well as to assess effects of probiotic on said emissions.

2.1. THE MODEL

Production: the mean and SD of the rearing days of 15±2 days was assumed for each production batch. Each year has between 6 and 8 production batches. The larvae density was assumed to be 180±10 Larvae per liter. Each production tank has 20 m³ the lab has a total of 66 tanks. On the group that uses probiotics, the amount was given on a 2x10⁹ CFU m³⁻¹ day⁻¹ with an inoculum density of 8.55x10⁸ CFU L⁻¹. All variables except the amount of probiotic given and therefore the energy used are assumed to be equal.

The 3 main energy consumption activities carried out during the larval culture, i.e., water exchange, heating energy and aeration power; were modeled using production data, existing literature and interviews with employees.

Water exchange: A daily 15±5 % of the total volume was estimated for the group without the technology compared to a 5±2% if the energy is used. The energy consumed by this activity was estimated calculating the required water flow and the power of the water pumps available in the market.

Heating energy: the energy needed is directly linked with the water exchange. Mean values of seawater temperature registries in the area were used with values of 24±3°C

Aeration: Oxygen consumption from larvae (Villarreal, 1994) and the bacteria was estimated. After that, the airflow needed was calculated and the power needed to provide said airflow was obtained based on the products

available on the market.

Based on the created model, a benchmark of the production's performance regarding emissions with the optimum use of probiotics (group A) and without using probiotics (group B) was carried out. To obtain the total emissions generated by the shrimp larvae industry in Mexico, an estimated of CO₂ emissions per larvae was obtained and then multiplied by the latest available value of annual production of white shrimp (*Penaeus vannamei*) larvae in Mexico, equal to 1x10¹⁰ larvae per year (INAPESCA, 2013).

Based on the benchmarking analysis, suggestions of policies aimed to reduce CO₂ emissions from the industry are issued.

The model was implemented in Excel and the stochastic elements were taken into account by a 2000 reiteration Monte Carlo analysis using the program CrystalBall.

2.2. SOCIAL EQUILIBRIUM ESTIMATION

The average MD per ton of CO₂ published in peer-reviewed journals (Tol et al., 2005) was used, which is equal to 50 USD tonCO₂⁻¹.

To calculate the MAC, the following relationship was assumed:

$$MAC_O = \frac{\Pi_{D1} - \Pi_{D2}}{CO2_{D1} - CO2_{D2}}$$

Where MAC_O is the marginal cost of abatement of a laboratory producing shrimp larvae that does not use probiotics, Π represents the benefits obtained after a productive cycle, the suffix D represents the density of culture, with D1 being the current state (180 larvae per liter) and D2 the density of production that allows to reduce the emission of pollutants by 1 unit (according to the model 130 larvae per liter). CO₂ represents the emission of carbon dioxide in annual tons. Then, the effect of the use of probiotics on the marginal abatement costs (MAC_W) is added to the previous relationship:

$$MAC_W = MAC_O + \left(\frac{\Pi_W - \Pi_O}{CO2_W - CO2_O} \right)$$

Where the suffixes W and O refer to the use or disuse of the technology respectively.

2.3. SOCIAL UTILITY ESTIMATION

The effect of a proportional tax and subsidies can be reduced to a cost-benefit analysis. From a Society point of view; the value of the subsidy (cost) must be subtracted from the value of the tax (benefit), obtaining the social utility. In the absence of other policies, the absolute value of these costs and benefits can be estimated using:

$$B_S = \int_0^n A C_I - \int_0^n A C_F$$

$$C_S = \int_0^n A C_F - \int_0^n A C_S$$

$$P_S = B_S - C_S$$

Where B_S represents the social benefits obtained when applying the tax, C_S is the social cost derived from the existence of subsidies, $A C_I$ is the company's MAC function in the presence of taxes and absence of subsidy, $A C_F$ is the company's MAC function in absence of tax and subsidy, $A C_S$ is equal to the company's MAC function in the presence of subsidy and absence of tax, and P_S is the social utility obtained after applying both taxes and subsidies.

3. RESULTS

At laboratory level, a significant difference ($p < 0.01$) in the CO₂ emissions between both groups was observed. Also, significant differences were found on the amount of energy used ($p < 0.01$), the energy costs ($p < 0.01$) and the emission of nutrients (phosphorus and nitrogen) on the effluents ($p < 0.05$). MAC for group A and group B were estimated in 78.64 and 92.03 USD tonCO₂⁻¹ respectively without the presence of taxes or subsidies.

As stated in the introduction, current CO₂ tax in Mexico is embedded in the price of gasoline, for this reason all fuel consumers pay a portion associated with the emission of polluting gases equal to 0.1384 pesos per liter, this causes the curve of the MAC to rise by 1.25 USD per ton, passing on the cost of contaminating to the company, causing society to accept the increase in emissions in exchange for an economic retribution.

The effect of subsidies on the results will be reflected on the value of the marginal abatement costs. The idea of this subsidy is to increase production, helping aquaculture being profitable. Regardless, since the subsidy is applied on energy costs, the production increase will be associated with an increase in pollution levels; the MAC of the company is reduced by -2.82 USD per ton, more than double the effect that was observed with the taxes. In this case, society is assuming the costs of polluting, expecting in exchange a reduction in the amount of pollution accepted to achieve equilibrium. In both cases, changes in the social equilibrium point are not significant ($p > 0.05$).

In Mexico, both opposing policies exist simultaneously. This causes the MAC curve to shift both upwards and downwards, shifting the social equilibrium both left and right. Nonetheless, since the value of the subsidy is substantially higher than the tax, society ends up with a negative utility.

At the Mexican shrimp larvae industry level, without regulation that restricts emissions, production using probiotics will emit 1935 CO₂ tons year⁻¹, while the absence of the technology would produce 9733 CO₂ tons year⁻¹. The social equilibrium point assuming the non-use of probiotics (group B) is found at a level of emissions of 6489 CO₂ tons year⁻¹. Meanwhile the group A's social equilibrium point is around the 1290 CO₂ tons year⁻¹. That means that, without accounting for changes in MAC between groups, the use of probiotics alone helps to emit more than 4500 tons below the social equilibrium point established for the industry without the use of the technology (figure 2).

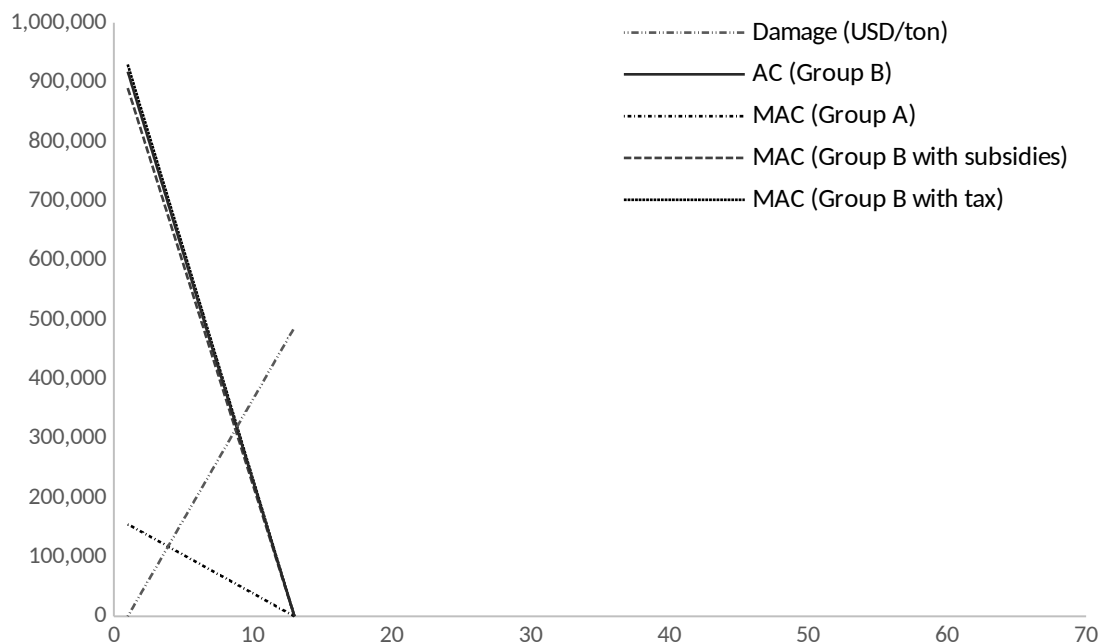


Figure 2: Total damage and abatement costs estimated for one production year of the shrimp larvae industry in Mexico assuming absence of use of probiotics as well as optimum use of the technology and the effect of current levels of taxes and subsidies in Mexico.

As of social utility, both groups show a negative value. Income from taxes for groups A and B are estimated at 2,340,562 and 59,147,124 USD respectively. Meanwhile, costs from subsidies correspond to 5,279,938 and 133,570,533 USD respectively. This way, the total social utility would be of -2,939,376 USD year⁻¹ assuming the use of the technology and -74,423,409 USD year⁻¹ assuming the non-use of probiotics, that is, even without extra regulation, the use of probiotics would reduce the negative social utility by 96%.

4. DISCUSSION

Even though the implementation of an emission tax in Mexico is already a big step forward towards reducing emissions, the tax value might still be too low to achieve a positive social utility regarding aquaculture production. Furthermore, there are no current policies aimed at reducing emissions towards the social equilibrium, that means that regardless of the social equilibrium point, laboratories will continue emitting pollutants at their maximum, since there is no penalty or restriction to it.

According to Klepper and Peterson (2006), the value of the shadow cost associated to the emission of pollutants should be equal to the tax that would have to be levied. If this were the case, the current value of the tax associated to emissions of CO₂ for the shrimp larvae industry, that is 0.1384 MXN, should be around the same value of the MAC estimated in 92.03 MXN (approximately 4.84 USD) for group B and 78.64 MXN (approximately 4.14 USD). The application of both taxes depending on the use/disuse of the technology could be a fiscal incentive to adopt the technology.

With current competition in the aquaculture industry, producers tend to maximize profit by increasing the production density (Naylor et. al. 1998), this comes hand in hand with an increase in food, chemicals and energy consumption and therefore with an increase on CO₂ emissions. Since the energy costs are “artificially” driven down and there is no penalty on polluting, total CO₂ produced augments, and social benefits are reduced if the same taxation policy is maintained.

It's important to remark that the objective of currently applied subsidies in Mexico is to increase production in order to make food available at a reasonable price, and not to reduce/increase pollution. Regardless, the effect of increase in production without any regulation aimed at controlling the emission of pollutants will result in an increase of pollution. Furthermore, the effect of farmed shrimp on food security is polemic, with some authors even considering it to be counterproductive, due to the high amount of fishmeal and fish oil on their diets (Naylor et. al., 1998; Bondad-Reantaso et. al., 2012) making subsidizing its production a rather unnecessary practice. Finally, the model assumes either total absence of probiotics or an optimum use of the technology, the reality of production would probably lay between both, with most laboratories using probiotics but possibly in a non-optimum manner.

The use of emission taxes and the application of fuel subsidies appear to be contradictory policies, since the first one aims to a reduction of the emissions meanwhile the second one induces an increase in the production of CO₂. A possible solution for this would be to transfer current subsidies applied to energy consumption, and to use them to promote the application and development of new technology that, like probiotics, permits an increase in production in a sustainable way, benefiting both society and the aquaculture industry.

REFERENCES

- BACHERE E., (2000). Shrimp immunity and disease control. *Aquaculture* 191: 3-11.
- BARTLEY, D.M., BRUGRE, C., SOTO, D., GERBER, P., HARVEY, B. (2007) Comparative assessment of the environmental costs of aquaculture and other food production sectors: Methods for meaningful comparisons. FAO/WFT Expert Workshop 24-28 April 2006 Vancouver, Canada.
- BÉNÉ C. ARTHUR R. NORBURY H. ALLISON E. H. BEVERIDGE M. BUSHE S. CAMPLING L. LESCHEN W. LITLED D. SQUIRES D. THILSTED S. H. TROELLI M. WILLIAMS M. (2016) Contribution of Fisheries and Aquaculture to Food Security and Poverty Reduction: Assessing the Current Evidence. *World Development* 79: 177-196.
- BONDAD-REANTASO, M. G., SUBASINGHE, R. P., JOSUPEIT, H., CAI, J., ZHOU, X. (2012). The role of crustacean fisheries and aquaculture in global food security: past, present and future. *Journal of invertebrate pathology*, 110(2), 158-165.
- CRAB R., AVNIMELECH Y., DEFOIRDT T., BOSSIER P., VERSTRAETE W. (2007) Nitrogen removal techniques in aquaculture for a sustainable production. *Aquaculture* 270: 1-14.
- CONAPESCA (2019). Apoyo de cuota de energía eléctrica para instalaciones acuícolas. Programa Especial de Energía para el Campo en materia de energía eléctrica para uso acuícola. Available in Spanish at <https://www.gob.mx/conapesca/acciones-y-programas/programa-energia-electrica-para-uso-acuicola>.
- GROSSMAN G. M., KRUEGER A. B. (1995) Economic Growth and the Environment. *The Quarterly Journal of Economics* 110:2 353-377.
- HANOI (2016) Mexico's Policy Update on Carbon Pricing.

- HUESCA REYNOSO L., LÓPEZ MONTES A., (2016) Impuestos ambientales al Carbono en México y su progresividad: una revisión analítica. *Economía Informa* núm 398 pp. 23-39.
- HATJE V., DE SOUZA M. M., RIBEIRO L.F., EÇA G. F., BARROS F. (2016). Detection of environmental impacts of shrimp farming through multiple lines of evidence. *Environmental Pollution* 219: 672-684.
- INAPESCA (2013) Shrimp aquaculture in Mexico, generalities and statistics. Available in Spanish at <https://www.gob.mx/inapesca/acciones-y-programas/acuacultura-camaron-blanco-del-pacifico>
- IPCC (http://www.ghgprotocol.org/calculation-tools#cross_sector_tools_id) Emission factors from cross-sector tools, March 2017.
- KESARCODI-WATSON A., KASPAR H., M. LATEGAN J., GIBSON L. (2008). Probiotics in aquaculture: The need, principles and mechanisms of action and screening processes. *Aquaculture* 274: 1-14.
- KLEPPER G & PETERSON S. (2006) Marginal abatement cost curves in general equilibrium: The influence of world energy prices. *Resource and Energy Economics* 28 1-23.
- LIMÓN PORTILLO A. (2018) Ingresos petroleros vs IEPS a combustibles. El impacto recaudatorio del estímulo Fiscal. Centro de investigación económica y presupuestaria A.C. pp.4
- LIU, Y. AND SUMAILA, U.R. (2007). Economic analysis of netcage versus sea-bag production Systems for salmon aquaculture in British Columbia. *Aquaculture Economics and Management.*, 11, 413–437.
- LIU, Y. AND SUMAILA, U.R. (2008) Can farmed salmon production keep growing? *Marine Policy*, 32, 497-501.
- MARIANI F., PÉREZ-BARAHONA A., RAFFIN N. (2010) Life expectancy and the environment. *Journal of Economic Dynamics & Control.* 34 798-815.
- MARKANTONIS V., MEYER V., SCHUARZE R. (2012) Valuating the intangible effects of natural hazards – review and analysis of costing methods. *Natural Hazards and Earth System Sciences.* 12 1633-1640.
- NAYLOR R. L., GOLDBURG R. J., MOONEY H., BEVERIDGE M., CLAY J., FOLKE C., KAUTSKY N., LUBCHENCO J., PRIMAVERA J., WILLIAMS, M. (1998). Nature's subsidies to shrimp and salmon farming. *Science* 282:5390 883-884. DOI: 10.1126/science.282.5390.883
- NEILAND A. E., SOLEY N., VARLEY J. B., WHITMARSH D. J. (2001). Shrimp aquaculture: economic perspectives for policy development. *Marine Policy* 25: 265–279
- PÁEZ-OSUNA F. (2001) The Environmental Impact of Shrimp Aquaculture: Causes, Effects, and Mitigating Alternatives. *Environmental Management* 28-1:131–140.
- SENER (2018) Programa de Desarrollo del sistema eléctrico Nacional 2018-2032. Pp. 318
- SHCP (2017). Presupuesto de gastos Fiscales 2017. Available in Spanish at https://www.gob.mx/cms/uploads/attachment/file/236020/PGF_2017.pdf.
- TOL R. (2005) The marginal damage costs of carbon dioxide emissions: an assessment of the uncertainties. *Energy Policy*.num. 33:16 pp. 2064-2074.
- VILLARREAL H., HINOJOSA P., NARANJO J. (1994) Effects of temperatura and salinity on the oxygen consumption of laboratory produced *Penaeus vanammei* postlarvae. *Comparative Biochemistry and Physiology* 108: 331-336.
- YAN LOH J. (2017) The Role of Probiotics and Their Mechanisms of Action: An Aquaculture Perspective. *World Aquaculture* 19-23
- ZHOU X. X., WANG Y., LI W. (2009) Effect of probiotic on larvae shrimp (*Penaeus vannamei*) based on water quality, survival rate and digestive enzyme activities. *Aquaculture.* 287: 349-353.

OPORTUNISMO EN LOS NEGOCIOS: CASO LA MANÁ

FABIAN X. MARTÍNEZ-ORTIZ

Universidad de Vigo/Universidad Técnica de Cotopaxi-La Maná
fabian.martinez@utc.edu.ec

CARLOS M. FERNÁNDEZ-JARDÓN

Universidade de Vigo
cjardon@uvigo.es

XAVIER MARTÍNEZ-COBAS

Universidade de Vigo
xmcobas@uvigo.es

e-mail de Fabian Martínez: fabian.martinez@utc.edu.ec

Resumen

Las pymes de subsistencia son muy importantes en los países en vías de desarrollo y en particular en Ecuador. Aunque previamente se ha estudiado y evidenciado el efecto que tiene el capital relacional sobre el desempeño y rendimiento de las empresas, y, en particular como la cultura organizacional condiciona dicho efecto, las características de esas empresas pueden implicar diferentes resultados. El objetivo de esta investigación es determinar si el efecto de la cultura empresarial modera o cambia el efecto que tiene del capital relacional sobre el desempeño de las pymes de subsistencia en Latinoamérica. Para cumplir con este objetivo se utiliza encuesta a 980 PDS y mediante técnicas de ecuaciones estructurales analizar cuáles son los efectos. Como hipótesis se plantea que la cultura empresario mejora el efecto que tiene el capital relacional sobre las ventajas competitivas generando mejores resultados.

Palabras clave: Capital relacional, pymes de subsistencia, cultura empresarial, ventajas competitivas, rendimiento.

Abstract

Subsistence SMEs are very important in developing countries and particularly in Ecuador. Although it has been previously studied and evidenced the effect of relational capital on the performance and performance of companies, and, in particular as the organizational culture conditions that effect, the characteristics of these companies can imply Different results. The objective of this research is to determine whether the effect of business culture moderates or changes the effect of relational capital on the performance of subsistence SMEs in Latin America. To comply with this objective, a 980 PDS survey is used and by techniques of structural equations analyze what the effects are. As a hypothesis it is argued that entrepreneurial culture improves the effect of relational capital on competitive advantages by generating better results.

Key words: Relational Capital, subsistence SMEs, business culture, competitive advantages, performance.

Thematic Area 7: Economy and business

1. INTRODUCCIÓN

En un mundo globalizado donde el comercio cruza fronteras y largas distancias para crear desarrollo y riqueza, existen países con limitaciones económicas en donde aparecen mercados formados por consumidores de baja renta en la que participan negocios informales (London, Anupindi, and Sheth 2010) que surgen como un medio de vida para asegurar las necesidades de una familia siendo de subsistencia. Esos mercados se definen como mercados en la base de la pirámide (BoP).

En economías aún no desarrolladas y dentro de esos mercados aparecen los negocios de subsistencia (PDS), con características similares entre sí. Surgen en el sector de la economía social en la base de la pirámide por factores como la falta de empleo formal en el territorio, la falta de una carrera formal universitaria por parte de los propietarios (Cieslik and D'Aoust 2018; Sridharan et al. 2014), el hecho de que los recursos económicos son muy limitados para competir en tangibles (Fernández-Jardón and Martos 2016), y de que sus actividades comerciales se realizan de manera informal dentro de un entorno dinámico (London, Anupindi, and Sheth 2010). Estos factores sociales dan como resultado la aparición de este tipo de negocios.

Los propietarios de las PDS tienen la necesidad de generar ingresos económicos pero no buscan una proyección a largo plazo (London, Anupindi, and Sheth 2010), sino que por el contrario, permanecen un corto tiempo en el mercado de subsistencia mediante el uso de relaciones comerciales de mutuo beneficio con los agentes de interacción económica (AIE), es decir, los proveedores, clientes y todos aquellos quienes interactúan en el giro normal del negocio en las PDS sirviendo en el BoP.

El objetivo de este estudio es indagar como los negocios de subsistencia interactúan con los AIE en los mercados de subsistencia y, en particular, el posible efecto del oportunismo como medio para obtener resultados financieros.

El estudio es valioso ya que contribuirá en abordar las limitaciones específicas que enfrentan los productores de BoP y enfoques utilizados por las empresas para enfrentar estos desafíos (London, Anupindi, and Sheth 2010). Además, permite reducir la brecha en la comprensión de las estrategias empleadas por los empresarios de subsistencia para obtener recursos económicos en entornos socioeconómicos del BoP.

Este documento comienza con una revisión de la literatura de los negocios de subsistencia, además de las relaciones entre las empresas y los negocios del BoP e incluida la propuesta del oportunismo para obtener resultados financieros. Posteriormente, se examinará la metodología utilizada para evaluar los negocios de subsistencia. En las secciones siguientes del documento se analizan empíricamente un caso de estudio del cantón La Maná en Ecuador. En la última sección del documento se encuentran las conclusiones e implicaciones para la gestión.

2. ESTRUCTURA TEÓRICA

2.1. DEFINIENDO LOS MERCADOS DE SUBSISTENCIA

Los mercados de subsistencia se encuentran ubicados en la base de la pirámide (BoP) (London, Anupindi, and Sheth 2010). Este segmento de mercado está formado por consumidores y proveedores, de bajos ingresos económicos, que crean negocios con el afán de combatir su pobreza y mantener cubiertas las necesidades básicas de la familia (Lindeman 2012; Viswanathan et al. 2019; Cieslik and D'Aoust 2018). En general, el término de subsistencia es usado para referirse a zonas ocupadas ampliamente por renta baja, por ejemplo, poblaciones rurales, que escasamente logran llegar a fin de mes para cubrir sus necesidades (Viswanathan et al. 2019). Los mercados de subsistencia ubicados geográficamente en comunidades, zonas rurales y urbanas crean una cultura particular (Viswanathan et al. 2019) para comercializar y alcanzar beneficios económicos a corto plazo debido a que su objetivo principal es la supervivencia (Cieslik and D'Aoust 2018).

Los negocios de subsistencia operan en entornos económicos impermeables y culturalmente regulados (Cieslik and D'Aoust 2018). Las economías de subsistencia cuentan con rasgos similares característicos entre sí, en donde el comportamiento de los miembros está regulado por las normas y valores culturales (Cieslik and D'Aoust 2018).

Los propietarios de los negocios de subsistencia comparten con los agentes de interacción económica (AIE) relaciones comerciales en búsqueda de resultados financieros logrando crear valor mutuo (London, Anupindi, and Sheth 2010) entre ellos. Los negocios en mercados de subsistencia dependen de una gran cantidad de proveedores y consumidores para obtener productos y comercializarlos (Cieslik and D'Aoust 2018), además crean una red de colaboración junto a los consumidores y proveedores de subsistencia para mitigar la falta de recursos económicos y disminuir el riesgo (Cieslik and D'Aoust 2018) por la falta de tangibles. En general, las investigaciones han calificado a los empresarios de los negocios de subsistencia con un enfoque de supervivencia y no en un crecimiento a largo plazo (Cieslik and D'Aoust 2018).

Las empresas de subsistencia suelen tener escasos activos materiales, por lo que deben concentrarse más en los intangibles a la hora de buscar ventajas competitivas (Hormiga, Batista, and Sanchez 2007) y mantenerse en el mercado como ingreso familiar. Además, representan importancia para las economías nacionales (Vargas-Hernández, Casas Cárdenaz, and Calderón Campos 2016).

Categorización de los tipos de proveedores y de consumidores en el mercado de subsistencia

Las condiciones en un mercado de subsistencia está caracterizado por ingresos económico de bajos (Viswanathan et al. 2019), incertidumbre y proyección a corto plazo (London, Anupindi, and Sheth 2010). Por consiguiente, los proveedores y consumidores de subsistencia distinguidos en diferentes grupos sirven a los negocios de subsistencia en la base de la pirámide y obtienen beneficios mediante interacción económica de valor mutuo (London, Anupindi, and Sheth 2010).

Para caracterizar el comportamiento de esos negocios, es conveniente estudiar cómo son sus proveedores y clientes, aunque en muchos casos, algunos de ellos son a su vez también negocios de subsistencia.

En el caso de los proveedores, dadas las dificultades de los negocios de subsistencia para acceder al crédito, separamos los proveedores financieros del resto de proveedores. Luego diferenciamos entre los proveedores mayoristas, que no suelen ser empresas de subsistencia y los minoristas, que habitualmente también son empresas de subsistencia.

Los clientes se pueden dividir según dos clasificaciones complementarias: según la cadena de valor, que pueden ser intermediarios o finales; o según sean habituales o esporádicos. Los clientes intermediarios suelen ser, a su vez, empresas de subsistencia, por lo que se incluyen en el propio estudio en las relaciones con proveedores minoristas.

A continuación, se muestra cómo tres tipos distintos de proveedores y tres tipos diferentes de clientes interactúan con los negocios de subsistencia en un mercado de bajos recursos económicos para obtener resultados financieros.

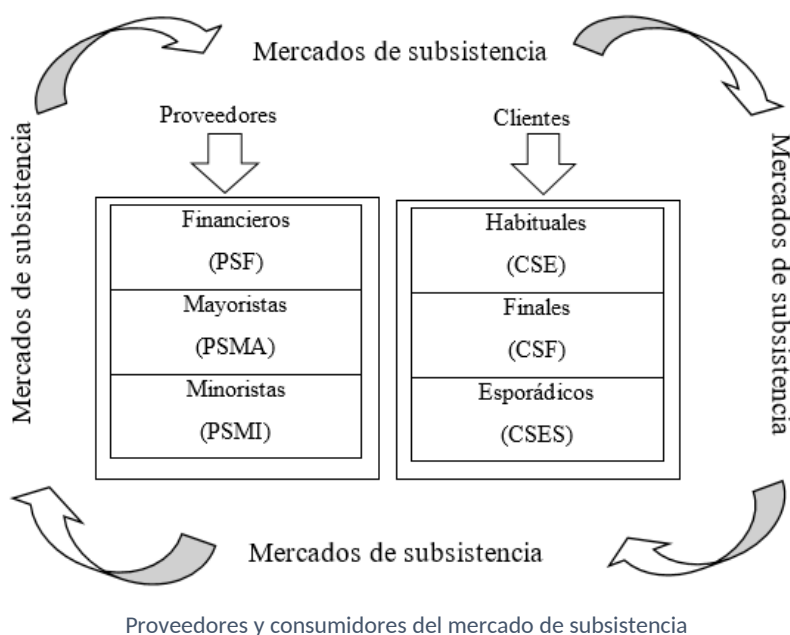


Figura 1. Proveedores y consumidores del mercado de subsistencia

Descripción de los proveedores de subsistencia

Los proveedores de subsistencia trabajan en el mercado informal y satisfacen la necesidad de los consumidores de los negocios de subsistencia en la base de la pirámide (Cieslik and D'Aoust 2018) al proveer de bienes o servicios a los negocios de subsistencia. Los proveedores de subsistencia por lo general están ubicados en las zonas rurales, y por su condición económica se ven limitados a no correr riesgos innecesarios y aseguran la elaboración de su producción de manera tradicional (Cieslik and D'Aoust 2018). La proyección de los negocios que emprendan está condicionada a un ingreso a corto plazo (London, Anupindi, and Sheth 2010) asegurando la subsistencia del hogar.

Las empresas proveedoras para mercados de subsistencia mantienen relación con las PDS y les permiten sostenerse en el mercado porque son aquellas las que brindan los bienes necesarios para que puedan generar el proceso normal durante el giro del negocio. Las mercancías ofertadas provienen de proveedores

que en gran parte compran a empresas de mayor tamaño y generan un canal de comercialización que permite llegar hasta el consumo final de los productos.

Proveedores financieros de las empresas de Subsistencia (PSF)

Los proveedores financieros de las empresas de subsistencia (PSF) trabajan en los mercados de la base la pirámide (London, Anupindi, and Sheth 2010) otorgando créditos legales a los negocios de subsistencia como apalancamiento financiero con una tasa de interés vigente para créditos micro-empresariales.

La relación con los proveedores financieros es con fines de crédito en un momento dado para apalancar una inversión o cubrir otros pagos relacionados o no al giro del negocio que es la subsistencia de la familia. Los proveedores financieros son los bancos y cooperativas que sirven a los negocios de subsistencia.

Los bancos requieren información financiera cuantitativa y subjetiva. La información cuantitativa corresponde a balances financieros, registros contables, pagos, plan de la empresa, deudas y reconocimiento de marca del negocio (Cucculelli, Peruzzi, and Zazzaro 2019), es decir, aquellos documentos que logren reflejar la salud financiera de los negocios de subsistencia. La información subjetiva está relacionada con la actitud del propietario en actividades anteriores con el banco en cuanto a comportamiento comercial de responsabilidad en deudas contraídas. El Banco verifica los activos que apalancen la deuda (Cucculelli, Peruzzi, and Zazzaro 2019) con tasas menores de interés y procede al crédito.

Los negocios de subsistencia no suelen tener toda esa documentación o bien la tienen de manera informal, por lo que les es difícil obtener créditos bancarios. Consecuentemente, suelen acudir a realizar los créditos en cooperativas que están reguladas por el sistema financiero con tasas de interés elevadas para microcréditos debido a que no tienen información financiera ni una gran cantidad de activos (London, Anupindi, and Sheth 2010) para respaldar la deuda. Las cooperativas de ahorro y crédito se limitan a solicitar la documentación con igual rigor que los bancos, aunque en la práctica son algo más flexibles en cuanto a las condiciones exigidas. Luego, proceden a aprobar el crédito en cuestión de horas o pocos días. El dinero obtenido mediante el crédito es utilizado para cubrir una necesidad urgente que beneficia a los empresarios de subsistencia a un corto plazo. El beneficio a corto se ve reflejado en el pago de mercancías a proveedores del BoP, urgencias familiares y otras deudas. El beneficio a un largo plazo no se ve por el alto costo en los intereses del crédito recibido y puede convertirse en una dificultad.

Proveedores de bienes y servicios Mayoristas (PSMA)

Los proveedores mayoristas de los negocios en los mercados de subsistencia suelen tener una gran cartera de productos, que son de venta regular, para ser comercializado los mercados de la base de la pirámide (London, Anupindi, and Sheth 2010). Además, ofertan sus productos a empresas con mayor poder adquisitivo, que suelen presentar una estructura organizativa formal, planes de negocio, estados financieros y proyección a largo plazo (Cucculelli, Peruzzi, and Zazzaro 2019).

La relación del PSMA con los negocios de subsistencia se basa en factores como crédito, productos e imagen. El crédito es un impulsor para los negocios de subsistencia mediante la interacción entre el propietario y vendedor como representante del PSMA. Los vendedores basan el crédito en su criterio de experiencia subjetivo, objetivo y trayectoria. El criterio subjetivo es la impresión que tiene el vendedor sobre el propietario en la primera visita y permite una relación basada en crédito. La impresión cuantitativa se da cuando el vendedor observa el local y estima un cupo de crédito máximo anteponiendo tres compras en efectivo contra entrega. El futuro crédito tiene una duración relativa de 8 días a 15 días. Los precios se otorgan con descuento dependiendo de la promoción y condiciones que oferte el vendedor en el momento del acuerdo. La trayectoria de la empresa se basa en el tiempo que lleva en el mercado, además referencias de compra en efectivos realizados en ocasiones anteriores a otras PSMA.

Los productos ofertados por la PSMA, está basada en marca y cantidad. La marca condiciona la compra debido a que los propietarios de los negocios de subsistencia conocen a sus clientes en gustos y capacidad de pago para adquirir los productos. La cantidad se relaciona al número de unidades de un producto particular que puede ser adquirido por la PDS, debido al limitante financiero.

La imagen y reputación que tienen los negocios de subsistencia por trayectoria y responsabilidad le permite a la PSMA otorgarles créditos con menores riesgos por la responsabilidad de los propietarios al comercializar.

Estas características hacen posible las relaciones comerciales de mutuo beneficio en el BoP, permitiendo que los negocios puedan subsistir sirviendo a los consumidores de la base de la pirámide (London, Anupindi, and Sheth 2010).

Proveedores minoristas en mercados de subsistencia (PSMI)

La economía en los hogares de países en vías de desarrollo en gran parte son de bajos recursos económicos. Los hogares rurales basados en esta limitante además de ser consumidores buscan nuevas estrategias de emprendimiento y participan en los mercados de subsistencia con la elaboración y venta de alimentos artesanales y servicios (Cieslik and D'Aoust 2018) y abastecer a los negocios de subsistencia.

Geográficamente en la zona rural se localizan los agricultores que participan como proveedores de bienes y servicios a los negocios de subsistencia, siendo reconocidos cada vez más como empresarios (Cieslik and D'Aoust 2018) en las base de la pirámide (London, Anupindi, and Sheth 2010). Los proveedores minoristas de subsistencia (PSMI) son aquellos que únicamente trabajan dentro de los mercados de las base la pirámide (London, Anupindi, and Sheth 2010) y que proveen a la PDS de productos de la agricultura o fruto del trabajo artesanal, productos de uso común que pueden solo encontrarse en la zona de desarrollo de la empresa y son altamente demandadas por los clientes y juegan un papel importante en el modelo y giro de negocio en los negocios del BoP.

La relación de los negocios de subsistencia con los PSMI es comercial y se basa en el crédito, confianza e imagen. Se establecen relaciones comerciales basadas en el crédito de días o semanas. Ofrecen créditos al PSMI debido a la relación personal con propietario. Los negocios logran hacerse de una imagen con decisiones en firme y acertadas en escoger bien a los a los PSMI que en cada caso les entregaran crédito que serán bien apreciados y retribuidos con la compra del producto por parte del cliente. Así se convierte en un agente económico de importancia para el buen desempeño de los negocios de subsistencia.

Descripción de los consumidores de subsistencia

Investigaciones previas sobre los mercados de subsistencia y consumidores han sido abordadas para comprensión y avance en el entendimiento en estos mercados. Líneas de investigación como (Chikweche and Fletcher 2010; London, Anupindi, and Sheth 2010; Sridharan and Viswanathan 2008) en la que avanzan ampliamente sobre este tema. En las investigaciones se menciona que los consumidores de los mercados de subsistencia basan su compra maximizando la utilidad al fijarse en calidad, precio y modo de uso ajustando a las normas de los grupos y limitados por sus ingresos (Chikweche and Fletcher 2010). El consumo de este segmento se afecta debido a factores políticos, inflación, corrupción y falta de empleo (Chikweche and Fletcher 2010) y condicionan la compra afectando a los negocios de subsistencia que dependen de estos ingresos para mantener su hogar (Sridharan and Viswanathan 2008).

Consumidores habituales de subsistencia empresarial (CSE)

Los consumidores habituales de subsistencia empresarial (CSE) se encuentran en la zona de influencia de los negocios de subsistencia ubicados en la base de la pirámide. Además poseen una baja capacidad de compra y de pago (London, Anupindi, and Sheth 2010) que les permite adquirir productos en pequeñas cantidades para ser usados como materia prima y elaborar artesanalmente otros productos de consumo final en el mercado del BoP y subsistir mediante la venta ambulante e informal (London, Anupindi, and Sheth 2010). Son clientes permanentes que tienen a los negocios de subsistencia como “proveedores” particulares.

La relación existente entre los CSE y los negocios de subsistencia es de tipo comercial. La interacción está basada en el crédito debido a la confianza y relación existente entre el propietario y el CSE. La confianza, que es la norma que causa la interacción entre los agentes, es un concepto medular en la creación de las relaciones comerciales (Hallam, Dorantes Dosamantes, and Zanella 2018). El crédito tiene tiempos, limitantes y un acuerdo final al que lleguen los interesados. Los tiempos son a corto plazo que no va más allá de un día o semanas debido a que los dos dependen de las ventas para soportar gastos familiares. Las limitantes tienen que ver con la cantidad, calidad y precio de los bienes en los negocios de subsistencia y deben ser adquiridos por los CSE para cubrir su necesidad. El acuerdo corresponde a la forma de pago que es en efectivo y la fecha en la que se pagarán de los bienes adquiridos.

Consumidores de subsistencia final (CSF)

Los consumidores de subsistencia final (CSF) tienen la preocupación principal de cubrir sus necesidades fisiológicas principales como objetivo principal (Chikweche & Fletcher, 2010). Además, los CSF basan su relación con los negocios de subsistencia en la base de la pirámide en los mercados de subsistencia (London, Anupindi, and Sheth 2010) en características que no solo tienen que ver con el precio (Chikweche and Fletcher 2010). Los CSF ven limitado su consumo al ingreso económico familiar que perciben por lo que reduce la capacidad de compra.

La relación es únicamente de consumo y suele basarse además en la imagen de la PDS. La compra puede darse de dos maneras, el crédito o pago a la vista. El crédito suele ser para dos semanas o máximo 4 semanas considerando al acuerdo que lleguen con el propietario. El pago a la vista se realiza en efectivo con una compra mínima y en unidades. El consumo en los negocios de subsistencia por los CSF en mínimas cantidades en los mercados del BoP puede condicionarse muchas veces a la imagen del negocio de subsistencia. La imagen del CSF esta medida por la calidad de productos, precio y bienes que obtiene al comprar a los productores del BoP (Chikweche and Fletcher 2010).

Otros consumidores de subsistencia esporádicos (CSES)

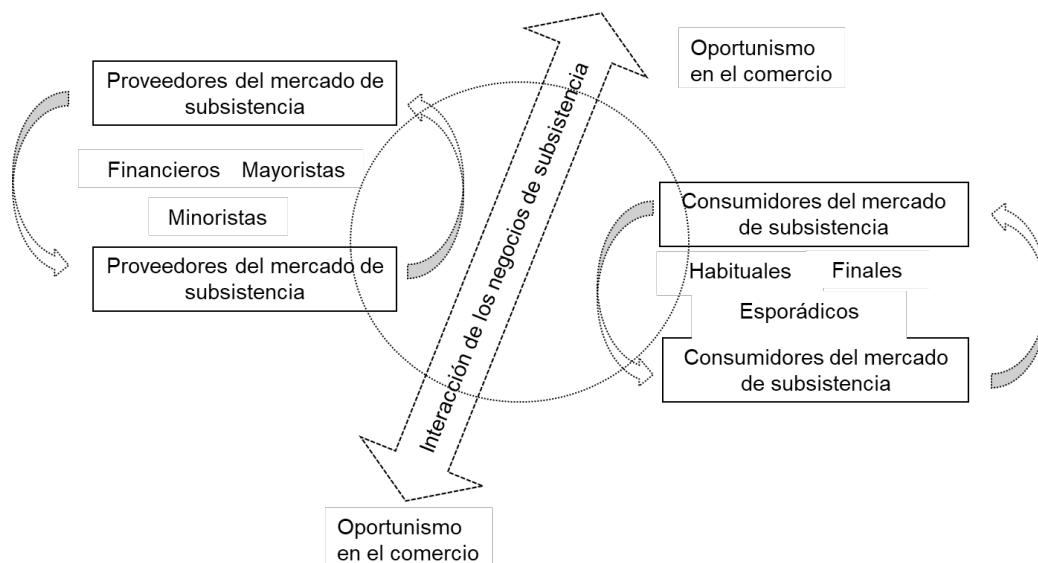
Los consumidores de subsistencia esporádicos (CSES) están ubicados en los mercados de subsistencia y tienen mayor capacidad de adquisitiva que los clientes de subsistencia final. Están interesados únicamente en adquirir un producto para su consumo en un tiempo determinado y basan su compra en la necesidad inmediata para cubrir una necesidad específica. Los CSES por su condición de eventualidad no esperan

que los negocios de subsistencia superen sus expectativas en la compra, ya que pasan por casualidad al no ser clientes frecuentes. La relación de los negocios de subsistencia con los CSES está basada en la aleatoriedad. La venta es aleatoria porque existe una oportunidad de comprar y vender como resultado del momento.

El funcionamiento del mercado

Los mercados de subsistencia ubicados geográficamente en zonas rurales y urbanas crean una cultura particular (Viswanathan et al. 2019) para comercializar y alcanzar beneficios económicos a corto plazo. La investigación utilizó la cultura organizacional de la empresa, medido por las cifras del capital estructural como variable de control. (Tengo que poner autor en donde indique q así se puede medir).

El cuadro 2 ayuda a esclarecer las relaciones comerciales de los negocios de subsistencia de La Maná. Los negocios están compuestos por relaciones y redes de contacto en cantidades suficientes entre los propietarios, proveedores y consumidores (Sridharan and Viswanathan 2008); en general, las interacciones de los negocios de subsistencia.



Modelo de la interacción comercial en los negocios de subsistencia del cantón La Maná.

Figura 2. Modelo de la interacción comercial en los negocios de subsistencia del cantón La Maná.

2.2. EL OPORTUNISMO, CULTURA EMPRESARIAL Y LAS RELACIONES COMERCIALES

En países en vías de desarrollo los negocios deben buscar nuevas estrategias ante la competencia y la falta de recursos económicos para lograr la supervivencia. Muchos fenómenos que ocurren en una organización se derivan de su cultura, que es como un código genético para conocer una organización (Chiavenato and Guzmán Brito 2009). Cada empresa tiene su cultura y ambiente de cambio permanente: un entorno imprevisible le pone constantemente a las personas en situaciones nuevas que exigen habilidades diferentes (Chiavenato and Guzmán Brito 2009). Los negocios de subsistencia se enfrentan a situaciones de riesgo (Sridharan and Viswanathan 2008) de manera constante y les exige comportamientos que les permitan alcanzar el objetivo para el cual fueron creadas.

El oportunismo es definido como una pesquisa del interés individual y universal en las relaciones. El oportunismo incluye evitar los deberes, viciar la información, romper promesas y no cumplir con las obligaciones. Además, los negocios tienen un comportamiento oportunista porque persiguen intereses a corto plazo (Zeng et al. 2017).

Cuando las personas se unen a una organización y crean relaciones comerciales traen consigo valores y creencias aprendidas (Luthans, Luthans, and Luthans 2015) sin embargo, estos valores y creencias son insuficientes para ayudar al éxito individual en la organización y crear competitividad (Luthans, Luthans, and Luthans 2015). Una buena parte de los problemas en una empresa se deben a su cultura organizacional (Gutiérrez Pulido 2010), es así que al no haber relaciones existentes positivas que generen cultura empresarial no será fuente de ventajas competitiva que genere beneficios y rendimientos financieros.

Las empresas cuando son capaces de escuchar las necesidades del cliente acumulan un profundo conocimiento de sus mercados, esto les permite proporcionar un producto esperado por el cliente pero también un buen servicio, tanto durante y después de la venta, por lo que se espera que sean compensado por una mayor fidelidad y satisfacción del cliente (Agostini, Nosella, and Soranzo 2017), es así que un impulsor como la iniciativa de decisión del empresario plantea la forma en la que los líderes definen un

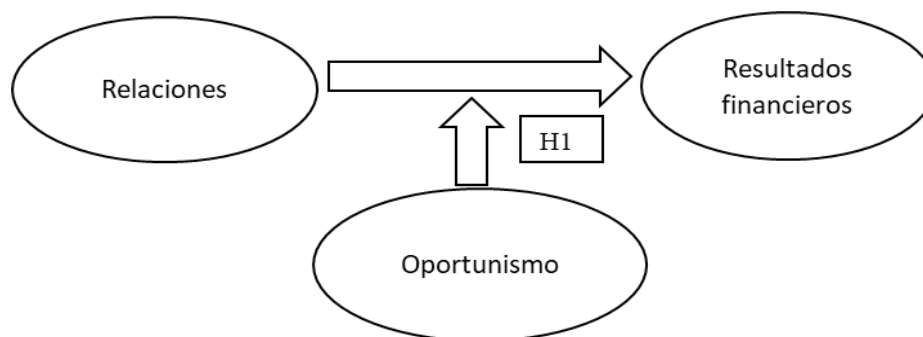
rumbo, asumen los retos que el entorno presenta a su organización y la manera cómo establecen estrategias innovadoras para responder al mismo con una ejecución centrada en prioridades (Gutiérrez Pulido 2010).

Las relaciones comerciales en los negocios de subsistencia están compuestos por valores creados por propietarios de los negocios, basados en las relaciones que se establecen durante la actividad comercial con los agentes de interacción económica, es decir, es el elemento más importante de las relaciones comerciales (Walecka 2018) para los negocios de subsistencia. Además, la cultura del empresario puede convertirse en un elemento facilitador de la estrategia o en una fuerza restrictiva si no se identifican sus elementos clave ni se desarrollan las capacidades y competencias necesarias (Gutiérrez Pulido 2010).

Según (Dabić et al. 2018) en su estudio lo que demuestra es que el clima organizacional como resultante de una cultura organizacional no es particularmente crucial para el éxito empresarial.

En la investigación de (Heilbrunn 2005) se proporciona una investigación sobre la influencia del cambio organizacional en el volumen de la actividad empresarial en entornos comunitarios, lo que sugieren que las variables como la cultura y estrategia ya no son relevantes para la iniciativa empresarial, sino, además, cuestiones como el empresario, características demográficas, la relación entre el empresario, la comunidad, la creación de redes, capital social en el individuo y el nivel de la comunidad, pueden proporcionar un posible marco explicativo para la comprensión de la actividad empresarial. De ahí nuestra tercera hipótesis.

H1: El oportunismo de los empresarios en los negocios de subsistencia condiciona las relaciones con los agentes de interacción económica afectando los resultados financieros.



Efecto sobre los resultados financieros

Figura 3. Efecto sobre los resultados financieros

3. MATERIALES Y MÉTODOS

3.1. POBLACIÓN Y MUESTRA

El cantón de La Maná, es uno de los siete cantones de la Provincia de Cotopaxi. Tiene una superficie total de 66.258 hectáreas. La población de acuerdo al último censo realizado por el INEC (2010) alcanza los 42.216 habitantes, logrando un incremento de población en 10.101 habitantes. La tasa de crecimiento de la población del cantón La Maná, según información del SNI, SENPLADES, INEC crecerá a un ritmo del 2,99 % anual hasta el año 2020 y alcanzaría una población total para este periodo de 54.839 habitantes.

Sus inmensos bosques, sus gigantescas siembras de banano, orito, yuca, cacao, tabaco y café, y su ubicación estratégica geográfica y su riqueza aurífera le confieren características especiales que propician su desarrollo y le otorgan un papel protagónico en la economía de sus habitantes. Los productos más importantes son de carácter exportable y son el sustento de la economía del cantón convirtiéndose en el motor principal de su desarrollo económico. El cantón se caracteriza principalmente por contar con un número importante de MPYMES, en la que se puede observar una infinidad de negocios como principal ingreso para muchas familias, en su mayoría los negocios están conformados por los miembros de la familia siendo el padre o madre el propietario y gerente que toma las decisiones del negocio.

Los negocios son administrados en todas sus áreas por el propietario que cumple todo el proceso desde adquisición de producto hasta venta al público, la característica de estos negocios es la estrecha relación de confianza que tiene el propietario con el cliente que confía en la calidad y precio de los productos que le está ofreciendo el dueño del negocio, la constante necesidad de conocer estrechamente a su cliente y sus necesidades hace que obtenga productos especiales de los proveedores con precios competitivos, conocer las necesidades junto con un saludo y sonrisa amable del propietario son características intrínsecas que son valoradas por clientes que los conocen por su trayectoria en el mercado.

Según base de datos proporcionada por el Servicio de Rentas Internas (SRI) La Maná, el cantón cuenta con 2.325 microempresas comerciales activas, las mismas que se encuentran distribuidas de acuerdo a la Clasificación Industrial Internacional Uniforme (CIIU) que manejan actualmente en su mayoría las

instituciones públicas y privadas del país. Para el mejor manejo de la información se ha agrupado éstas actividades en los siguientes grupos.

Al considerar como población las 2.325 pymes de subsistencia registrados en datos del SRI y siendo una población finita se vio preciso usar el valor de fórmula para poblaciones finitas menores a 100.000 y tener una muestra representativa proporcional a la concentración de negocios, como resultado fueron 971 encuestas siendo un porcentaje de 40.55% de un total de 2325 pymes de subsistencia registradas en el cantón La Maná a las cuales se aplicó la encuesta, es por eso que a mayor número de empresas encuestadas disminuye el error de estimación para la muestra con un error de muestreo del 2.45% y con un nivel de confianza del 95% suponiendo una varianza máxima donde $p = q = 0,5$,

Para recolectar los datos se identificó las pymes de subsistencia del cantón La Maná, según la muestra obtenida por proporción de los negocios. La muestra corresponde a 971 encuestas. Este sector los negocios mantienen una dinámica constante de venta y los propietarios dominan el giro del negocio y podrán contestar al cuestionario sin problema y aportan con los datos necesarios para la investigación.

La encuesta se realizó con un grupo de encuestadores formados y liderados por entendidos en la materia que realizarían las preguntas y ventilarían al propietario cualquier inquietud o duda que apareciera referente al cuestionario durante la encuesta y evitar posibles errores de interpretación durante la encuesta para registrar las respuestas con la mayor precisión posible. El tiempo que tomo realizar la encuesta fue de 36 días, tiempo que se considerado en resolver cada uno de los ítems proporcionados en la encuesta para los propietarios de los negocios.

3.2. MEDIDAS Y DATOS

Para valorar la encuesta se realizó un enfoque de escalas para medir las actitudes mediante la escala de confianza de Likert con un conjunto de ítems de 1 hasta el 5 (Singh & Rao, 2016). Las afirmaciones inician con nada de acuerdo= 1 hasta totalmente de acuerdo= 5 para codificar las alternativas de respuesta, si la afirmación es positiva significa que califica favorablemente al objeto de estudio (Hernández et al., 2014). Los ítems del cuestionario responden a investigaciones realizadas sobre temas de capital intelectual y las variables que componen los constructos de estudio. Cada uno de los ítems que componen nuestro cuestionario es adaptado a la necesidad de nuestro estudio considerando nuestro objetivo de investigación y basados en el de (Jardon and Susana Martos 2012).

Para medir las relaciones hacemos uso de los ítems que he utilizado en la investigación:

Tabla 1. Ítems usados en la investigación

RESULTADOS FINANCIEROS		
r1	La facturación	
r3	El beneficio neto	
r4	La rentabilidad	
r5	La solvencia	
r6	El numero de empleados	
r8	la formación tecnológica de los empleados	
r9	La productividad	
r10	La modernización de las instalaciones	
r11	La capacidad de innovación	
CAPITAL RELACIONAL		
cr1	Nuestra empresa utiliza redes de colaboración para incrementar sus resultados	
cr2	Nuestra empresa colabora con instituciones del conocimiento (universidades, centros de investigación, etc...) para mejorar nuestra organización	
cr3	Nuestros Clientes están satisfechos	
cr4	Los clientes participan en la generación de nuevos productos o procesos	
cr5	Realiza habitualmente acuerdos de cooperación con clientes para mejorar sus productos / servicios	
cr6	Los proveedores participan en la generación de nuevos productos o procesos	
cr7	Realiza habitualmente acuerdos de cooperación con proveedores para mejorar sus productos / servicios	
cr8	Realiza habitualmente acuerdos de cooperación con competidores para mejorar sus productos / servicios	
CULTURA		
capces 5	Incorpora habitualmente mejoras en los productos, procesos y mejoras	
capces 6	En todos los ambitos e liste una preocupación continua por la calidad del producto o servicio	

capces 7	Su empresa busca constantemente información sobre las nuevas tecnologías que puede aplicar	
capces 11	Existe una preocupación continua por evitar la contaminación y mejorar el medioambiente	
capces 12	La continua mejora tecnológica de la empresa ayuda a generar valor	
capces 13	Existe una cultura de transmitir las experiencias a los nuevos trabajadores	
capces 14	Existe un alto grado de confianza entre las personas de la empresa	
ch 8	Existen unos valores, actitudes y comportamientos compartidos por todo el personal que facilitan el clima de trabajo	
ch 9	El personal tiene una preocupación continua por evitar la contaminación y mejorar el medioambiente	

3.3. LOS MÉTODOS ECONÓMICOS

Dado que se busca establecer constructos que recojan la información conjunta de las variables, se analizó de modo conjunto las preguntas que están relacionadas en su planteamiento, de tal forma que se obtenga su parte común mediante análisis factorial. Para construir la variable estructural que recoja la importancia del concepto que engloba múltiples facetas, se hizo uso de un análisis factorial, técnica de reducción de datos útil para encontrar grupos homogéneos de variables a partir de un conjunto numeroso de éstas. Esos grupos se forman con las variables que correlacionan mucho entre ellas y tratando que unos grupos sean independientes de otros.

Para establecer la confiabilidad del instrumento de recolección de datos, se calculó el coeficiente Alfa de (Cronbach, 1951), a través del cual se determinó la consistencia interna del cuestionario. Este método se basa en el análisis de las intercorrelaciones promedios entre los ítems referidos a un mismo aspecto, a partir de una sola administración del cuestionario. Este coeficiente produce valores que oscilan entre cero (0) y uno (1). Mientras más cerca del valor uno (1), más confiable es el instrumento. Los criterios que utilizamos para la interpretación del Coeficiente Alfa de Cronbach son los valores propuestos por (Nunnally, 1978): menores de 0,6 (baja); entre 0,61 y 0,70 (adecuada); entre 0,71 a 0,80 (buena); mayores de 0,80 (alta).

Luego, se realizó un análisis de regresión lineal múltiple entre las variables que definían los distintos componentes del capital intelectual y la variable estructural que caracteriza los resultados empresariales.

Los cálculos se hicieron mediante regresión múltiple, técnica estadística que se utiliza para analizar la relación existente entre variables. Es decir, es un procedimiento que sirve para explorar y cuantificar la relación entre una variable llamada dependiente y una o más variables llamadas independientes.

Para el proceso de análisis, depuración y tratamiento de los datos se utilizó el programa el paquete R.

4. RESULTADOS Y DEBATE

El estudio tiene como objetivo probar la hipótesis sobre el capital relacional y los rendimientos financieros basados en la cultura organizacional. Posteriormente, el modelo probó la hipótesis relacionada con el efecto moderador de la cultura organizacional.

El modelo presenta una relación: las relaciones para medir las variables latentes. En el que se introduce la interacción de la cultura organizacional como una variable de moderación.

Tabla 2. Correlaciones

Coefficients:	Estimate	Std. Error	t value	Pr(> t)
Oportunismo	-0.05792	0.02103	-2.753	0.00601 **
Relaciones	0.49153	0.04439	11.074	< 2e-16 ***
Cultura	0.33301	0.04603	7.235	9.63e-13 ***
(Intercept)	0.07767	0.02888	2.69	0.00728 **

Residual standard error: 0.6568 on 943 degrees of freedom

(33 observations deleted due to missingness)

Multiple R-squared: 0.6153, Adjusted R-squared: 0.6141

F-statistic: 502.8 on 3 and 943 DF, p-value: < 2.2e-16

La tabla muestra que las relaciones producen un impacto significativo sobre los resultados financieros. Los resultados lo confirman.

El oportunismo sin embargo produce un efecto negativo sobre el impacto que tenían las relaciones, es decir, disminuye ese efecto con un impacto negativo significativo. Esto coincide con los resultados de (Dabić et al. 2018) en el que demuestra mediante un estudio que el clima organizacional como resultante de una cultura organizacional no es particularmente crucial para el éxito empresarial.

La combinación de estas tres variables explica bien resultados financieros para estos negocios, porque es muy significativo en los resultados.

El capital relacional afecta el rendimiento financiero, pero la interacción con la cultura afecta negativamente los resultados financieros. Esto se debe al oportunismo existente en las relaciones comerciales. En los negocios de subsistencia el proceso de venta es una necesidad de supervivencia en la que los propietarios no tienen una proyección a un largo plazo (Cieslik and D'Aoust 2018).

5. CONCLUSIONES

Uno de los objetivos de esta investigación es determinar cómo los negocios de subsistencia interactúan con los agentes económicos en los mercados de subsistencia, en particular, en un cantón de la provincia de Cotopaxi llamado La Maná.

El otro objetivo consiste en verificar como el capital relacional y el oportunismo afecta directamente al rendimiento financiero, en particular, en el cantón La Maná.

Los hallazgos demuestran un oportunismo en los negocios de subsistencia. El oportunismo sin embargo produce un efecto negativo sobre el impacto que tenían las relaciones, es decir, disminuye ese efecto con un impacto negativo significativo, Esto podría deberse a que la venta es una necesidad de supervivencia a corto plazo y sin proyectarse a un largo plazo (Cieslik and D'Aoust 2018) en el crecimiento de la empresa.

REFERENCIAS

- AGOSTINI, LARA, ANNA NOSELLA, AND BENEDETTA SORANZO. 2017. "Measuring the Impact of Relational Capital on Customer Performance in the SME B2B Sector." *Business Process Management Journal* 23 (6): 1144–66. <https://doi.org/10.1108/BPMJ-10-2016-0205>.
- CHIAVENATO, IDALBERTO, AND MARTHA PATRICIA. GUZMÁN BRITO. 2009. *Comportamiento Organizacional: La Dinámica Del Éxito En Las Organizaciones*. McGraw Hill.
- CHIKWECHÉ, TENDAI, AND RICHARD FLETCHER. 2010. "Understanding Factors That Influence Purchases in Subsistence Markets." *Journal of Business Research* 63 (6): 643–50. <https://doi.org/10.1016/j.jbusres.2009.04.024>.
- CIESLIK, KATARZYNA, AND OLIVIA D'AOUST. 2018. "Risky Business? Rural Entrepreneurship in Subsistence Markets: Evidence from Burundi." *The European Journal of Development Research* 30 (4): 693–717. <https://doi.org/10.1057/s41287-017-0100-9>.
- CUCCULELLI, MARCO, VALENTINA PERUZZI, AND ALBERTO ZAZZARO. 2019. "Relational Capital in Lending Relationships: Evidence from European Family Firms." *Small Business Economics* 52 (1): 277–301. <https://doi.org/10.1007/s11187-018-0019-3>.
- DABIĆ, MARINA, JASMINKA LAŽNJAK, DAVID SMALLBONE, AND JADRANKA ŠVARC. 2018. "Intellectual Capital, Organisational Climate, Innovation Culture, and SME Performance." *Journal of Small Business and Enterprise Development*, October, JSBED-04-2018-0117. <https://doi.org/10.1108/JSBED-04-2018-0117>.
- FERNÁNDEZ-JARDÓN, CARLOS MARÍA, AND MARÍA SUSANA MARTOS. 2016. "Capital Intelectual y Ventajas Competitivas En Pymes Basadas En Recursos Naturales de Latinoamérica." *Revista Innovar Journal Revista de Ciencias Administrativas y Sociales* 26 (60): 117–32. <https://doi.org/10.15446/innovar.v26n60.55548>.
- Gutiérrez Pulido, Humberto. 2010. *Calidad Total y Productividad*. 3a ed. México: McGraw Hill.
- HALLAM, CORY, CARLOS ALBERTO DORANTES DOSAMANTES, AND GIANLUCA ZANELLA. 2018. "Culture and Social Capital Network Effects on the Survival and Performance of High-Tech Micro and Small Firms." *Journal of Small Business and Enterprise Development* 25 (1): 81–106. <https://doi.org/10.1108/JSBED-05-2017-0161>.
- HEILBRUNN, SIBYLLE. 2005. "The Impact of Organizational Change on Entrepreneurship in Community Settings." *Journal of Small Business and Enterprise Development* 12 (3): 422–36. <https://doi.org/10.1108/14626000510612321>.
- HORMIGA, ESTHER, ROSA BATISTA, AND AGISTÍN SANCHEZ. 2007. "La Influencia Del Capital Relacional En El Éxito de Las Empresas de Nueva Creación." *Conocimiento, Innovación y Emprendedores: Camino Al Futuro, 2007*, ISBN 84-690-3573-8, 89. <https://dialnet.unirioja.es/servlet/articulo?codigo=2233480>.
- JARDON, CARLOS M., AND MARIA SUSANA MARTOS. 2012. "Intellectual Capital as Competitive Advantage in Emerging Clusters in Latin America." *Journal of Intellectual Capital* 13 (4): 462–81. <https://doi.org/10.1108/14691931211276098>.
- LINDEMAN, SARA. 2012. "Market Formation in Subsistence Contexts: A Study of Informal Waste Trade Practices in Tanzania and Brazil." *Consumption Markets & Culture* 15 (2): 235–57. <https://doi.org/10.1080/10253866.2012.654962>.
- LONDON, TED, RAVI ANUPINDI, AND SATEEN SHETH. 2010. "Creating Mutual Value: Lessons Learned from Ventures Serving Base of the Pyramid Producers." *Journal of Business Research* 63 (6): 582–94.

<https://doi.org/10.1016/j.jbusres.2009.04.025>.

LUTHANS, FRED, BRETT C. LUTHANS, AND KYLE W. LUTHANS. 2015. *Organizational Behavior: An Evidence-Based Approach*. Thirteenth. Charlotte, North Carolina.

SRIDHARAN, SRINIVAS, ELLIOT MALTZ, MADHUBALAN VISWANATHAN, AND SAMIR GUPTA. 2014. "Transformative Subsistence Entrepreneurship." *Journal of Macromarketing* 34 (4): 486–504. <https://doi.org/10.1177/0276146714529659>.

SRIDHARAN, SRINIVAS, AND MADHU VISWANATHAN. 2008. "Marketing in Subsistence Marketplaces: Consumption and Entrepreneurship in a South Indian Context." Edited by Dennis Pitta. *Journal of Consumer Marketing* 25 (7): 455–62. <https://doi.org/10.1108/07363760810915671>.

VARGAS-HERNÁNDEZ, JOSÉ G.1, RAFAEL2 CASAS CÁRDENAZ, AND PATRICIA2 CALDERÓN CAMPOS. 2016. "Internal Control and Organizational Culture in Small Businesses, A Conjunct...: EBSCOhost." *Journal of Organisational Studies & Innovation* 3 (2): 16–30.

VISWANATHAN, MADHU, RAED ELAYDI, ROLAND GAU, AND LISA JONES CHRISTENSEN. 2019. "Subsistence Marketplaces: Challenges and Opportunities." *Journal of Public Policy & Marketing* 38 (1): 36–41. <https://doi.org/10.1177/0743915618820972>.

WALECKA, ANNA. 2018. "Analysis of the Relationship between the Enterprise and the Environment in the Context of Managing the Relational Capital." *Management* 22 (2): 25–41. <https://doi.org/10.2478/manment-2018-0021>.

ZENG, FUE, YUNJIA CHI, MAGGIE CHUOYAN DONG, AND JING HUANG. 2017. "The Dyadic Structure of Exchange Partners' Governing-Agency Social Capital and Opportunism in Buyer–supplier Relationships." *Journal of Business Research* 78 (September): 294–302. <https://doi.org/10.1016/j.jbusres.2016.12.025>.

DESTILADO DE AGAVE EN EL SUR DEL ESTADO DE MÉXICO: CONDICIONES DE PRODUCCIÓN Y COMERCIALIZACIÓN QUE INCIDEN EN EL CONSUMO

WENDY ELIZABETH GARCÉS ESTRADA

Centro Universitario UAEM Tenancingo/Universidad Autónoma del Estado de México
Carretera Tenancingo-Villa Guerrero km 1.5, Tenancingo, Estado de México, México

JESICA ALEJANDRA AVITIA RODRIGUEZ

Centro Universitario UAEM Tenancingo/Universidad Autónoma del Estado de México
Carretera Tenancingo-Villa Guerrero km 1.5, Tenancingo, Estado de México, México

JAVIER JESÚS RAMÍREZ HERNÁNDEZ

Centro de Estudios e Investigación en Desarrollo Sustentable/Universidad Autónoma del Estado de México
Toluca, Estado de México, México

e-mail Wendy Elizabeth Garcés: wendy_liz_1994@hotmail.com

Resumen

En el Estado de México, la destilación de agave se caracteriza por tener una producción artesanal en pequeña escala y de traspatio, además, no existe regulación suficiente de su producción y comercialización, en tanto, el consumo se realiza en las comunidades cercanas principalmente. El objetivo de la investigación es identificar las condiciones de producción del destilado de agave y como inciden en los procesos de elección del consumidor en el sur del Estado de México. El referente teórico consiste en el estudio de la estructura organizativa y el funcionamiento de las unidades productivas, además, el conjunto de factores que inciden en la elección del consumidor ya sea por factores cognitivos (desarrollo de estructuras mentales y procesos de pensamiento) o factores del entorno (características sensoriales, factores sociales y medioambiente). La metodología consiste en realizar observación no participativa, esto permite la identificación de las condiciones de producción y comercialización del destilado de agave en las comunidades de los municipios de Malinalco y Zumpahuacán así como su consumo. Los resultados muestran el proceso de producción exhibe desorganización en cada etapa, no hay controles adecuados de manejo, por ejemplo, hay condiciones insalubres, el envasado del producto en botellas recicladas sin etiqueta. La comercialización se destina al mercado local, la venta es a granel en contenedores de plástico, son volúmenes pequeños que no cubren la demanda, no hay regulación fiscal y se presenta la reventa. Se añade la problemática del retiro de la denominación de origen del mezcal en el Estado de México en 2018. El consumo se presenta por aspectos culturales (tradiciones y costumbres ancestrales), tienen todavía un carácter simbólico. En conclusión, las problemáticas en la producción y comercialización del destilado agave son factores del entorno que forman parte de los procesos de elección del consumidor, dicho consumo tiene rasgos diferentes al que muestra un consumo en zonas urbanas.

Palabras clave: Destilado de agave, Elección del consumidor, Condiciones de producción y comercialización, México.

Área o eje Temático 2: Economía Nacional, Regional y Local

Abstract

In the State of Mexico, the distillation of the agave It is characterized by having a handicraft production on a small-scale and backyard, in addition, there is not sufficient regulation of their production and marketing, meanwhile, consumption is carried out in nearby communities, mainly. The aim of the research is identifying the production conditions of the agave distillate and how they affect the election processes of the consumer in the south of the state of Mexico. The theoretical reference consists in the study of the organizational structure and the functioning of the productive units, also, the set of factors that affect the consumer's choice, either by cognitive factors (development of mental structures and thought processes) or environmental factors (sensory characteristics, social factors and environment. The methodology consists in non-participatory observation, this allows identification the conditions of production and marketing of agave distillate in the communities of the municipalities of Malinalco and Zunpahuacan municipalities, as well as its consumption. The results show that the production process

exhibits disorganization at each stage, there are no proper management controls, such as, unhealthy conditions, packaging the product in recycled bottles unlabeled. The commercialization is just for the local market, selling it in bulk in plastic containers, they are small volumes that do not cover demand, there is no fiscal regulation and the resale is presented. In addition to the problematic the denomination of origin of mezcal in the State of Mexico in 2018 is added. Consumption is presented by cultural aspects (ancestral traditions and customs), still has a symbolic character. In conclusion, the problems in the production and marketing of agave distillate are factors of the environment that are part of the processes of consumer choice, that consumption is different to that shown in urban areas consumption.

Key Words: Distillation of the agave, consumer's choice, conditions of production, marketing, Mexico.

1. INTRODUCCIÓN

México cuenta con una amplia variedad de productos destilados, dichos productos tradicionales reflejan profundos elementos culturales propios de las regiones de elaboración, a ser solamente productos de consumo, y además son muestras de la biodiversidad alimentaria que el medio geográfico natural ofrece de los habitantes de una región, uno de estos productos típicos y tradicionales de México es el mezcal, esta bebida es caracterizada por ser producida de manera familiar dentro de comunidades rurales, generando ingresos complementarios.

Localmente se conoce como “mezcal”, a la bebida destilada de agave, es un nombre genérico que se encuentra distribuido por la República Mexicana. El mezcal es una de las bebidas más representativas de México, su relevancia cultural está en función del arraigo en las comunidades, su aporte gastronómico, y su uso tradicional en las fiestas familiares, patronales y funerarias. Con la asignación de la Denominación de origen del “mezcal” en 1994 los Estados excluidos de la misma no tienen permitido etiquetar o comercializar su producto bajo el nombre de mezcal.

Las regiones productoras de mezcal (destilados de agave) que no son reconocidos dentro de la normativa Denominación de Origen Mezcal (DOM) son desplazados a mercados informales. Algunos Estados han cambiado el nombre a destilado de agave, u otro nombre, el cual no cuentan con el reconocimiento aun cuando se elaboren con las mismos procesos y variedades de agave o maguey (nombre de la planta de la cual se obtiene el mezcal e identificado en las comunidades rurales). Lo que dificultara su adecuada comercialización y venta.

Se considera que el Estado de México ha basado su comercio de mezcal en la informalidad debido a que los productores no pueden registrar la marca como “mezcal” y se ven obligados a distribuirlo como destilado de agave o maguey. La producción de destilado de agave en la zona es artesanal y es una actividad económica complementaria para los productores, debido a que se dedican a la siembra y comercialización de fruta de temporada, lo que repercute en su disponibilidad. La venta a granel y en botellas recicladas es común en la zona, lo que causa desconfianza en los consumidores externos que lo pueden clasificar como adulterado o poco salubre. Otro factor que limita la venta es la disponibilidad del producto debido a que no se encuentra con el volumen de producción para llegar a establecerse en tiendas de conveniencia.

Por tanto, el objetivo de esta investigación identificar las condiciones de producción y comercialización del destilado de agave y como inciden en los procesos de elección del consumidor en el sur del Estado de México.

2. ANTECEDENTES

La demanda de bebidas alcohólicas en México está liderada por el consumo de cerveza que representa un 66.5% (Seale & Associates, 2018) de la participación de mercado; los destilados, se dividen en Tequila, Mezcal, Vodka, Brandy, entre otros y representan el 25.8%, el vino por otra parte representa un 6.1% y el 1.6 restante es de otros tipos de bebidas alcohólicas.

El estudio de “Principales tendencias de consumo de bebidas alcohólicas en México, 2017” (Grupo Imagen, 2017) establece que la cerveza es la bebida número uno con 51.2%, seguida del tequila, que es el destilado más consumido con un 23.4%, el mezcal representa un 4.8%. Por la distribución geográfica la región del valle de México concentra la comercialización de mezcal con un 46.66%, la zona de occidente (Jalisco, Michoacán, Colima, Guanajuato y Aguascalientes) tienden a comercializar el 14.31% y el sureste cuenta con el 12.79% (ISCAM, 2015).

Entre los hábitos de los consumidores de destilados de agave resalta la identidad de cultura y el conocimiento que las personas tienen sobre la bebida. De acuerdo con CRM (2017) el mercado tiene una preferencia por mezcales jóvenes que representa el 82.6% del consumo y Oaxaca produce el 87% de mezcal que se consumen a nivel nacional, no es de extrañar que el mezcal oaxaqueño cuente con la mayor presencia en el mercado.

Los agaves son considerados una especie endémica de México, debido a que, de las 285 especies en el mundo, en México se encuentran distribuidas 200 especies (CONABIO, 2012). En las comunidades de México el término agave es conocido como maguey, el cual se ha utilizado a través de los años como: alimento, planta medicinal, uso textil, extrayendo el ixtle (fibras de las hojas del agave), para morrales, cordeles y costales. Se estima que se emplean 39 especies de agave para preparar distintas bebidas alcohólicas y en 21 estados de la República Mexicana se realiza el proceso de destilado de agave (García, 2010).

Las bebidas extraídas del agave son variadas y se encuentran distribuidas en todo México, se utilizan diferentes materiales y métodos para elaborarlas, sus características y exquisitez organolépticas son logradas a través de la diversidad de los agaves, el proceso de fermentación y destilación, que aporta rasgos que lo diferencia de

otros destilados. Son variantes del destilado de agave el comiteco de Chiapas, la bacanora de Sonora, la raicilla y la barranca de Jalisco y Nayarit, la tuxca o quitupán de Colima, el tequila y el mezcal. (Salas, 2015).

Entre las especificaciones de la NOM de mezcal se encuentran las “Clases de Mezcal” las cuales han evolucionado y se han adaptado al entorno y comercialización, por lo que el mezcal bajo esta clasificación puede ser: Blanco o Joven, Madurado en vidrio, Reposado, Añejo, Abocado y Destilado

La palabra mezcal tiene su origen en vocablos de la lengua náhuatl; que deriva de mexcalli, que significa “maguey cocido”. Durante la época prehispánica se consideraba un elixir para rendir culto a los dioses, eran usados en rituales, y eran consumidos por la realeza y las órdenes religiosas. Posteriormente el mezcal fue considerado como una bebida de jornaleros y de las clases más bajas generando una disminución en el consumo debido a esta reputación. Con la crisis tequilera por la escasez de agave y la consecuente adulteración de los tequilas con azúcares de caña en el 2000, el tequila perdió prestigio y el mezcal comenzó a ganar importancia en el mercado por sus diferentes características organolépticas y ancestrales. Posicionándose como una bebida aristocrática que se sirve hasta en las mejores mesas. Las distintas clases de mezcal dependen del tipo de maguey, del clima, de la técnica de destilación y del recipiente donde se le deja reposar (Salas, 2015).

Las diferencias organolépticas que posee cada clase de mezcal están determinadas por tres aspectos, el primero es la especie, variedad y procedencia del agave usado, segundo, el de la región de procedencia, debido a esto el mezcal puede tener sabores dulces o amargos, que se conforma de acuerdo con elementos diversos y el tercero, las prácticas culturales y tecnologías empleadas en la elaboración de este.

La cultura esta estimulada por las relaciones humanas que trascienden en el tiempo, permitiendo conservar, reproducir, y crear nuevos conocimientos y valores para la transformación del medio social. La familia influye de manera significativa en el comportamiento de los individuos. El individuo responde a estímulos e interactúa con la sociedad a través de imitar los patrones que adapta de su familia. Estos patrones de comportamiento tienen como sostén fundamental la satisfacción, cubrir necesidades y la preservación de la identidad.

La cultura, la etnia y la clase social son influencias externas que contribuyen para explicar la manera de comportarse de los consumidores. Los elementos abstractos o comportamientos mentales son constituidos por valores. Los valores culturales son profundamente arraigados en las sociedades. Las normas, rituales y símbolos son elementos físicos o también llamados de artefactos culturales que incluyen cosas como libros, computadores y/o productos específicos, también pueden representar símbolos y significados, como la comida típica nacional (Blackwell, et al., 2005).

La histórica y cultural del mezcal proviene de los usos que se da al maguey o agave, el cual ha sido preservado por las comunidades indígenas y las poblaciones campesinas de México, quienes destacan en la producción de mezcal conservar las formas tradicionales de su elaboración y el consumo en los momentos significativos de su vida comunitaria. Culturalmente el mezcal es una bebida que se encuentra arraigada en México, debido a que es un legado heredado desde los primeros habitantes y a través de los años se ha modificado en función de la zona geográfica y época. Alrededor del mezcal se han creado leyendas, tradiciones y saberes milenarias que forman parte de la identidad de los habitantes donde se elabora la bebida (García, 2016).

2.1. DENOMINACIÓN DE ORIGEN MEZCAL

Se entiende por denominación de origen el nombre de una región geográfica del país que sirva para designar un producto originario de la misma y cuya calidad y características se deban exclusivamente al medio geográfico, comprendiendo en éste los factores naturales y humanos. México cuenta con 16 denominaciones de origen (IMPI, 2018). En el sector de bebidas se encuentran: tequila, mezcal, bacanora, sotol y charanda.

El uso de la denominación de origen tiene la finalidad de ayudar a la comunidad que lo ostenta, en el caso de las denominaciones en México tienen un carácter restrictivo. En el caso del Mezcal, tiene un impacto que podría generar la desaparición del proceso de producción artesanal, que no considera la importancia y relación del mezcal con la comunidad que desarrolla esta actividad. Lo que lleva a indagar si los fundamentos sobre los que se construye el concepto “Denominación de Origen” (DO), fueron la base para la construcción de la DOM, tanto para el beneficio de los productores como para los consumidores (García, 2010).

Con la asignación de la DOM se planteó aprovechar las características rustico-artesanal de la bebida para fortalecerla, preservando las tradiciones de saberes y como patrimonio cultura. La estrategia se enfoca en resaltar su valor artesanal para generar valor agregado y reconocimiento al producto mezcal. La DOM es exclusiva a 9 Estados, (Oaxaca, Puebla, Zacatecas, Guerrero, Durango, Guanajuato, San Luis Potosí, Michoacán y Tamaulipas). Los estados que no se encuentran bajo la protección de la DOM, con respecto al marco jurídico regulador de la producción y comercialización del mezcal es ilegal la utilización del nombre mezcal, por lo cual se le asigna otro nombre a su producto, siendo destilado de agave él genérico. Se excluyen

muchas zonas mezcaleras tradicionales e incluye otras no mezcaleras, provocando que en un futuro puedan desaparecer. Cabe mencionar que este tipo de destilado en las comunidades representa su identidad cultural, tradiciones y forma de generar ingresos con la elaboración de “su mezcal”.

2.2. EL “MEZCAL” EN EL ESTADO DE MÉXICO

En el Estado de México se tiene identificada la franja mezcalera que abarca los municipios de Zacualpan, Malinalco, Ocuilán, Zumpahuacán, Tonalico e Ixtapan de la Sal donde sobreviven algunos alambiques tradicionales (Onsaya, 2015). La destilación de agave en el Estado de México se caracteriza por tener una producción artesanal en pequeña escala y de traspatio, por lo que el consumo se realiza en las comunidades cercanas a su producción. Además, no existe regulación suficiente de su producción y comercialización

La zona sur del Estado de México ha tenido incertidumbre con respecto al termino legal de “mezcal” debido a que, en agosto de 2018, el Instituto Mexicano de la Propiedad Intelectual (IMPI) había incluido al Estado de México en la lista de Estados permitidos a ostentar la denominación de origen “mezcal”. Por otra parte, el Consejo Regulador del Mezcal (CRM) rechazo la ampliación de la denominación para el Estado de México, Morelos y Aguascalientes el 17 de diciembre de 2018. Por ello el termino mezcal es de uso exclusivo para los estados pertenecientes a la DOM en México.

En el Estado de México, se comenzaron estrategias de producción y comercialización de mezcal como una fuente de ingresos. A pesar de que la actividad se encuentra a pequeña escala, el gobierno estatal ha promovido el crecimiento de la industria mezcalera (DOF, 2018), dotándolo de recursos vegetales. Por otro lado, los pequeños productores están creando asociaciones con la finalidad de acceder a recursos financieros y mercados más grandes; ya que en la actualidad producen básicamente para un mercado local y carecen de recursos financieros necesarios para reactivar su producción (Aquino Centeno, 2015).

Al mismo tiempo estrategias como los Circuitos Cortos de Comercialización (CCC) que pretenden impulsar el movimiento de productos locales y regionales, impulsando la agricultura familiar y la inclusión de los productores a mercados de pequeña escala. En los circuitos de comercialización se plantea como una alternativa a las cadenas largas y los grandes circuitos de distribución. En los entornos rurales donde son empleados son territorios donde no todos los productores se puedan beneficiar.

Una de las características que fortalece a los mercados domésticos o CCC son los productos que estar ligados al territorio y, si son elaborados, con ingredientes locales fundamentalmente del mismo territorio, en su origen tienen que cumplir también unos criterios sociales. Los mercados domésticos y la existencia masiva de ferias y mercados tradicionales o de plaza, donde existe un fuerte vínculo entre la canasta de bienes y servicios locales y los activos bioculturales propios del territorio (UNIA, 2011).

3. METODOLOGÍA

Para el desarrollo de la presente investigación fue necesario seguir un orden metodológico. Se parte de la revisión de literatura, en donde se consultaron fuentes secundarias. A través de esto se dio paso a lo que fue la construcción del marco referencial y por otra parte a la aplicación del análisis de contenido. El análisis de contenido permitió la identificación de las características que establecen la DOM y la NOM para la producción y comercialización de mezcal, y facilitar la relación de la NOM con las condiciones en las que se produce y comercializa el “mezcal” en las comunidades seleccionadas.

La observación de campo no experimental consistió en la contextualización y visita a las comunidades de Jalmolonga, Malinalco y Santa María la Asunción, Zumpahuacán, ambas identificadas por personas locales y externos como productores de mezcal. Los municipios siendo geográficamente vecinos cuentan con características distintivas marcadas, tanto de educación, nivel socioeconómico y nivel de desarrollo rural, pero también comparten algunos conocimientos y tradiciones. En este caso se empleó como instrumento una guía de observación o de campo (Rojas, 2006) (Ver tabla 1).

Tabla 1: Elementos a identificar en la observación de campo no participativa.

Preguntas	Explicación
¿Conocen la DOM?	Identificar el conocimiento que los productores tienen con respecto a la existencia de la DOM.
¿Qué especie de agave - maguey utilizan?	Conocer los agaves silvestres de los municipios y la forma que lo emplean.
¿Forma de cultivo del agave – maguey?	Observar los tipos de plantación y viveros que utilizan para obtener el agave – maguey.
¿Qué categoría de destilado realizan?	Identificar la categoría que mezcal que realizan
¿Qué proceso productivo de mezcal utilizan?	Describir los procesos productivos de mezcal artesanal existentes en Malinalco y Zumpahuacán, Estado de México.
¿Cuál es su forma de comercialización?	Describir la forma de interacción con los consumidores.
Objeto	Destilerías, Palenque de mezcal
¿Sobre qué aspecto?	Sobre proceso productivo agave – mezcal (destilado de agave).
¿Quién?	Wendy Elizabeth Garcés Estrada
¿Cuándo?	27 de octubre, 15 de noviembre
¿Lugar de recolección de la información?	Jalmolonga (la Hacienda) municipio de Malinalco y Santa María la Asunción, municipio de Zumpahuacán.
¿Cuántas veces?	2 veces, una por localidad
¿Qué técnica de recolección?	Observación no experimental
¿Con qué?	Guía de observación
¿En qué situación?	Investigador

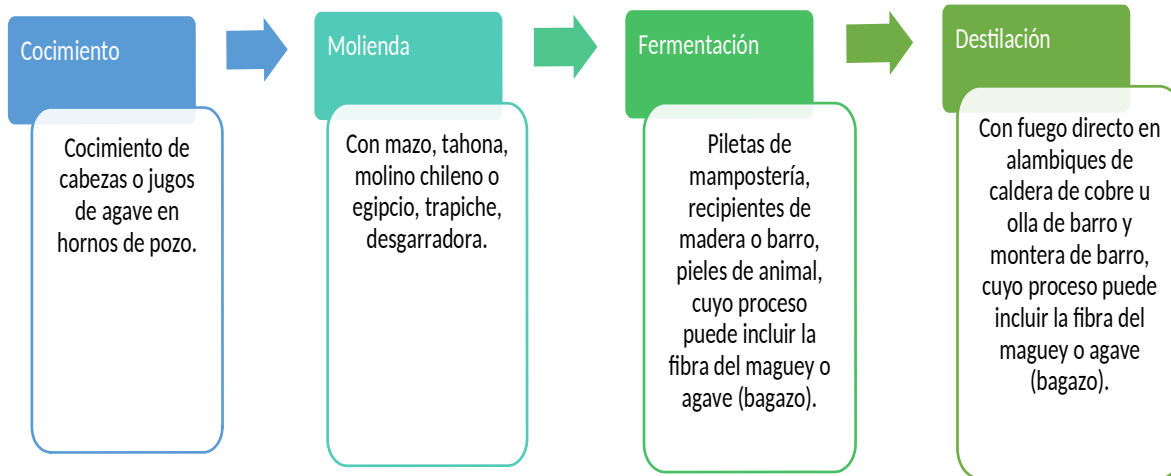
Fuente: Elaboración propia con base en Rojas 2006.

Los recorridos se realizaron en los municipios de Malinalco y Zumpahuacán, la selección de las zonas se realizó mediante la identificación y recomendación de personas locales de las zonas donde se produce destilado de agave, lugares donde se comercializa. Resultando elegidas las comunidades de Jalmolonga la hacienda en Malinalco y Santa María la Asunción de Zumpahuacán, las fechas fueron elegidas en temporada de secas, que es cuando los productores retoman su actividad después de los días lluviosos de verano y se preparan para vender en diciembre, fecha que ellos consideran como temporada alta.

4. RESULTADOS

La norma NON 070-SCFI-1994, es la que establece las características y especificaciones que se deben cumplir para producir y/o comercializar la bebida alcohólica destilada denominada mezcal. En ella se sustenta la autorización al etiquetado de la DOM. En 2017 fue publicada las modificaciones a la NOM, las especificaciones para la producción y comercialización descritas en el **diagrama 1** pertenecen a la NOM 070- SCFI- 2016. El diagrama describe el proceso artesanal debido a que en la mayoría de las comunidades del Estado de México se produce artesanalmente.

Diagrama 1: Procesos de producción artesanal de Mezcal por la NOM 070 SCFI 2016



Fuente: Elaboración propia con datos de la NOM-070-SCFI-2016

En esta NOM, se establecen tres diferentes categorías para el proceso de producción de mezcal (industrial, artesanal y ancestral). En la mayoría de las comunidades se utiliza el método artesanal, seguido del ancestral y el mezcal, industrial, denominado así para no afectar su venta con respecto a las otras categorías.

Para envasar la bebida alcohólica destilada denominada Mezcal se debe contar con autorización del Organismo Evaluador de la Conformidad (OEC). Cuando el envasador lleve a cabo el envasado de otros productos distintos al Mezcal, debe contar en sus instalaciones con líneas diferenciadas de envasado, previamente autorizadas por el OEC, asegurando que el mezcal no entre en contacto con líneas, contenedores o infraestructura que pudieran servir para el proceso, transporte o contención de otra bebida o producto alcohólico.

En el **diagrama 2**, se muestra las etapas que debe tener el producto terminado para ser envasado de manera manual o mecánica en recipientes conforme a la NOM-142-SSA1/SCFI-2014.

Diagrama 2: Etapas de envasado.



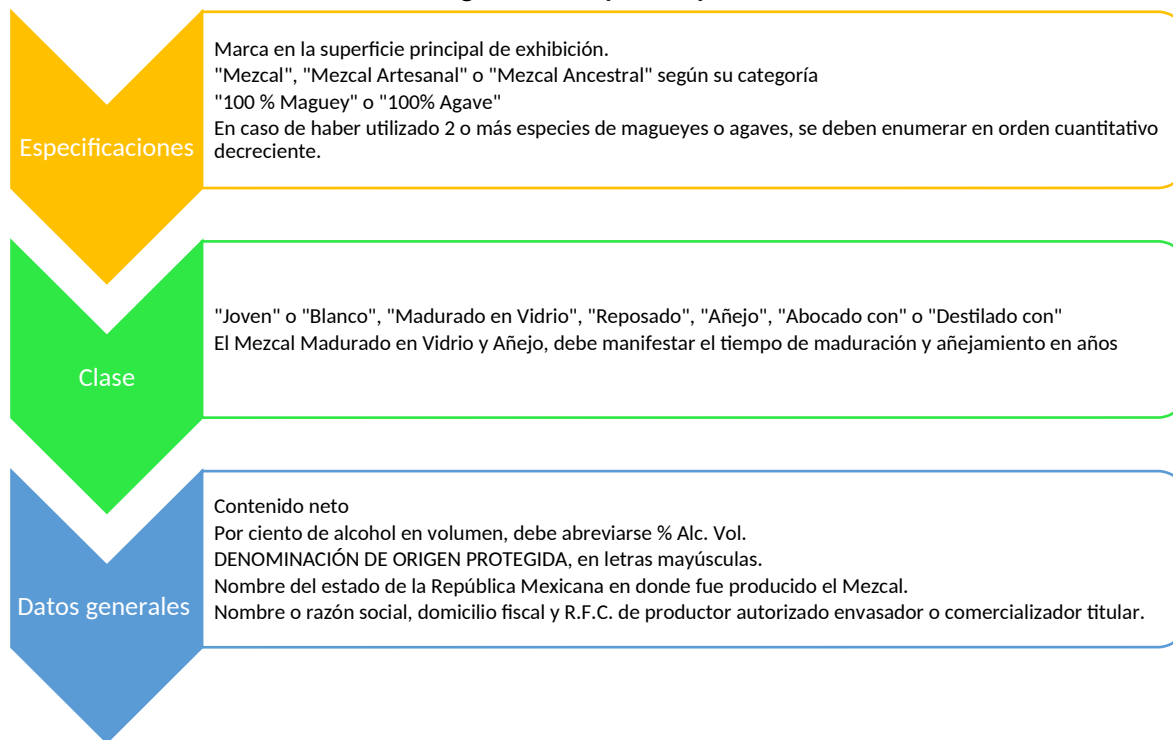
Fuente: Elaboración propia con datos de la NOM-070-SCFI-2016

El envase debe ostentar una etiqueta, cuya información debe ser legible a simple vista. Se pueden utilizar letras mayúsculas o minúsculas de forma indistinta, salvo en los casos en que esta Norma Oficial Mexicana u otros instrumentos jurídicos dispongan lo contrario. El **diagrama 3** muestra el contenido que debe presentarse en el etiquetado para venta nacional.

Cada envase debe llevar grabada o marcada la identificación del lote a que pertenece que permita su rastreabilidad, debiéndose expresar en la etiqueta o en la botella. Se permite su presentación por escritura a mano de manera claramente legible, visible e indeleble para el consumidor. Así mismo, para su identificación la NOM-142-SSA1/SCFI-2014. La leyenda Hecho en México o Producto de México o el gráfico de indicación de procedencia es información opcional.

La información que se exprese en las etiquetas debe ser veraz, comprobable y exenta de textos, frases, imágenes, marcas y otras descripciones que induzcan o puedan inducir a error o confusión por engañosas o abusivas. Debe estar exenta de denominaciones, leyendas, nombres comerciales, clases y categorías asociadas o correspondientes a otras bebidas alcohólicas (NOM, 2017).

Diagrama 3: Etiquetado para venta nacional.



Fuente: Elaboración propia con datos de la NOM-070-SCFI-2016

4.1. PROCESO DE PRODUCCIÓN DEL DESTILADO DE AGAVE EN MALINALCO Y ZUMPAHUACÁN

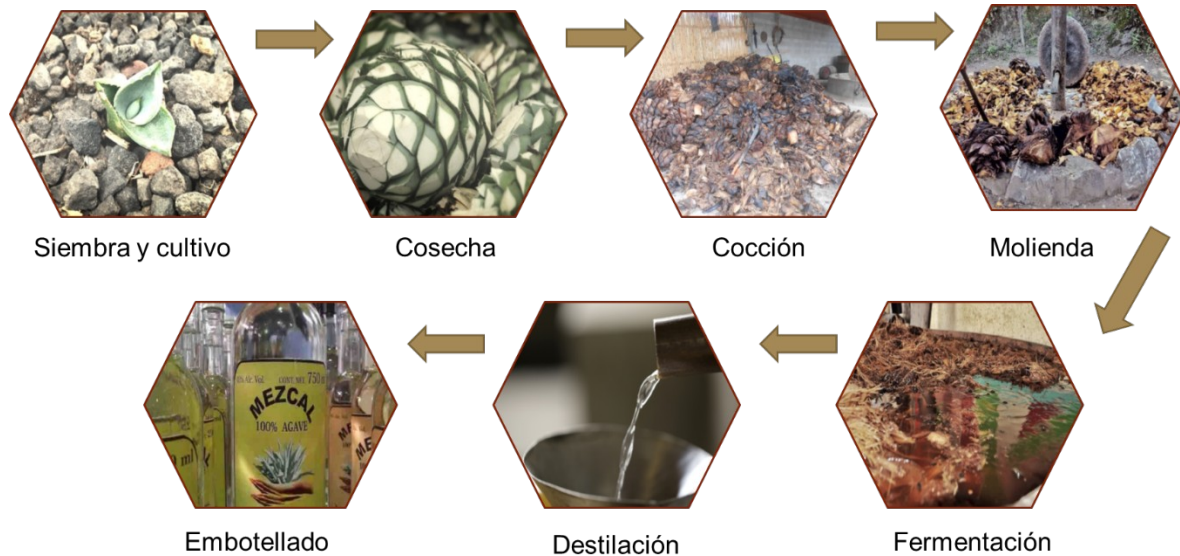
La observación de campo no experimental se realizó en las comunidades de los municipios de Zumpahuacán y Malinalco, estos municipios son un caso representativo de aquellas comunidades que actualmente producen mezcal en el Estado de México sin contar con la Dominación de Origen Mezcal.

Zumpahuacán, colinda al norte y noroeste, con Tenancingo; al este, con Malinalco; al sudeste, con el estado de Morelos; al sur y suroeste, con el estado de Guerrero; al oeste, con Tonatico e Ixtapan de la Sal y al noroeste, con Villa Guerrero (Casanova, 1999). Por su parte Malinalco colinda al norte y al este con los municipios de Joquicingo y Ocuilan; al sur y al oeste con el municipio de Zumpahuacán y el estado de Morelos. Tiene 41 localidades, de las cuales las más reconocidas como mezcateras son: San Pedro Chichiasco (San Pedro), Jalmolonga (La Hacienda), Palmar de Guadalupe, y el Ejido de Chalmita.

La producción de destilado de agave en el municipio de Malinalco se concentra en las comunidades del el Palmar de Guadalupe y San Pedro Chichiasco, la Alameda, el Zapote y Palpan; mientras en Zumpahuacán se ubican las comunidades de San Gaspar y Santa María la Asunción. Ambos municipios cuentan con asociaciones de productores de destilados de agave.

El proceso de producción del mezcal en las localidades de Zumpahuacán y Malinalco se encuentra en la categoría artesanal. En el **diagrama 4**, se muestran el proceso que ambas comunidades realizan.

Diagrama 4: Proceso de producción artesanal de los municipios Zumpahuacán y Malinalco, Estado de México.



Fuente: Elaboración propia con datos de observatorio de campo.

4.2. PRODUCCIÓN DE DESTILADOS DE AGAVE EN ZUMPAHUACÁN

Se realizó un recorrido por la localidad de Santa María Asunción, Zumpahuacán con la finalidad observar el proceso del sistema productivo agave – mezcal y compararlo con el estipulado en la NOM. En el recorrido se identificó a la Asociación de Productores de destilados de agave de Zumpahuacán S.C. de R.L. de C.V, la cual fue fundada en 2007 con 7 socios, maestros mezcaleros, mismos que son productores y comercializadores de destilado de agave “La Perla”. El agave utilizado por los productores de Zumpahuacán es *Angustifolia Haw*, la comunidad lo conoce por el nombre de maguey criollo.

La destilería, así es como llaman al lugar donde trabajan en “La Perla”, tiene como maestro mezcalero al señor Jeremías Vázquez Días, el cual tiene distintas parcelas de *agave Angustifolia*. El mantenimiento de las parcelas consiste en: podas, recolección de hijuelos y control de plagas. Por otra parte, cuenta con parcelas específicas para el cultivo de agave por semilla, este método de reproducción es delicado y requiere de cuidados.

El proceso de elaboración del mezcal inicia con la colecta de agaves maduros, estos se identifican por el brote del quiote o florescencia, se corta el quiote, para que la piña conserve todos sus azúcares, pues de no hacerlo así el quiote los absorberá, dejando al agave inservible para la producción del mezcal. Se procede a limpiar el agave con un machete de vuelta de la parte inferior, donde posteriormente se corta con hacha para desprenderlo del suelo y comenzar con el rapado del mismo, también conocido como jima. Esto consiste en quitar con machete todas las pencas del maguey y dejar al descubierto la piña.

Se trasladan las piñas de agave a la destilería, dependiendo de la cantidad se utiliza una camioneta o se contrata un volteo para llevarlas al horno, en donde se parten a la mitad para acomodarse dentro del horno de tierra. El horno previamente calentado con leña maciza de árboles se utiliza para cocer las piñas. Es importante mencionar que no se talan árboles; solo se podan para contribuir al crecimiento de estos, respetando así del equilibrio ecológico y del medio ambiente.

Para la preparación del horno se necesita: matorrales secos palma seca, leña gruesa y delgada. Se coloca una primera capa de matorrales, la siguiente de palma seca, otra de leña delgada, seguida de troncos de leña gruesa, la última capa es de piedras. La leña se quema durante 4 o 5 horas para que el horno tenga una temperatura ideal, y las piedras conserven el calor. Cuando el horno ha dejado de sacar humo y la leña se ha terminado de quemar, se acomodan las piñas dentro del horno y se van tapando con una capa de palma seca y una capa de tierra hasta quedar completamente cubiertas. Se deben asegurar que no existan fugas o grietas por donde pueda entrar oxígeno.

El horno durará tapado de 3 a 5 días, las piñas siguen cociéndose, posteriormente se procede a destapar el horno, dejándose enfriar las piñas cocidas para pasarlas a la molienda, esta se realiza por medio de una desgarradora, anteriormente se utilizaba mazo y machete. La desgarradora troza en pequeñas partes la piña este proceso permite conservar los jugos de las piñas aprovechando las mieles y azúcares. Después de

destazarlos, el bagazo se deposita en tambos de plástico. Al momento de llenarlos de bagazo se pasa al área de fermentación. Cada tambo es registrado con la fecha de inicio de fermentación.

La fermentación se realiza con sus mismas azúcares y levaduras del bagazo, es un proceso natural y no se agrega ninguna sustancia química. La etapa de fermentación durará, dependiendo de las condiciones climatológicas, desde cuatro a ocho días para adquirir su temperatura, donde el bagazo debe oler a mezcal y tiene un sabor amargo. Un rasgo para identificar el tiempo de finalización de la fermentación es la producción de espuma que aminora, el agua deja de moverse y se llegan a percibir pequeñas burbujas por largos espacios de tiempo.

Para la destilación se utiliza un alambique estilo filipino, este consta de un tambo de lámina hundido en la tierra, solo con un espacio para el horno, y encima el cascomite. El cascomite es un tronco hueco de zompante mejor conocido en la región como colorín; que es usado para la destilación, es elaborado por cada maestro mezcalero dependiendo de sus necesidades y funcionalidad. El cascomite es por donde sube el vapor, en la parte superior lleva un caso de cobre que hace la función de condensador y es sellado por barro de la región. El proceso de destilación dura de 2 a 3 horas, de cada tambo que se destila se llena una garrafa de 20 litros. Para que caiga la primera gota de mezcal es de 20 a 40 minutos dependiendo del fuego que tenga. El primer litro de mezcal que sale de la destilación se le llama “*puntas*” y llega a tener de 70 a 80 grados de riqueza alcohólica.

El destilado de agave en clase joven se conserva en garrafas para su posterior envasado y etiquetado, los destilados de clase añejados se conservan en una barrica nueva por más de 3 meses, con el propósito de que la madera se le fusione con los sabores del destilado. Las barricas tienen una vida útil de 8 veces. En cuanto al envasado y etiquetado del destilado de agave, se tiene una marca colectiva registrada como “La perla”, la cual se especifica la categoría y el tipo de destilado, ellos manejan: joven, reposado y añejo.

El producto es envasado y etiquetado en botellas de vidrio o pet de diferentes tamaños para su venta. De igual manera el producto sigue conservado su venta a granel. La etiqueta contiene la marca, así como categoría, la leyenda “100% Agave” y si utilizo más de dos agaves indica el tipo y cantidad de agave. No cuenta con la identificación de lotes, así como el origen del producto.

4.3. PRODUCCIÓN DE DESTILADOS DE AGAVE EN MALINALCO

Se realizó un recorrido por la localidad Jamolanga, Malinalco con la finalidad observar el proceso del sistema productivo agave – mezcal y compararlo con el estipulado en la NOM. La parcela ubicada en Jalmolonga, a cargo del Sr. Elias Medina cuenta con *Agave angustifolia*, mejor conocido en la población como “criollo”. Dicha parcela tiene la función de reproducción de los agaves (vivero), el cual solo los dejan crecer en promedio entre tres o cuatro años, para realizar el trasplante a la parcela definitiva en donde terminan su maduración.

En la cosecha se seleccionan los agaves que se encuentran maduros, posteriormente se cortan y se deshojan (jima) los agaves, es el primer paso para la elaboración de destilado. Este proceso consiste en quitar las pencas, de tal forma que, como resultado solo quede la cabeza o despalcado de agave. Para esta labor se necesitan aproximadamente cinco personas, esta actividad se lleva a cabo en tres días. Posteriormente las cabezas son llevadas al palenque para iniciar el proceso productivo de mezcal.

El palenque es el sitio en donde se lleva a cabo el proceso de cocción, molienda, fermentación y destilación del mezcal. Su infraestructura es bastante rudimentaria, ya que solo tiene una base elaborada con tabique y concreto; las columnas que sostiene el techo de lámina de asbesto son polines de madera.

La cocción consiste en la tapada y cocción del agave, las cabezas del agave ya jimado se deben de cortar en trozos y se colocan en el horno previamente calentado. En el horno se coloca leña de delgada a gruesa, cuando la leña se ha convertido en carbón, se le colocan piedras, una vez se haya alcanzado una temperatura adecuada, se procede a colocar las cabezas de agave partidas dentro del mismo, y se cubre rápidamente con palma y tierra, evitando en todo momento que quede algún orificio por el cual pueda entrar oxígeno.

La cocción tarda entre 3 o 4 días dependiendo la cantidad de agave colocado en el horno. Una vez, transcurrido el tiempo de cocimiento se procede a realizar el destapado de las piñas, esto consiste en sacar las cabezas de agave cocido del horno. Las cabezas cocidas son transportadas en unos tambos de plástico donde se lleva a cabo el proceso de enfriado que tarda por lo menos un día para después llevarlas a la molienda.

El proceso de molienda artesanal utiliza un mazo de madera y una plancha de concreto, en donde son colocadas y golpeadas las piñas cocidas, hasta que se forman trozos pequeños, cabe resaltar que se desperdician jugos que caen en la tierra, ya que no cuentan con una estructura que sea completamente de concreto que lleve a alguna parte para la recolección de mostos. Una vez terminada la molienda inicia el proceso de fermentación, esta etapa es la previa a la destilación. Los trozos de agave majados son colocados en tambos de plástico con suficiente agua, se deja así aproximadamente una semana. El maestro mezcalero revisa constantemente en que fase de la fermentación se encuentra. Al finalizar la fermentación se debe

comenzar inmediatamente a destilar, debido a que los jugos se agrian y las levaduras de la fermentación se mueren. Cabe destacar que dentro del proceso de fermentación no se agrega ningún compuesto adicional, por lo que solo se lleva a cabo mediante la fermentación de sus propios azúcares.

En el proceso de destilación se utilizan estructuras tradicionales, en el caso de Malinalco en este proceso se utiliza un alambique de cobre dentro de un tronco hueco, utilizan barro para sellar los extremos del alambique para evitar fugas de calor. El alambique se encuentra situado encima del horno, el cual lo provee de calor durante todo el proceso de destilación. En la destilación se realiza la concentración del mezcal y la evaporación del agua, el mezcal se condensa y es captado por una cuchara conectada a un sistema de maneras. Este sistema permite enfriarlo a través de un tubo que atraviesa por un bote de agua fría hasta ser recolectado gota a gota en una garrafa.

Permanece en las garrafas hasta la realización de una segunda destilación para controlar el volumen de alcohol, que se le conoce como rectificación o refine, la cual es la combinación de las puntas (aproximadamente los primeros 20 litros) los cuales contienen un porcentaje de alcohol mayor a 68%, lo último de la destilación contienen un volumen de alcohol inferior a la 15%. Con esto se consigue homogenizar el porcentaje de alcohol que quedará entre 45 y 55%.

En promedio un tambo de 200 litros fermentados, se convierten en 90 litros de destilado de agave. El proceso tiene una duración de 20 días aproximadamente. El destilado es almacenado en tambos, que se guardan en la casa del maestro mezcalero. Son comercializados a granel en la localidad. Algunos los llevan a localidades vecinas y lo transportan en garrafas de 20L. El producto se vende a granel por lo que es envasado en botellas de vidrio y pet de re-uso. No cuenta con etiqueta.

4.4. COMPARACIÓN DE LOS PROCESOS DE PRODUCCIÓN DE MALINALCO Y ZUMPAHUACÁN

En la **tabla 2** se muestra un comparativo de lo establecido por la NOM para la producción, envasado y etiquetado de mezcal y lo observado en las comunidades de Malinalco y Zumpahuacán. Se identifican las especificaciones que cumplen los destilados de agave de Malinalco y Zumpahuacán.

Tabla 2: Comparación NOM – Malinalco - Zumpahuacán.

Especificaciones de la NOM-070-SCFI-2016 (Proceso de producción)	Malinalco	Zumpahuacán
Colectas de material silvestre y de cultivo	✓	✓
Cocción	✓	✓
Molienda	✓	✓
Fermentado	✓	✓
Destilación	✓	✓
Almacenamiento	X	X

Especificaciones de la NOM-070-SCFI-2016 (Envasado)	Malinalco	Zumpahuacán
Filtración del producto	X	x
Llenado	X	x
Tapado	✓	✓
Sellado	X	x
Tipo de Envase		
• Pet	✓	✓
• Vidrio	X	✓
• Granel	✓	✓

Especificaciones de la NOM-070-SCFI-2016 (Etiquetado)	Malinalco	Zumpahuacán
Especificaciones	x	✓
Clase	x	✓
Datos generales	x	✓
Identificación de Lote	x	x
Identificación la NOM-142-SSA1/SCFI-2014	x	x
Tipo de mezcal producido	Tipo I	Tipo I y Tipo II
Comercialización	Local	Local

Fuente: Creación propia.

El destilado de agave de Malinalco y Zumpahuacán obedecen a lo establecido por la NOM en cuanto a la producción se refiere, solamente se incumple con lo establecido para el almacenamiento, ya que al ser producciones de traspato no cuentan con lugares adecuados para su almacenamiento. En cuanto al envasado, Malinalco no cumple con lo establecido por la NOM, esto dificulta su comercialización, venta y consumo ya que no garantiza las condiciones salubres adecuadas; además el producto al ser vendido a granel y no contar con un envasado adecuado no permite una adecuada identificación del producto por parte del consumidor y su distribución en mercados locales o regionales formales se verá entorpecido.

Por su parte Zumpahuacán cumple con lo establecido con la NOM en cuanto al envasado solamente incumple con el sellado que afecta en la colocación de mercados formales a nivel regional o nacional. En cuanto al etiquetado cuenta con las características de identificación del producto establecidas por la NOM, con lo que el consumidor puede identificar a través de la marca el destilado de Agave así como sus características.

5. CONCLUSIONES

La estrategia de revalorización de los productos artesanales no fomenta el consumo de los distintos destilados que se encuentran fuera de la DOM, manteniendo aspectos culturales (tradiciones y costumbres ancestrales). Los destilados artesanales se caracterizan volúmenes de producción limitado y por poseer características únicas, que lo hace susceptibles a ser devorado por la industrialización lo que como consecuencia se pone en riesgo a las especies silvestres de agave- Existen beneficios sociales y culturales menos tangibles que deberían considerarse para valorizar esta actividad, pues de ella depende la trascendencia y conservación de saberes de los maestros mezcaleros y las tradiciones, así como la conservación de especies de agave.

Con la finalidad de disminuir el impacto que ha tenido la DOM en los productores del Estado de México, el gobierno ha creado diferentes programas; el objetivo de dichos programas es aumentar el volumen de producción con la idea alcanzar mercados de exportación. Sin embargo, los apoyos no han sido congruentes con las situaciones de las comunidades, debido a que se pretende implantar otras variedades de agave. Por otro lado, han buscado a algunos productores para cambiar su alambique, por uno de acero inoxidable, los mezcalilleros no quieren, ya que consideran que se pierden los sabores del destilado.

Como resultado del trabajo de campo se observaron dos contextos diferentes, a pesar de que las comunidades son vecinas y cuentan tradiciones y costumbres similares. Por una parte, en el municipio de Malinalco se tiene una asociación para cultivar el agave, sin embargo, los productores de destilado están divididos por familias y en algunos casos se presentan problemas sociales. En la comunidad Jalmolonga solo quedan tres maestros mezcaleros, de los cuales sus nietos son los que están retomando la tradición mezcalera. La escasez de agave y su periodo prolongado de maduración hacen que se usen del agave joven pese a no tener la misma calidad, los hacen crecer por medio de la saturación de agua lo cual causa que los niveles de azúcares naturales de la planta no se concentren. Afectado la calidad organoléptica del producto y por tanto el consumo del producto.

Se carece de los controles adecuados de salubridad, debido a que los palenques son de tierra y al momento de la molienda con el mazo y la fermentación están expuestos a todos los contaminantes del ambiente. El envasado del producto se realiza en botellas recicladas sin etiqueta ya sea de otras bebidas alcohólicas, refrescos o cualquier otro recipiente hacen del destilado un producto de baja calidad, poco salubre y confiable a

los ojos del consumidor. La comercialización se destina al mercado local, quien tradicionalmente esta acostumbrado a estas prácticas de envasado y a la venta a granel en contenedores de plástico. Los volúmenes que se producen son pequeños por lo que no cubren la demanda. Al no contar con envases y etiquetas adecuadas se fomenta la reventa.

En la zona centro de Malinalco hay mezcalerías (Bares) exclusivos para turistas donde se ofrece los distintos mezcales producidos de sus comunidades y de otros Estados, así como en coctelería. Por su parte el destilado de agave de Zumpahuacán ha buscado estrategias para solventar las problemáticas a las que se enfrentan los productores que no cuentan con la DOM. A través de las marcas colectivas y la asociación logran solventar la problemática de abastecimiento de la demanda, así como los problemas de comercialización asociados al envasado y etiquetado accediendo a mercados un poco más grandes.

REFERENCIAS

- BLACKWELL, R D., MINIARD, P. W. y ENGEL, J. F. (2005) Comportamiento do consumidor. São Paulo: Pioneira, Thomson.
- CONABIO (2012) Historia de familias magueyes, recuperado en http://www.paismaravillas.mx/movil/assets/pdf/libros/magueyes_web.pdf
- Consejo Regulador de Mezcal (2017), Informe estadístico 2017, recuperado en: http://www.crm.org.mx/PDF/INF_ACTIVIDADES/INFORME2017.pdf.
- DOF (2017), NOM 070 SCFI 2016, Bebidas alcohólicas-Mezcal-Especificaciones. Recuperado en: http://dof.gob.mx/nota_detalle.php?codigo=5472787&fecha=23/02/2017
- DOF (2018), Norma oficial mexicana NOM-070-SCFI-1994, Bebidas alcohólicas-Mezcal-Especificaciones, recuperado en: <http://www.colpos.mx/bancodenormas/noficiales/NOM-070-SCFI-1994.PDF>.
- DOF (2018), RESOLUCIÓN por la que se modifica la Declaración General de Protección de la Denominación de Origen Mezcal, para incluir los municipios del Estado de México que en la misma se indican. recuperado en: https://www.dof.gob.mx/nota_detalle.php?codigo=5534193&fecha=08/08/2018
- GARCÍA, A. J. (2010). Geografía del Mezcal. Revista-Libro Bimestral No. 98. Artes de México, Mezcal “Arte tradicional”.
- GARCÍA, M. G. (2016) Importancia sociocultural del proceso productivo del mezcal en el ejido de San Pedro Chichiasco, Malinalco, México. recuperado en: https://www.chapingo.mx/revistas/textual/contenido.php?id_articulo=2220&id_revistas=2
- IMPI (2018), México ya tiene 16 Denominaciones de Origen, recuperado en: <https://www.gob.mx/imp/ articulos/mexico-ya-tiene-16-denominaciones-de-origen?idiom=es>
- MONTES R., GONZALEZ A. y JUÁREZ M. (2014) “Análisis de las condiciones geográficas y de producción del destilado de agave de Zumpahuacán, Estado de México para la obtención de la denominación de origen de mezcal.” recuperado en: <http://ri.uaemex.mx/bitstream/handle/20.500.11799/40681/Tesis%20REI.pdf?sequence=1>
- OSNAYA, S; ZARUR, J. E; ÁVILA, J. J. A. (2015) Investigación Aplicada en la Sociedad de Productores y Destiladores de Agave Sp de Zumpahuacán para la Optimización de su proceso productivo y la Reutilización Sustentable de sus desechos recuperado en: <http://hdl.handle.net/20.500.11799/32429>
- ROJAS, S.R., (2006). Guía para realizar investigaciones sociales, 205-221.
- RANABOLDO, C. AROSIO, M. y DÍAZ, P. (2016), Circuitos cortos de comercialización; El caso de los Mercados Públicos Institucionales, recuperado en: http://www.bioculturaldiversityandterritory.org/documenti/263_300000176_circuitoscortosdecomercializacio769n.resumeneje cutivo2016.pdf
- Seale & Associates (2018), Bebidas alcohólicas en México, reporte de industria 2018, recuperado en: <http://mnamexico.com/wp-content/uploads/2018/08/Bebidas-alcoh%C3%B3licas-M%C3%A9xico-Final.pdf>
- SALAS T. J. y HERNÁNDEZ, L. Y. (2015), Mezcal cupreata, fuente de admiración, recuperado en: https://www.revistaciencia.amc.edu.mx/images/revista/66_3/PDF/Mezcal.pdf
- SUÁREZ, J. A. (2016), Automatización de la molienda en la fabricación artesanal de mezcal, recuperado en: <http://www.ptolomeo.unam.mx:8080/xmlui/bitstream/handle/132.248.52.100/10909/Automatizaci%C3%B3n%20de%20la%20molienda%20en%20la%20fabricaci%C3%B3n%20artesanal%20del%20mezcal.pdf?sequence=1>
- UNIA (2011), Mercados locales y canales cortos de comercialización. Implicaciones para un consumo responsable (UD3) Bloque II: Sistemas alternativos de circulación y consumo de alimentos. La construcción de la soberanía alimentaria, en: https://dspace.unia.es/bitstream/handle/10334/3706/UD3_Mercados_locales.pdf?sequence=1

THE INFLUENCE OF SOCIABILITY OVER NON-MORTGAGE DEBT

DJAMILA DAOUDI

PhD Student (0000-0003-2815-1866)/Department of Financial Economics and Accounting/
Universidade de Santiago de Compostela/Faculty of Economics and Business
PC 15782 - Santiago de Compostela (Spain)/djamiladaoudi@rai.usc.es

SARA FERNÁNDEZ-LÓPEZ

Associate Professor (0000-0003-2496-4333)/ Department of Financial Economics and Accounting/Universidade de
Santiago de Compostela/Faculty of Economics and Business
PC 15782 - Santiago de Compostela (Spain)/sara.fernandez.lopez@usc.es

LUCÍA REY-ARES

Assistant Professor (0000-0002-5165-742X)/ Business Department/Universidade da Coruña
Faculty of Humanities and Documentation/
Campus de Esteiro, s/n. PC 15403 - Ferrol (A Coruña)/lucia.rey.ares@udc.es

SANDRA CASTRO-GONZÁLEZ

Assistant Professor (0000-0002-8206-1776)/ Department of Business Organization and Commercialisation
Universidade de Santiago de Compostela/Faculty of Business Administration
Campus de Lugo. Avda. Alfonso X El Sabio, s/n. PC 27002 - Lugo/sandra.castro@usc.es

e-mail Djamil Daoudi: djamiladaoudi@rai.usc.es

Abstract

In recent years, especially after the recent economic downturn, household debt has increased in importance, due to its influence on the economy, in general, and on households' well-being, in particular. Therefore, the study of household debt turns out to be necessary, in order to know what leads to its demand, and thus avoiding situations of over-indebtedness. In this regard, previous research has analysed debt decisions from different approaches; however, the effect of individuals' sociability has been neglected in the literature.

To this end, the aim of this paper is to analyse the effect of sociability on the Europeans' decision to incur non-mortgage debt. The study sample, taken from the sixth wave (year 2015) of the *Survey of Health, Ageing and Retirement in Europe*, consists of 68,231 people from 18 European countries and Israel. After applying probit binomial models, empirical evidence confirms the non-negligible effect of sociability on households' non-mortgage debts. However, this effect depends on the underlying mechanisms through which sociability operates. Thus, when the sociability variable reflects learning based on the transmission of information (or 'word of mouth'), its influence over non-mortgage debt is positive, whereas when sociability reflects learning based on observation, the effect is negative.

Key words: consumer debt, sociability, behavioural finance, Europe, SHARE.

JEL: G40, G41

1. INTRODUCTION

Literature on household finances has been more focused on household portfolio choices, while the emphasis on household debt is, as Altundere (2014) acknowledges, still novel in the literature. But household debt has an outstanding importance not only for family finances, but also for the global economy. In this regard, recent literature suggests that increases in household debt are connected with lower output growth or higher unemployment (Mian et al., 2017). The aftermath of the recent economic downturn made these relationships more evident, as households' over-indebtedness led to many defaults and foreclosures.

Household debt, as a percentage of net disposable income in 2017, displays very different figures in Europe; figures that range from the 57% of Slovenia to the 281% of Denmark (OECD, 2019). Therefore, the study of household debt, and particularly, the study of its driving forces, turns out to be necessary. Its understanding will help in knowing what leads individuals to borrow and avoiding situations of over-indebtedness. Previous research has analysed borrowing decisions from different approaches; however, the effect of individuals' sociability has been barely considered in the literature. Moreover, the existence of a 'comparison effect' has hardly been analysed in the area of household debt (Georgarakos et al., 2014). To the best of our knowledge, only Georgarakos et al. (2014) address this issue in a sample of Dutch households. However, in their papers the authors do not analyse the role of the comparison effect over the informal debts.

This paper aims to fill these gaps. Thus, the aim of the paper is to analyse the influence of sociability and relative income on the households' decision to incur non- mortgage debt, namely consumer debt and informal debt. More specifically, using a sample of 68,231 individuals from 17 European countries and Israel, we explore two potential channels through which sociability may impact on debt: the word-of-mouth communication and the observational learning.

This paper contributes to the literature in several ways. Firstly, it expands the recent literature investigating the effect of sociability and relative income on household debt, which is still rather limited (Georgarakos et al., 2014). Secondly, unlike the few empirical papers on the topic, we also analyse the effect of both afore-mentioned factors on informal debt. In so doing, we found that the influence of sociability and relative income depends on the nature of debt. Thirdly, we construct a richer set of key independent variables to capture sociability and relative income factors. Forthly, we use a larger and more diverse sample of study, which not only leads to more robust results (Farrell et al., 2016), but also it provides empirical evidence for a wide range of European countries. Finally, we find empirical evidence of the effect of relative income on household debt. With these results in mind, several recommendations to improve households' indebtedness behaviour are proposed..

The remainder of the paper is structured as follows. After this introductory section, Section 2 sets the theoretical framework. Section 3 describes the methodology and the econometric approach. Section 4 summarises the empirical outcome, and finally, Section 5 presents the concluding remarks.

2. THEORETICAL FRAMEWORK

Even though the effect of social interactions on financial decisions has long been considered, especially regarding stock market participation (Brown et al., 2008; Fernández- López et al., 2018; Hong et al., 2004; Liang y Guo, 2015), the emphasis on households' borrowing behaviour is relatively recent in the literature. This research has mainly focused on studying the mechanisms related to the peer effects (Altundere, 2014; Georgarakos et al., 2014), distinguishing two fundamental channels through which social interactions may influence borrowing, namely: the word-of-mouth communication and the observational learning.

2.1. THE WORD-OF-MOUTH COMMUNICATION

Altundere (2014) points out that although people are often reluctant to reveal their debts, when faced with financial strains they are likely to seek advice from those peers better- informed about financial matters (Okten and Osili, 2004). In this regard, Okten and Osili (2004) consider that sociability can favour borrowers when they have difficulties in collecting accurate financial information by reducing the costs of searching and accessing information, and even avoiding financial exclusion due to the lack of credit information (Stiglitz and Weiss, 1981). Georgarakos et al. (2014) demonstrate that financial advice through individuals' social networks positively influences their level of indebtedness, supporting a word-of-mouth communication effect on debt holding.

Okten and Osili (2004) also found that community social networks, and family networks to a lesser extent, have a non-negligible impact on access to credit both on the demand and on the supply side. Besides, in difficult times, people might not only request information about loans, but can also borrow from the wealthiest members of their social circle (Altundere, 2014; Brown et al., 2016). In fact, Brown

et al. (2016) confirm a positive relationship between sociability and informal debts (i.e., those debts requested to family, friends, or acquaintances).

Based on the above arguments, the following hypothesis is proposed:

H1: Sociability exerts a positive influence on household indebtedness.

2.2. THE OBSERVATIONAL LEARNING

As regards indebtedness, the influence of the social group on individual behaviour is less likely to arise from information-sharing or from direct observation of peers' debts (Georgarakos et al., 2014). Debts, unlike other financial assets such as stocks, are not directly observable and people prefer not to discuss about their indebtedness nor to display debt amounts with other people because of shame or status concern (Altundere, 2014; Collins et al., 2009; Georgarakos et al., 2014). Even so, peer effects can arise through the observation of the standard of living of the social circle(s) to which the individual belongs (Altundere, 2014; Brown et al., 2016; Georgarakos et al., 2014). Specifically, through social interaction other behaviours related to income, consumption, or living standards could be observed (Altundere, 2014). In this regard, Georgarakos et al. (2014) point out that the perception of the individuals' relative standing (i.e., the socioeconomic position of the individual as regard his/her peers) can influence household debt through three potential channels:

1. By attempting to imitate the consumption level or the lifestyle of the households within the social group (Altundere, 2014), individuals can go into debt in order to position themselves in the group's social ranking (Becker et al., 2006). In this case, the effects of sociability on indebtedness come mainly from the 'comparison effect'.
2. By assuming that, in the future, being surrounded by a social group whose members display high income levels will allow the individual to borrow directly from them.
3. By assuming that individuals' future income will move into the same direction as those of its social circle ('expectation or tunnel effect').

These types of effects emanating from the perceptions of relative standing (or observational learning), and namely the comparison effect, it has barely been analysed in the area of household debt, despite the fact that, as Georgarakos et al. (2014) highlight, this comparison effect has already been demonstrated on other economic behaviours, such as consumption or job offer.

Under the hypothesis of relative income (Duesenberry, 1949), the first theoretical approach in formalizing the importance of peer income for consumption, those households that perceive their incomes below average within their social circle tend to spend a greater share of their income in order to keep up with their peers. To the best of our knowledge, only two papers explicitly analyse the relationship between relative standing and debt. Christen and Morgan (2005) confirm that individuals go into debt in order to maintain a certain level of visible consumption (*conspicuous consumption*) that guarantees a social position that complies with the standards set by society. Moreover, as income inequality increases, individuals, even those ones that intrinsically risk adverse, assume more debt (i.e. more risk) to keep the living standards of their social circle. (Gaba and Kalra, 1999). This behaviour boost the households' financial fragility of households (Christen and Morgan, 2005), especially during the economic shocks. More recently, Georgarakos et al. (2014) find that households with perceived income below average in their social circle tend not only to consume a greater share of their income, but even go into debt to match the standards of their peers ('the Joneses effect'). See Lance (2013) for an extended explanation.

Based on the above arguments, the following hypothesis is proposed:

H2: The relative income exerts a negative influence on household indebtedness.

3. METHODOLOGY

3.1. SAMPLE AND DATA

The data used for the analysis comes from the sixth wave of the *Survey of Health, Ageing and Retirement in Europe* (SHARE), a cross-national panel database that provides socio-demographic information on individuals aged 50 or over from various European countries as well as Israel (Börsch-Supan, 2017). The multidisciplinary nature of this survey makes possible the study of interactions between personal and social traits and financial decisions.

Data for the sixth wave, the most complete to date as regards the social network module, was conducted in 2015. Some adjustments were made to the original sample. These adjustments entail two variables -namely, financial risk preferences and income variables- due to their missing values, that might lead to significant bias and considerable loss of information (Moreno-Herrero et al., 2017). In the first case, the missing values were completed with information from the fifth wave, as the question on

risk preferences is mainly posed to the refreshment sample of the sixth wave. On the second case, missing data on income was completed with the mean value over the five implicates -from the imputation module of the survey- of the household income variable. The final sample comprises 68,231 individuals living in 18 countries.

3.2. DEFINITION AND MEASUREMENT OF THE VARIABLES

The main dependent variable for this analysis is households' consumer debt (*consumer debt*). Similarly to Altundere (2014), Georgarakos et al. (2014) and Brown et al. (2016), it is measured as a dummy variable that takes the value 1 if the household (i.e., the respondent or his/her partner) has any of the following debt: debt on cars and other vehicles; debt on credit cards/store cards; loans (from bank, building society or other financial institution); debts to relatives or friends; and/or student loans. The dummy dependent variable takes the value 0 in case the household does not hold any of the aforementioned debts.

Besides, as demonstrated in the following section, the empirical evidence led us to consider a second dependent variable. This variable (*informal debt*) informs about households' informal debts, given that the characteristics of this kind of debt might differ from the ones of formal debt. It is measured as a dummy variable taking value 1 if the household has any debt to relatives and friends; and value 0 otherwise.

The key independent variables for this research refer to the individuals' sociability and to households' relative income. Most of them are dummy variables that were created based on the financial literature. Thus, following Agarwal et al. (2010), Altundere (2014), Brown et al. (2016), or Okten and Osili (2004), the first variable measuring sociability (*sociability*) is a dummy variable taking value 1 if the individual participated, in the last twelve months, in any of the following activities -and value 0 if he/she did not participate in any of the activities-: done voluntary or charity work; attended an educational or training course; taken part in a political or community-related organization; or gone to a sport, social or other kind of club. According to Hong et al. (2004), the use of this kind of variables as proxies of sociability and information-sharing is supported by a vast body of literature on sociology, which emphasises the role played by informal channels (Granovetter, 1983).

Two additional variables on sociability were created, based on the previous aforementioned variable and following Altundere (2014). On the one hand, the variable on 'extensive-sociability' (*ext_sociability_#*) considers the number of activities in which the individual participates (ranging from 0 to 4). It is intended to capture the importance of participating in more than one social activity, which can lead the individual to belong to more than one social circle (i.e., sample unites, as Georgarakos et al. (2014) define them, with a common set of characteristics -e.g., age and education-). On the other hand, the variable on 'intensive-sociability' (*int_sociability*) considers the frequency of that social interaction, constituting a dummy variable taking the value 1 if the individual has done almost every day, at least one of the social activities previously listed; and the value 0 if the frequency of participation is lower.

Financial advice (*fin_advice*) is also considered in the analysis, following Georgarakos et al. (2014). A proxy variable was constructed based on the question asking for the type of help the individual received in the last twelve months. This dummy variable takes the value 1 when the individual affirms to receive help with paperwork, such as filling out forms, settling financial or legal matters; and value 0 otherwise.

The variables on relative income were also constructed in order to test the second hypothesis. Namely, a variable on relative income (*relative_inc*) comparing individual income with the median income of the country of residence was included. In this regard, values close to 1 indicate that household income is similar to the median income of the country, whereas higher (lower) values indicate that household income are above (below) the country's median income. Besides, the squared relative income variable (*relative_inc²*) was considered, in order to test potential nonlinear relationships.

In order to focus on individuals whose income falls below the country's median (Georgarakos et al., 2014), an additional variable was considered. Namely, a dummy variable (*relative_inc_d*) taking value 1 when households' relative income falls below 1; and value 0 otherwise.

Finally, other variables aimed at testing the distance to the median income of the country are included. Thus, two categorical variables were considered in the analyses: the first one denotes income quartiles (*inc_quartile_#*); and the second one (*inc_grouped_#*) stems from grouping the categories of previous variable (i.e., a variable with three categories depending if the household's income belongs to the first quartile -below 25%- , to the second or third quartile -between 25% and 75%- , or to the fourth quartile -upper 75%-).

Table 1 summarises the descriptions of the control variables.

Table 1. Control variables' definitions

Factor	Variable	Definition
Economic	Employment status (<i>employment</i>)	Dummy variable equal to 1 if the individual is an employee or self-employed; 0 otherwise
	Income level (<i>l_income</i>)	Natural logarithm of annual income received by the household
Demographic	Marital status (<i>marital status</i>)	Dummy variable equal to 1 if the individual is married -living with the spouse- or in a common-law relationship; 0 otherwise
	Household size (<i>hhd_size</i>)	Number of people in the household
	Age (<i>age</i>)	Age of the individual in years
	Gender (<i>gender</i>)	Dummy variable equal to 1 if the individual is male; 0 if female
	Educational attainment (<i>education_#</i>)	Categorical variable on the highest level of education an individual has achieved according to ISCED 1997: pre-primary education (0); primary or lower secondary education (1) [reference category]; upper secondary or post-secondary non-tertiary education (2); tertiary education (3)
Behavioural	Risk preferences (<i>risk_aversion</i>)	Dummy variable equal to 1 if the individual refuses to take any financial risk; 0 if he/she is willing to take any financial risk
Countries	Country (<i>country_#</i>)	Dummy variable equal to 1 if the individual belongs to a concrete country; 0 otherwise. The countries included are Austria, Belgium, Czech Republic, Croatia, Denmark, Estonia, France, Germany, Greece, Israel, Italy, Luxembourg, Poland, Portugal, Slovenia, Spain, Sweden, and Switzerland. Austria is the reference country, so seventeen country dummy variables are included in the model.

4. MODEL SPECIFICATION

This paper is aimed at analyzing the effect of sociability and relative income upon the decision to borrow. To accomplish this objective, a set of ten probit models were used to model a non-linear relationship between the dummy dependent variable and a set of independent variables.

The probit model specification was:

$$Probability (Y_i = 1) = \Phi (\beta_0 + \beta_1 Sociability_j + \beta_2 Relative\ income_j + \beta_j Control_variables_j)$$

The dependent variable (Y_i) quantifies the individual's probability of holding debt, i is the index of the individual, and Φ denotes the standard normal distribution function. *Sociability* includes the different measures of sociability that are consecutively included in the models. Similarly, *Relative income* includes the different measures on the households' relative income; and *Control_variables* refers to the set of control variables defined in Table 1.

5. EMPIRICAL RESULTS

5.1. UNIVARIATE ANALYSIS

Summary statistics of dependent and independent variables are displayed in Table 2. As previously mentioned, the final sample is comprised of 68,231 individuals with an average age of 67 years old. The

majority are women (56.5%) that have a formal commitment (68.3%) and are not employed (75.2%). The average number of people in the household is close to two.

Less than half of the sample (39.7%) participates in any on the social activities listed in the last twelve months. Among those who participate in social activities, 25% practises one activity, 10.3% two activities and the percentage decreases as the number of activities increases. Besides, 14.5% of the sample practise almost every day at least one social activity.

Concerning the economic situation, the household average annual income is €25,020. As regards household debt, 13.7% of respondents declare to have consumer debts, and only 1.1% admit having any informal debt (i.e., any debt to family or friends).

Almost one third of the sample (31.8%) admits receiving help with paperwork, in order to deal with issues such as financial matters. Regarding educational attainment, most of respondents indicated they have completed upper secondary or post-secondary education (37.2%), followed by those who have completed primary or lower secondary education (36%) and tertiary education (21.8%). A 74.8% of the sample refuses to take any financial risk when dealing with saving and investment decisions.

Table 2. Descriptive statistics

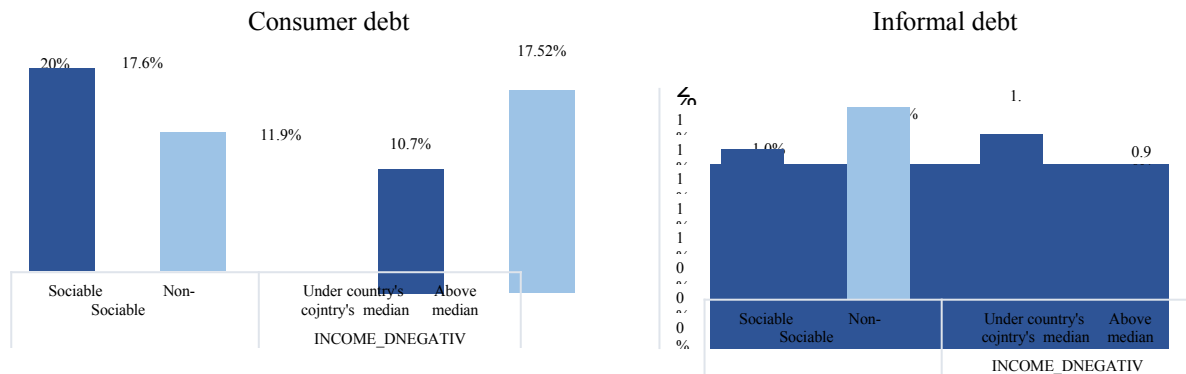
Variable	Number of observations	Mean	Std. Dev.	Min.	Max.
Consumer debt (<i>consumer_debt</i>)	45,907	0.137	0.34	0	1
Informal debt (<i>informal_debt</i>)	45,907	0.011	0.11	0	1
Sociability (<i>sociability</i>)	64,726	0.397	0.48	0	1
Intensive-sociability (<i>int_sociability</i>)	25,731	0.145	0.35	0	1
	0	0.602	0.48	0	1
Extensive-sociability (<i>ext_sociability</i>)	1	0.250	0.43	0	1
	2	0.103	0.30	0	1
	3	0.035	0.18	0	1
	4	0.008	0.09	0	1
Financial advice (<i>fin_advice</i>)	18,287	0.318	0.46	0	1
Relative income (<i>relative_inc</i>)	68,231	1.217	1.38	0	1.999
Household annual income (<i>ln_income</i>)*	68,231	25,020	31,35	0	27,772,8
Employment status (<i>employment</i>)	67,278	0.248	0.43	0	1
Age (<i>age</i>)	68,219	67.15	10.29	24	105

Variable	Number of observations	Mean	Std. Dev.	Min.	Max.
Gender (<i>gender</i>)	68,231	0.435	0.49	0	1
Marital status (<i>marital_status</i>)	67,581	0.683	0.46	0	1
Household size (<i>hhd_size</i>)	68,231	2.17	1.02	1	15
	0	0.047	0.21	0	1
Educational attainment	1	0.360	0.48	0	1
	2	0.372	0.48	0	1
	3	0.218	0.41	0	1
Risk preferences (<i>risk_aversion</i>)	60,958	0.748	0.43	0	1

NOTES: *Household annual income variable is not in logs. In the case of the dichotomous variables, the value of the mean reports the percentage of people who fulfil the condition according to which the dichotomous variable takes the value equal to 1. *Sta. Dev.* stands for *standard deviation*; *Min.* for *Minimum*; and *Max.* for *Maximum*.

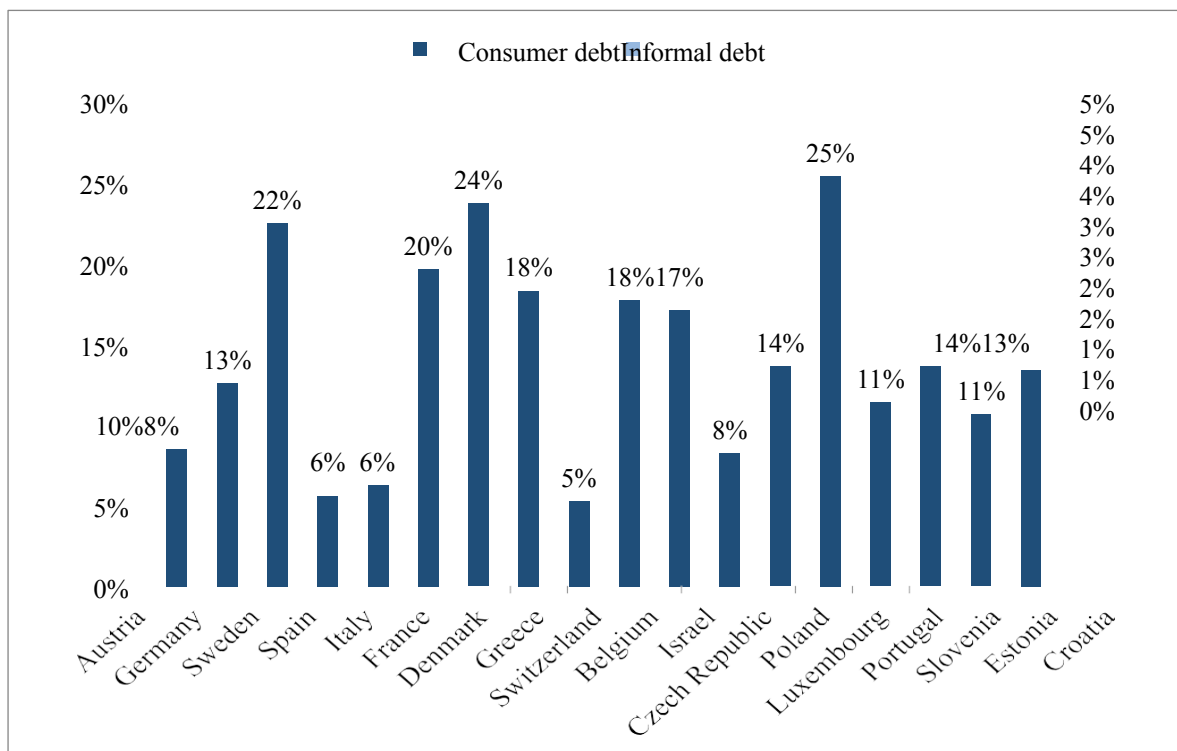
Graph 1 displays the average percentage of consumer and informal debt according to the individuals' sociability and the position of household income as regard the country median income. As regards consumer debt, 'sociable' individuals display greater rates of debt (17.6% for 'sociable' individuals, and

11.9% for 'non-sociable' individuals); while those household whose income is above the country median income seems to borrow more (17.52%) than those whose income is under the country median income (10.7%). When considering informal debt, the results are slightly different. In this case, 'sociable' individuals seem to borrow less than 'non-sociable' individuals, and household with income under the country median income seems to have more debts. Even though, the differences in the case of informal debt between the indebtedness rates are not considerable.



Graph 1. Debt across individuals' sociability and incomes
Source: *SHARE*.

More differences arise when considering the debt ratio in the countries that are part of the analysis (Graph 2), especially as regards consumer debts. While it reaches more than 20% in countries like Denmark, Luxembourg, and Sweden, in other countries (Austria, Czech Republic, Italy, Spain, and Switzerland) less of 10% of their population has consumer debts. Regarding informal debt, most of the countries are below 1.5%, excepting Greece, where 4.41% of its population has informal debts.



Graph 2: Type of debt by country
Source: *SHARE*.

5.2. MULTIVARIATE ANALYSIS: CONSUMER DEBT

Different empirical models were estimated in order to test the proposed hypotheses. Thus, Model 1

constitutes the base model that includes all control variables, Models 2-5 continue adding variables on sociability to test the *hypothesis 1*, and Models 6-10 add variables concerning relative income to test the *hypothesis 2*. Table 3 presents the estimated marginal effects.

Most of the results obtained allow to confirm *hypothesis 1*; i.e., empirical evidence supports that sociability positively influences household consumer debts. Specifically, sociability (*sociability*) and extensive-sociability (*ext_sociability*) variables display statistically significant and positive results, which are in line with the findings of Altundere (2014), Brown et al. (2016), Okten and Osili (2004) and Georganakos et al. (2014). Thus, an individual classified as 'sociable' have around 1.1% more probability of borrowing than a 'non-sociable' one. Similarly, the estimated marginal effects indicate that an individual who attends two social activities has, as compared to an individual who does not attend any social activity, 2.1% more probability of incurring consumer debts.

Likewise, 'intensive-sociability' (*int_sociability*) and financial advice (*fin_advice*) do not show any statistically significant effect, differing our results from the ones of Altundere (2014) and Georganakos et al. (2014), who find positive outcomes for both variables. The lack of significance of these variables could be partly due to their measurement, as Altundere (2014) measures 'intensive-sociability' using a monthly frequency -instead of a daily frequency-, and Georganakos et al. (2014) measure financial advice more directly.

In conclusion, empirical evidence reveals that the statistically significant effect of sociability resists changes in model specification (Agarwal et al., 2010). Besides, our findings suggest that sociability may increase household's consumer debt through direct information mechanisms (*word-of-mouth communication*). When a person interacts with others may exchange information about how to borrow, thus learning from each other in a direct and clear way (Liang and Guo, 2015; Manski 1993, 2000), and facilitating the access to credit.

Table 3. Consumers debts: probit estimates

	Hypothesis 1										Hypothesis 2			
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10				
age	-0.008*** (0.00)	-0.009*** (0.00)	-0.009*** (0.00)	-0.009*** (0.00)	-0.009*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.008*** (0.00)	-0.008*** (0.00)	-0.008*** (0.00)				
marital status	-0.010* (0.004)	-0.009* (0.004)	-0.002 (0.008)	-0.009* (0.004)	-0.018* (0.007)	-0.008 (0.004)	-0.010* (0.004)	-0.009* (0.004)	-0.012** (0.004)	-0.011** (0.004)				
Educational attainment	-0.013 (0.010)	-0.013 (0.011)	-0.018 (0.019)	-0.013 (0.011)	0.010 (0.029)	-0.016 (0.010)	-0.013 (0.010)	-0.015 (0.010)	-0.015 (0.010)	-0.015 (0.010)				
<i>education_0</i>	0.006 (0.004)	0.006 (0.004)	0.004 (0.008)	0.005 (0.004)	0.013 (0.008)	0.007 (0.004)	0.006 (0.004)	0.007 (0.004)	0.006 (0.004)	0.006 (0.004)				
<i>education_2</i>	0.003 (0.005)	0.000 (0.005)	0.003 (0.009)	-0.000 (0.005)	0.008 (0.009)	0.001 (0.005)	0.001 (0.005)	0.001 (0.005)	-0.000 (0.005)	0.000 (0.005)				
<i>education_3</i>	0.011*** (0.002)	0.011*** (0.002)	0.005 (0.005)	0.010*** (0.002)	0.013*** (0.004)	0.013*** (0.004)	0.013*** (0.004)	0.013*** (0.004)	0.013*** (0.004)	0.013*** (0.004)				
l_income	0.009 (0.004)	0.009* (0.005)	0.005 (0.009)	0.009* (0.005)	0.009 (0.008)	0.009* (0.005)	0.009* (0.005)	0.009* (0.004)	0.008 (0.005)	0.008 (0.005)				
risk_aversion	-0.003 (0.004)	-0.002 (0.004)	-0.004 (0.008)	-0.002 (0.004)	0.005 (0.006)	-0.002 (0.004)	-0.003 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)				
gender	0.018*** (0.003)	0.018*** (0.003)	0.021** (0.007)	0.018*** (0.003)	0.027*** (0.006)	0.017*** (0.003)	0.018*** (0.003)	0.017*** (0.003)	0.017*** (0.003)	0.017*** (0.003)				
hhd_size	0.013*** (0.002)	0.013*** (0.002)	0.010** (0.004)	0.013*** (0.002)	0.016*** (0.003)	0.013*** (0.002)	0.013*** (0.002)	0.013*** (0.002)	0.013*** (0.002)	0.013*** (0.002)				
Germany	0.015 (0.011)	0.016 (0.011)	0.048* (0.021)	0.016 (0.011)	0.010 (0.017)	0.016 (0.011)	0.016 (0.011)	0.017 (0.011)	0.017 (0.011)	0.017 (0.011)				
Sweden	0.172*** (0.015)	0.171*** (0.015)	0.218*** (0.029)	0.171*** (0.015)	0.191*** (0.021)	0.175*** (0.015)	0.170*** (0.015)	0.175*** (0.015)	0.176*** (0.015)	0.176*** (0.015)				
Spain	-0.035*** (0.010)	-0.035*** (0.010)	-0.017 (0.026)	-0.035*** (0.010)	-0.020 (0.021)	-0.041*** (0.010)	-0.033** (0.010)	-0.040*** (0.010)	-0.040*** (0.010)	-0.040*** (0.010)				
Italy	-0.046*** (0.009)	-0.044*** (0.009)	-0.002 (0.023)	-0.044*** (0.009)	-0.046* (0.018)	-0.047*** (0.009)	-0.043*** (0.009)	-0.046*** (0.009)	-0.046*** (0.009)	-0.046*** (0.009)				
France	0.109*** (0.013)	0.111*** (0.014)	0.125*** (0.027)	0.110*** (0.014)	0.141*** (0.021)	0.113*** (0.014)	0.111*** (0.014)	0.113*** (0.014)	0.113*** (0.014)	0.113*** (0.014)				
Denmark	0.119*** (0.014)	0.117*** (0.014)	0.112*** (0.024)	0.116*** (0.014)	0.122*** (0.019)	0.120*** (0.014)	0.116*** (0.014)	0.120*** (0.014)	0.121*** (0.014)	0.121*** (0.014)				

	Hypothesis 1					Hypothesis 2				
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
Greece	0.125*** (0.015)	0.130*** (0.016)	0.109*** (0.030)	0.131*** (0.016)	0.159*** (0.031)	0.128*** (0.015)	0.134*** (0.016)	0.129*** (0.015)	0.129*** (0.015)	0.129*** (0.015)
Switzerland	-0.062*** (0.009)	-0.063*** (0.009)	-0.021 (0.022)	-0.064*** (0.009)	-0.076*** (0.014)	-0.058*** (0.009)	-0.064*** (0.009)	-0.058*** (0.009)	-0.058*** (0.009)	-0.058*** (0.009)
Belgium	0.060*** (0.011)	0.061*** (0.011)	0.069** (0.021)	0.060*** (0.011)	0.075*** (0.017)	0.064*** (0.012)	0.061*** (0.011)	0.066*** (0.012)	0.066*** (0.012)	0.066*** (0.012)
Israel	0.123*** (0.019)	0.125*** (0.020)	0.170*** (0.041)	0.125*** (0.020)	0.155*** (0.032)	0.122*** (0.019)	0.126*** (0.020)	0.123*** (0.019)	0.124*** (0.020)	0.124*** (0.020)
Czech Republic	-0.006 (0.010)	-0.004 (0.011)	-0.003 (0.017)	-0.004 (0.011)	-0.037* (0.017)	-0.009 (0.010)	-0.003 (0.011)	-0.010 (0.010)	-0.010 (0.010)	-0.010 (0.010)
Poland	0.015 (0.020)	0.019 (0.021)	0.035 (0.049)	0.019 (0.021)	0.075 (0.055)	0.008 (0.020)	0.022 (0.021)	0.008 (0.020)	0.008 (0.020)	0.008 (0.020)
Luxembourg	0.120*** (0.016)	0.123*** (0.017)	0.117** (0.037)	0.122*** (0.017)	0.146*** (0.025)	0.133*** (0.017)	0.121*** (0.017)	0.134*** (0.017)	0.135*** (0.017)	0.135*** (0.017)
Portugal	0.026 (0.016)	0.032* (0.016)	0.027 (0.037)	0.033* (0.016)	0.086** (0.033)	0.026 (0.016)	0.036* (0.017)	0.026 (0.016)	0.026 (0.016)	0.026 (0.016)
Slovenia	0.047*** (0.012)	0.049*** (0.012)	0.074** (0.025)	0.049*** (0.012)	0.065** (0.020)	0.042*** (0.012)	0.050*** (0.012)	0.042*** (0.012)	0.042*** (0.012)	0.042*** (0.012)
Estonia	0.018 (0.010)	0.020 (0.011)	0.032 (0.019)	0.020 (0.011)	0.060** (0.020)	0.010 (0.010)	0.022 (0.011)	0.010 (0.010)	0.010 (0.010)	0.010 (0.010)
Croatia	0.093*** (0.015)	0.097*** (0.016)	0.051* (0.024)	0.097*** (0.016)	0.138*** (0.034)	0.077*** (0.014)	0.102*** (0.017)	0.078*** (0.014)	0.078*** (0.014)	0.078*** (0.014)
<i>sociability</i>		0.011** (0.004)				0.012** (0.004)	0.011** (0.004)	0.012** (0.004)	0.011** (0.004)	0.011** (0.004)
<i>fin_advice</i>			-0.010 (0.007)							
Extensive- sociability				0.008 (0.004)						
[Ref. ext_sociabilit y_0]				0.021*** (0.006)						
				0.015 (0.009)						
				0.002						

	Hypothesis 1					Hypothesis 2				
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
<i>int_sociability</i>				(0.016)	-0.005 (0.008)					
<i>relative_inc</i>						0.011*** (0.003)	-0.001 (0.005)			
<i>relative_inc²</i>						-0.001* (0.000)	-0.000 (0.000)			
<i>relative_inc_d</i>								-0.016*** (0.004)		
Income									0.015** (0.005)	
<i>inc_quartile_2</i>										
quartiles										
[Ref. <i>inc_quartile_3</i>									0.022*** (0.005)	
<i>inc_quartile_1</i>										
] <i>inc_quartile_4</i>									0.029*** (0.006)	
Income										-0.018*** (0.004)
<i>inc_grouped_1</i>										
grouped										
[Ref. <i>inc_grouped_3</i>										0.009* (0.004)
<i>inc_grouped_2</i>										
<i>N</i>	39.649	38.769	9.755	38.769	16.181	39.359	38.769	39.359	39.359	39.359
<i>Wald X² (d.f.)</i>	3802.34*** (27)	3731.52 ***(28)	1159.13*** (28)	3737.78*** (31)	1425.26 ***(28)	3781.81*** (29)	4335.59*** (30)	3778.03*** (28)	3783.02*** (30)	3782.74*** (29)
<i>Pseudolikelihood</i>	-14041.46	-13,887,952	-30,596,862	-13,885,245	67,411,818	-14130.81	-13886333	-14129944	-14124493	-14125279
<i>Hosmer Lemeshow X² (8 d.f.)</i>	13.54*	18.59**	5.68	18.43**	9.27	18.25**	19.61**	16.72**	20.57***	20.17***
<i>R² McFadden</i>	0.137	0.135	0.19	0.1356	0.1104	0.134	0.135	0.134	0.134	0.135

NOTES: the table shows the estimates on the probit models that estimate the effect of sociability and relative income on household indebtedness. In particular, the marginal effects of each estimate are identified. The levels of significance are given by * for 10%, ** for 5%, and *** for 1%. Robust standard errors are enclosed in parentheses. *d.f.* stands for the degrees of freedom.

Empirical evidence does not allow to confirm *hypothesis 2*. Contrary to expected, relative incomes seem to positively influence debt behaviour; i.e., the higher the household relative income, the greater the probability of borrowing. This probability increases at a decreasing rate, as it is shown by the negative sign of the square of relative income (Model 6). However, these statistically significant effects disappear when the model controls by households' income (Model 7).

The variables on income quartiles (*inc_quartile_#* and *inc_grouped_#*) reinforce the positive relationship between relative income and consumer debt. Moreover, the dummy variable on relative income (*relative_inc_d*) indicates that those individuals whose income is lower than the country median income are less likely to borrow.

These results differ from the findings of Christen and Morgan (2005) and Georgarakos et al. (2014). The difference may be motivated by the use of different databases and by the difference in the measurement of variables; namely, the measurement of relative income. In this regard, Georgarakos et al. (2014) use a question that explicitly measures the perception of relative income, as these authors ask directly about individuals' perception of the income of their peers in their social circle; while Christen and Morgan (2005) use the GINI index to measure differences in income.

However, the data obtained could be hiding another issue related to the offer on the credit market. Given that the estimates show that those individuals whose income is above the median income of their country are more likely to hold consumer debts, it could occur that higher incomes give individuals more power and easier access to the credit market.

To test this possible explanation, *hypothesis 2* is re-estimated in the next section using informal loans as independent variable.

5.3. MULTIVARIATE ANALYSIS: INFORMAL DEBT

Our results (see Table 4) confirm the *hypothesis 2* in the field of informal debt; i.e., the poorer the individuals perceive themselves in relation to others; the more likely they are to borrow from their family or friends. Besides, the marginal effect of the dummy variable on relative income and the categorical variables on income quartiles reinforce this relationship.

These results are in line with the findings of Christen and Morgan (2005) and Georgarakos et al. (2014). In this regard, Brown et al. (2016) and Putnam (2000) underline the important role that informal credit channels play in reducing financial problems and, particularly, these authors highlight that social networks can provide emotional and financial support for individuals.

It is noteworthy that sociability variable fails to be statistically significant in any of the estimated models. Therefore, empirical evidence does not allow to confirm the influence of sociability on informal debt.

Table 4. Informal debt: probit estimates

		M6	M7	M8	M9	M10
<i>age</i>		-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
<i>marital status</i>		-0.007*** (0.001)	-0.006*** (0.001)	-0.007*** (0.001)	-0.006*** (0.001)	-0.006*** (0.001)
Educational attainment	<i>education_0</i>	-0.001 (0.003)	0.000 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)
[Ref. education_1]	<i>education_2</i>	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
	<i>education_3</i>	-0.000 (0.002)	-0.000 (0.002)	-0.000 (0.002)	0.000 (0.002)	-0.000 (0.002)
<i>l_income</i>			0.000 (0.001)			
<i>employment</i>		-0.003* (0.001)	-0.002 (0.001)	-0.003* (0.001)	-0.002 (0.001)	-0.002 (0.001)
<i>risk_aversion</i>		0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
<i>gender</i>		0.003* (0.001)	0.002* (0.001)	0.003* (0.001)	0.003* (0.001)	0.003* (0.001)
<i>hhd_size</i>		0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)
<i>sociability</i>		-0.002 (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.002 (0.001)
Countries [Ref. Austria]	Germany	0.002 (0.004)	0.002 (0.003)	0.002 (0.004)	0.002 (0.004)	0.002 (0.004)
	Sweden	0.004 (0.004)	0.004 (0.004)	0.005 (0.004)	0.004 (0.004)	0.004 (0.004)
	Spain	0.001 (0.004)	0.001 (0.004)	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)
	Italy	0.003 (0.004)	0.002 (0.003)	0.003 (0.004)	0.003 (0.004)	0.003 (0.004)
	France	-0.001 (0.003)	-0.002 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)
	Denmark	0.005 (0.004)	0.004 (0.004)	0.005 (0.004)	0.005 (0.004)	0.005 (0.004)
	Greece	0.037*** (0.009)	0.033*** (0.009)	0.037*** (0.009)	0.037*** (0.009)	0.036*** (0.009)
	Switzerland	0.003 (0.004)	0.003 (0.004)	0.003 (0.004)	0.003 (0.004)	0.003 (0.004)
	Belgium	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)
	Israel	0.007 (0.007)	0.007 (0.007)	0.006 (0.007)	0.006 (0.007)	0.006 (0.007)
	Czech Republic	-0.000 (0.003)	-0.000 (0.003)	-0.000 (0.003)	0.000 (0.003)	0.000 (0.003)
	Poland	-0.002 (0.005)	-0.001 (0.005)	-0.002 (0.005)	-0.002 (0.005)	-0.002 (0.005)
	Luxembourg	-0.009*** (0.002)	-0.009*** (0.002)	-0.009*** (0.002)	-0.009*** (0.002)	-0.009*** (0.002)
	Portugal	0.008 (0.006)	0.007 (0.006)	0.008 (0.006)	0.008 (0.006)	0.008 (0.006)
	Slovenia	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.001 (0.003)
	Estonia	-0.003 (0.003)	-0.002 (0.003)	-0.003 (0.003)	-0.003 (0.003)	-0.003 (0.003)
Croatia	0.000 (0.004)	0.002 (0.004)	0.000 (0.004)	0.000 (0.004)	0.000 (0.004)	
<i>relative_inc</i>		-0.004*** (0.001)	-0.003* (0.001)			
<i>relative_inc²</i>		0.000*** (0.000)	0.000** (0.000)			
<i>relative_inc_d</i>				0.006*** (0.001)		

		M6	M7	M8	M9	M10
Income quartiles [Ref. inc_quartile_1]	<i>inc_quartile_2</i>				-0.004** (0.001)	
	<i>inc_quartile_3</i>				-0.006*** (0.001)	
	<i>inc_quartile_4</i>				-0.008*** (0.001)	
Income quartiles grouped [Ref. inc_grouped_2]	<i>inc_grouped_1</i>					0.005*** (0.001)
	<i>inc_grouped_3</i>					-0.004*** (0.001)
N		39.359	38.769	39.359	39.359	39.359
Wald X ² (d.f.)		483.9*** (29)	413.1*** (30)	487.1***(28)	494.7***(30)	480.6***(29)
Pseudolikelihood		-21,997,5	-20,943,7	-2,200,5	-21,944,7	-2,195,6
Hosmer Lemeshow X ² (8.d.f)		8.38	11.94	8.32	14.97*	10.14
R ² Mcfadden		0.099	0.089	0.0989	0.101	0.1008

NOTES: the table shows the estimates on the probit models that estimate the effect of sociability and relative income on household informal debts. In particular, the marginal effects of each estimate are identified. The levels of significance are given by * for 10%, ** for 5%, and *** for 1%. Robust standard errors are enclosed in parentheses. *d.f.* stands for the degrees of freedom.

Concerning the control variables, and regardless the type of debt, empirical evidence confirms that the decision to borrow is positively related to household size and male gender, and negatively related to the respondent's age and having a formal commitment -i.e., being married, living with the spouse or having a common-law relationship-. Additionally, household income positively affects the holding of consumer debt. Finally, country also matters in the decision of borrowing, especially in the case of consumer debt. Thus, 12 out of the 18 country variables show a statistically significant effect in the case of the consumer debt. These results point out that, once the effects of the respondents' own characteristics are discounted, the residents of each country have a greater (lower) probability of holding consumer debt that residents of Austria -the reference country-. Unlike consumer debt, only 2 country variables became significant in the models referred to informal debt. These results suggest that country-specific characteristics may be affecting formal debt more than informal debt. To avoid this bias, in the next section, *hypotheses 1 and 2* are re-analysed by country.

5.4. ROBUSTNESS ANALYSIS

In order to analyse whether sociability and relative income are still relevant in the different countries analysed, the global sample was divided into subsamples by country and the models 2, 6, 8 and 10 were re-estimated. Table 5 shows only marginal effects for independent variables of interest by country.

The effect of sociability on consumer debt presents some divergences when the analysis is carried out for each country. Thus, while sociability has a positive influence in Spain, Poland and Estonia, it has a negative influence in Denmark and Czech Republic. However, when informal debt is the dependent variable, the positive effect of sociability is found only in the Austrian case, whereas a negative effect is found in Belgium and Czech Republic. Therefore, *hypothesis 1* is far from being confirmed in all the countries analysed, nor in the case of consumer debt. Taking together, these findings suggest that those differences in the decision of holding consumer debt are more likely to reflect differences in country-level institutional factors rather than in individuals' sociability.

More agreement exists concerning the results referred to the relative income. Overall, regardless of how this relative income is measured, there is a positive relationship between relative income and consumer debts in nine of the countries analysed (namely, Sweden, Spain, France, Poland, Luxembourg, Slovenia, Estonia, Croatia and Belgium). These results, contrary to expected, could be suggesting that credit markets in these countries operate in a similar manner; i.e., access to credit (the offer) is more limited for low-income households. The exception would be Israel and Italy, where households with higher incomes are found to be less indebted.

Relative income variables confirm *hypothesis 2* in the case informal debt in many of the analysed countries. Households whose incomes are below the country's median income tend to be more indebted; being this relationship confirmed for Austria, Germany, Sweden, Spain, Italy, Greece, Switzerland and Belgium.

When deepening the analysis on relative income, significant effects are only found regarding one of the categories of the variable that groups income quartiles (*inc_grouped_#*), that could be indicating 'non-symmetrical' behaviours in the credit markets. That is, while in Greece it appears households in the upper income category have a greater probably of borrowing, in Spain are households in the lower income category the ones with the greatest probability (compared, in both cases, with those households whose average annual income belongs to the middle category -25-75%-). However, this effect should be further explored considering data on the credit supply; an issue that goes beyond the scope of this paper.

Finally, Table 6 illustrates the main findings regarding the variables of interest -i.e., sociability and relative income variables- on both types of loan.

Table 6. Summary of main findings

	Hvnothesis 1		Hvnothesis 2	
	Glo bal	Sample by countries	Glo bal	Sample by countries
Consu mer debt	(+)	(+): 3 countries (17 % of sample countries) (-): 2 countries (50% of	(+)	(+): 9 countries (50% of sample countries) (-) 2 countries
Informal debt	()	(+): 1 country (6% of sample countries) (-): 2 countries (50% of sample	(-)	(-): 8 countries (44% of sample countries) (+) 2 countries

Note: (+/ - /) denotes positive/negative/not significant effect on debt.

To sum up, the sociability effect on borrowing -despite the type of debt- cannot be confirmed when the analysis is carried out by country, as the empirical evidence found is not enough. On the contrary, the effect of relative income persists even when the analysis is carried out by country, even though maintaining a different effect depending on the type of debt -consumer or informal debt- considered. In this sense, the higher the income level, the lower the probability of incurring informal debt and the higher the probability of incurring consumer debt. This apparently contradictory effect may be due to a different nature, in terms of complexity and financial risk, of both kinds of debt.

6. CONCLUSIONS

As discussed at the outset, household debt is increasingly important, hence the need for literature to delve deeper into the investigation of what influences on households get into debt; and thus avoiding situations of over-indebtedness. The extant research has analyzed debt decisions from different approaches. In this paper, we pay attention to social interactions on households' borrowing behaviour, particularly, we stay focused on the effect of individuals' sociability and relative income.

Drawing on previous literature on social interactions and financial decisions, this paper analyzes the underlying mechanisms through which sociability operates to influence on households' debts in a sample of 68,500 people from 19 European countries -from the sixth wave of SHARE-. It should be noted that the study distinguishes two types of households' debts, namely, consumer debts and informal debts. The results show that the effect of sociability on households' debt depends on the type of debt -consumer or informal debt- and what are those underlies mechanisms -communication or observation-.

As previous studies have shown (e.g., Altundere, 2014), our findings confirm that individuals who are sociable - sociability measure as a direct process of informal communication-, are more likely to maintain consumer debts. However, informal debts are not influenced by sociability when it operates through that mechanism. Borrowing on informal debts is negatively associated with individuals' relative incomes, i.e., when sociability reflects learning based on observation. Individuals who perceived themselves poorer than others are more likely to borrow from peers.

Furthermore, our results suggest that the effect of sociability on consumer and informal debts shows some discrepancies when the analysis is carried out for country. So we don't find strong enough empirical evidence for it. Concerning the relative incomes the behaviour of individuals is maintained. Households with incomes below the country's median tend to be more informal indebted. Conversely, it is confirmed that the higher the incomes of households, the more likely they are to contract consumer debt.

The study has important implications for individuals and public policy outcomes. First, from the different educational levels and sectors education on debt tenure can be promoted. They should be responsible for teaching the advantages and disadvantages of different types of households' debts and the risks of each. Second, government, with its economic policies, can also incline individuals to hold more or less debt and to select one type or another of it. For governments it is not a minor issue,

since, as we previously noted, household debt has implications for family finances, but also for the global economy - connected with lower output growth or higher unemployment-.

This paper also presents some limitations. In particular, although the sixth wave of the SHARE is the most complete in terms of social aspects, we have already recognized its problems regarding the financial risk preferences variable and the income variables due to the amount of lost values that there are in those questions. Therefore, we recognize the difficulty to assess those variables and the need to use earlier versions of SHARE. Future research should try to avoid questions that are too specific or that intimidate the individual in order to answer them. Secondly, sociability and incomes level variables have been constructed on the basis of existing questions in the questionnaire. Future studies should benefit from measuring these variables more directly. On the other hand, the most common control variables in households' debts field study were considered; however, it may be that the effect of sociability and income level on consumer debts and informal debts may be influenced by more and other control variables that should be considered in future studies.

In short, for a variety of reasons, social interaction is a growing phenomenon in the lives of individuals that conditions many of their attitudes and behaviours. Borrowing behaviours are no exception. Therefore, we need a better understanding of the influence of sociability on this type of behaviour, to prevent over-indebtedness situations and to improve the individuals' financial well-being.

REFERENCES

- AGARWAL, S., & HAUSWALD, R. (2010). Distance and private information in lending. *The Review of Financial Studies*, 23(7), 2757-2788.
- ALTUNDERE, M.B. (2014). The Relationship Between Sociability and Household Debt.
- BECKER-OLSEN, K.L., CUDMORE, B.A., & HILL, R.P. (2006). The impact of perceived corporate social responsibility on consumer behavior. *Journal of business research*, 59(1), 46-53.
- BROWN, J. R., IVKOVIĆ, Z., SMITH, P.A., & WEISBENNER, S. (2008). Neighbors matter: Causal community effects and stock market participation. *The Journal of Finance*, 63(3), 1509-1531.
- BROWN, S., GHOSH, P., & TAYLOR, K. (2016). Household Finances and Social Interaction: Bayesian Analysis of Household Panel Data. *Review of Income and Wealth*, 62(3), 467- 488.
- BÖRSCH-SUPAN, A. (2017). Survey of health, ageing and retirement in Europe (SHARE) wave 5. *Release version*, 5(0).
- CHRISTEN, M., & MORGAN, R.M. (2005). Keeping up with the Joneses: Analyzing the effect of income inequality on consumer borrowing. *Quantitative Marketing and Economics*, 3(2), 145-173.
- COLLINS, D., MORDUCH, J., RUTHERFORD, S., & RUTHVEN, O. (2010). *Portfolios of the poor: how the world's poor live on \$2 a day*. Princeton University Press
- DUESENBERY, J.S. (1967). *Income, saving, and the theory of consumer behavior* (Vol. 180). Oxford University Press.
- FERNÁNDEZ-LÓPEZ, S., REY-ARES, L., & VIVEL-BÚA, M. (2018). The role of internet in stock market participation: just a matter of habit? *Information Technology & People*, 31(3), 869-885.
- GABA, A., & KALRA, A. (1999). Risk behavior in response to quotas and contests. *Marketing Science*, 18(3), 417-434.
- GENTRY, L.C. (2013). The Jones Effect: Quantifying the Effect of Social Norms on Satisfaction. *World*, 3(1).
- GEORGARAKOS, D., HALIASSOS, M., & PASINI, G. (2014). Household debt and social interactions. *The Review of Financial Studies*, 27(5), 1404-1433.
- GRANOVETTER, M. (1983). Granovetter, M. (1983). The Strength of Weak Ties: A Network Theory Revisited. *Sociological Theory*, 1, 201.
- HONG, H., KUBIK, J.D., & STEIN, J.C. (2004). Social interaction and stock-market participation. *The journal of finance*, 59(1), 137-163.
- LIANG, P., & GUO, S. (2015). Social interaction, Internet access and stock market participation—An empirical study in China. *Journal of Comparative Economics*, 43(4), 883-901.
- MANSKI, C.F. (1993). Identification of endogenous social effects: The reflection problem. *The review of economic studies*, 60(3), 531-542.
- MANSKI, C.F. (2000). Economic analysis of social interactions. *Journal of economic perspectives*, 14(3), 115-136.
- MIAN, A., SUFI, A., & VERNER, E. (2017). Household debt and business cycles worldwide. *The Quarterly Journal of Economics*, 132(4), 1755-1817.
- MORENO-HERRERO, D., SALAS-VELASCO, M., & SÁNCHEZ-CAMPILLO, J. (2017). Individual pension

- plans in Spain: how expected change in future income and liquidity constraints shape the behavior of households. *Journal of Family and Economic Issues*, 38(4), 596-613.
- OECD (2019), Household debt (indicator). doi: 10.1787/f03b6469-en
- OKTEN, C., & OSILI, U.O. (2004). Social networks and credit access in Indonesia. *World Development*, 32(7), 1225-1246.
- PUTNAM, R.D. (2000). Bowling alone: America's declining social capital. In *Culture and politics* (pp. 223-234). Palgrave Macmillan, New York.
- STIGLITZ, J.E., & WEISS, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review*, 71(3), 393-410.

THE EFFECT OF SELF-CONTROL UPON PARTICIPATION IN VOLUNTARY PENSION SCHEMES

SANDRA CASTRO-GONZÁLEZ

Assistant Professor (0000-0002-8206-1776) Department of Business Organization and Commercialisation. Universidade de Santiago de Compostela/Faculty of Business Administration Campus de Lugo. Avda. Alfonso X El Sabio, s/n. 27002 – Lugo/sandra.castro@usc.es

LUCÍA REY-ARES

Assistant Professor (0000-0002-5165-742X) Business Department/Universidade da Coruña Faculty of Humanities and Documentation/Campus de Esteiro, s/n. 15403 – Ferrol/lucia.rey.ares@udc.es

SARA FERNÁNDEZ-LÓPEZ

Associate Professor (0000-0003-2496-4333) Department of Financial Economics and Accounting/Universidade de Santiago de Compostela/Faculty of Economics and Business. 15782 – Santiago de Compostela (Spain)/sara.fernandez.lopez@usc.es

DJAMILA DAOUDI

PhD Student (0000-0003-2815-1866) Department of Financial Economics and Accounting/Universidade de Santiago de Compostela/Faculty of Economics and Business. 15782 – Santiago de Compostela (Spain)/djamiladaoudi@rai.usc.es

Abstract

Population ageing, together with the recent economic downturn and its aftermath, are giving considerable cause for concern as regards the future sustainability of public pension systems. Voluntary pension schemes emerge here as an alternative to supplement the public pension pillar, and therefore, understanding how individuals make their financial decisions when participating in voluntary pension schemes becomes a question of key importance. There is a growing literature aimed at analysing this issue, but few references to date have analysed the effect of behavioural traits over participation in voluntary pension schemes. Particularly, the analysis of the effect of self-control over this financial decision will be the aim of this paper. Based on data from the *International Survey of Adult Financial Literacy*, this paper analyses, through probit regression models, the effect of financial self-control, besides other control variables -e.g., gender-, on the tenure of financial assets for retirement savings. Empirical evidence reveals that higher levels of financial self-control are positively associated with savings for retirement. Moreover, when this variable is considered, the statistically significant effect of other driving forces traditionally highlighted by previous literature disappears. Therefore, our empirical evidence supports the need of considering behavioural issues to explain individuals' financial decisions.

Key Words: self-control, driving forces, saving for retirement, OECD/INFE toolkit, Spain.

JEL: G40, G41

1. INTRODUCTION

The sustainability of the public pension pillar is based on the behaviour of three main factors, namely: the demography, the labour market and the rules governing the distribution of the pension. In this regard, population ageing, together with the recent economic downturn and its aftermath, is giving considerable cause for concern as regards the future sustainability of the public pension pillar. Therefore, understanding how individuals make their financial decisions when participating in voluntary pension schemes, and ultimately, understanding whether this alternative might constitute a real option to supplement retirement savings obtained from the public pension pillar, is a question of key importance for economists and policy makers.

Previous literature acknowledges the influence of psychological and attitudinal traits in the management of personal finances (Achtziger, et al. 2015; Farrell, Fry & Risse, 2016). Hershey (2004) states that although demographic traits do influence retirement saving decisions, their effect is mediated through the psyche, thus recognizing the importance of psychological traits. Among these traits, the self-control, understood as the restraint exercised over one's own impulses, desires, or emotions, has emerged as one of the driving forces of financial decisions (Gathergood, 2012). There is evidence pointing that the lack of self-control is responsible for many individual and societal problems, such as impulse-control problems, procrastination, or overspending (Achtziger et al., 2015; Baumeister, Vohs & Tice, 1994).

But in spite of this evidence, few references to date have analysed the influence of self-control on the decision to invest in retirement assets (Strömbäck et al., 2017). To the best of our knowledge, only three papers have explicitly addressed this relationship (Ameriks et al. 2007; Hira et al., 2009; Kimball & Shumway, 2009), without finding strong empirical evidence supporting it. In this regard, these papers present two major limitations. Firstly, they use one or two-item scales to measure a complex concept such as self-control; and secondly, they do not consider financial literacy as a driving force of retirement assets.

This paper aims to fill these gaps in the literature. Under the theoretical lens of the behavioural life-cycle hypothesis, it explores how individuals' self-control, together with other control variables, influences their decision to invest in retirement assets. Using a sample of 8,554 Spanish individuals in 2015, we first construct and validate a multi-item scale of financial self-control by applying Exploratory Factorial Analysis (EFA) and other methodological verifications. Second, we test whether the effect of individuals' self-control affects their decision to hold retirement assets. And, finally, the robustness of this relationship is tested by controlling for the individuals' level of financial literacy.

This paper contributes to the literature in several ways. Firstly, it expands the recent literature investigating the effect of self-control on saving for retirement, which is still rather limited (Strömbäck et al., 2017). Secondly, we construct a multi-item scale measure of self-control based on a higher number of specific financial questions than previous research. In so doing, we add to the literature that claims to design a reliable self-control measure for financial studies (Lown, 2011). Thirdly, by controlling for financial literacy, we reduce the omitted variable bias problem.

Fourthly, unlike previous studies, we use a larger and more diverse sample, which leads to more robust results (Farrell et al., 2016). Finally, we find empirical evidence of the effect of self-control on holding retirement assets. With these results in mind, several recommendations to improve households' financial behaviour are proposed.

The remainder of the paper is structured as follows. After this introductory section, Section 1 presents the literature review. Section 2 describes the methodology and the econometric approach. Section 3 discusses the empirical outcome, and finally, Section 4 summarises the concluding remarks.

2. LITERATURE REVIEW

Self-control can be defined as the individual's ability to control his/her own impulses, emotions and desires, especially in difficult circumstances. This concept is also characterised, as Gathergood (2012) states, as a time-inconsistency problem. In this regard, an inadequate self-control might lead individuals to follow first or dominant impulses or to not being able to resist temptations.

The proposal of self-control as a potential driving force of households' saving and consumption decisions was suggested by Shefrin & Thaler (1988), when they formulated the behavioural life-cycle (BLC) hypothesis. This hypothesis constitutes an extension of the traditional life-cycle model of Modigliani & Brumberg (1954), aimed at overcoming some of its limitations. Namely, Shefrin & Thaler (1988) indicated that individuals were not as rational as the Modigliani & Brumberg (1954) model predicted, stating that individuals have to face two conflicting forces; i.e., one that focus on the long-term and other, myopic, that focus on the short-term or current situation. And here self-control emerges as a driving force aimed at controlling the individuals' own impulses regarding their consumption behaviour, in order to foster savings. Thus, the ability to control impulses and emotions can influence the individuals' decision-making (Atkinson & Messy, 2011), entailing individuals to successfully manage their personal finances (Farrell et al., 2016)

In this regard, empirical evidence confirms that the lack of self-control is related with bad financial behaviours, such as lack of saving (Kimball & Shumway, 2009; Lown et al., 2015), over-indebtedness (Gathergood, 2012), unhealthy credit card-use (Sotiropoulos & d'Astous, 2013; Wang, Lu & Malhotra, 2011), or lack of financial help-seeking (Lim et al., 2014), among others. Although the relationship between self-control and financial behaviours has rapidly grown in importance over the last ten years, several financial behaviours such as saving for retirement have been underexplored in the empirical literature (Strömbäck et al., 2017). To the best of our knowledge, Ameriks et al. (2007), Kimball & Shumway (2009) and Hira et al. (2009) are the only papers that explicitly address this relationship.

More specifically, using a sample of 320 Americans, Kimball & Shumway (2009) found that the lack of self-control, measured through two items mainly focused on purchasing behaviour, negatively influences not only the individual's overall savings but also the retirement savings. In contrast, Ameriks et al. (2007) found, for a sample of 362 American households, that self-control problems do not influence the amount of savings in retirement assets. These last authors construct a measure of self-control problems by proposing several questions concerning a hypothetical choice scenario.

Hira et al (2009) also studied a sample of 911 high-income American households in 2005. The authors used a five-point scale variable representing individuals which like to plan for the future as a proxy of perceived self-control. Similarly to Ameriks et al. (2007), the empirical results failed to confirm self-control as a significant driving force of the decision to hold retirement assets.

According to Ameriks et al. (2007), the lack of a statistically significant effect of self-control on retirement savings in two out of the three above-mentioned studies can be partially explained by the fact that retirement savings tend to be illiquid assets. In this respect, it might be harder to avoid the temptation to consume liquid assets (e.g., money in current accounts), whereas illiquid ones (e.g., voluntary pension plans, life insurances...) tend to be less affected by self-control problems. However, in this paper we add two other potential explanations for this lack of significance. Firstly, the measures of self-control used by Ameriks et al. (2007) and Hira et al. (2009) are mostly based on questions related to choice or planning behaviour, rather than focused on financial behaviours. Moreover, the three above-mentioned papers use one or two-item scales to measure self-control, which could be a rather limited approach to capture financial self-control. Secondly, none of the three studies have considered financial literacy as a correlate, in spite that a plenty of studies have proved that the individual's financial literacy affects the decision to save for retirement (Lusardi & Mitchell, 2011; Ricci & Caratelli, 2017).

To sum up, the few studies on the topic have hardly found empirical evidence confirming the relationship between self-control and investment in retirement assets. In this paper, we construct a robust measure of self-control from questions specifically aimed at collecting information from financial behaviours (i.e., a financial self-control measure) and control by the individuals' level of financial literacy when estimating the effect of correlates on the decision to save for retirement. From this empirical approach and drawing on the arguments stemming from the BLC hypothesis, we propose that the individual's self-control do influence the probability of holding retirement assets; being this our working hypothesis.

3. METHODOLOGY

Data comes from the *International Survey of Adult Financial Literacy*, a questionnaire-based survey developed by the OECD *International Network on Financial Education* (INFE). This survey is aimed at collecting information on financial literacy and financial inclusion in different OECD countries. Particularly, this paper focus on a sample comprised of 8,554 Spanish individuals interviewed in 2015.

3.1. SELF-CONTROL MEASUREMENT: EXPLORATORY FACTORIAL ANALYSIS (EFA)

The review of previous literature reveals a lack of consensus regarding the conceptualization of self-control. As Achtziger et al. (2015) point out, self-control is measured in some cases as a general psychological resource capable of controlling the thoughts or impulses of individuals; but in other cases, it is measured through more specific issues, such as money spending behaviour or self-reported measures of self-control.

The lack of a homogeneous conceptualization of self-control is also reflected in the lack of agreement when it comes to its measurement. Thus, most of previous literature on financial behaviour uses a single-item scale to measure self-control; but there is also no agreement when it comes to operationalize that item. Thus, Hira et al. (2009) operationalize self-control through an item related to planning for the future, whereas Gathergood (2012) and Gathergood & Weber (2014) consider an item related to the purchasing power and the purchasing decision. A second group of studies, although the minority, considers self-control as a multi-item variable. However, once more, there is not full accord with the multi-item scale. Finally, a third group of studies -e.g., Strömbäck et al. (2017)-, use a combination of more personal or psychological items proposed by Tangney et al. (2004) and financial items are related to the proposal of Antonides De Groot & Van Raaij (2011). To the best of our knowledge, Antonides et al. (2011) are one of the first authors to attempt to develop a self-control scale in the field of finance. Their items are closely related to the short-term orientation of individuals.

After reviewing the available literature on financial behaviour and self-control, two main shortcomings have been identified regarding the constructed scales of self-control. Firstly, these scales are either based on questions concerning personal, psychological, and/or motivational issues (i.e., 'general self-control'), or on questions on financial issues (i.e., 'financial self-control'). Secondly, the latter scales -i.e., the ones based on financial issues- are constructed based exclusively on a specific financial behaviour, such as the use of credit cards or money spending. Both shortfalls limit the ability of self-control scales to capture the complexity of the concept. In order to overcome them, we have created and validated a new self-control scale, assuming that it should be a multi-item scale with general financial questions. In so doing, we used Exploratory Factorial Analysis (EFA) and other methodological verifications as shown next.

The methodological process to identify the latent dimensionality of self-control and develop the scale was EFA. Initially, to determine the factors we introduced twelve attitudinal and behavioural statements where people have to select a position in a five-point Likert scale (from 1 -completely agree- to 5 -completely disagree-). Four factors were extracted, but two of them were automatically discarded because their factor loadings were too low. After analysing the content of the two remaining factors, only one of them, related to financial self-control, stood out.

In a second step, a second factorial analysis was carried out with the items of the selected factor. Kaiser-Meyer-Olkin (KMO) returned a result of 0.643 and Bartlett's Test of Sphericity was significant ($p < 0.000$); i.e., both values were considered appropriate (Hair et al., 2006), which confirmed the suitability of our data for factor analysis.

EFA used principal component analysis as extraction methodology to simplify the factor structure and Varimax as rotation method. The communalities were above 0.528, which suggests that the items adequately explain the variance of the original items. The factors explain 58.43% of scale total variance. It is composed by three items with loadings ranging from the lowest of 0.727 to the highest of 0.801.

Cronbach's alpha is 0.642, which shows a good internal consistency of the scale.

Table 1 summarizes all EFA information.

Table 1. Factor analysis and reliability of self-control scale

	Cross factor loadings	Item to total correlation	Cronbach's alpha
Self-control <i>KMO= 0.643; Eigenvalue: 1.753</i>			
I tend to live for today and let tomorrow take care of itself	0.764	0.583	0.642
I find it more satisfying to spend money than to save it for the long term	0.801	0.641	
Money is there to be spent	0.727	0.528	

Scale reliability was confirmed, so we proceeded to create a new variable where all items converge. Low or negative values for the created variable represent low levels of self-control, whereas high or positive values correspond to high levels of self-control.

3.2. DEFINITION AND MEASUREMENT OF THE VARIABLES

The independent variable of the analysis is the decision to hold retirement assets (RET_ASSET). It is measured as a dummy variable taking the value 1 if the individual, either personally or jointly, held any pension or retirement product - excluding compulsory products- at the time of the interview; and value 0 otherwise.

The main independent variable deals with the individual's level of self-control. In this respect, two measures are used. First, the SELFC variable is the continuous variable constructed by applying the EFA, as described in previous section. Second, similarly to Strömbäck et al (2017), a dummy variable (SEFC_D) is also created. The SELF_C variable takes the value 1 for those individuals whose self-control estimated score (SELFC) is above the median level of self-control; and 0 otherwise.

The remaining independent variables are control variables which have been often highlighted by the financial literature as potential drivers of the decision to save for retirement. Most of them are dummy variables that have been re-coded from the original questionnaire. Table 2 contains more detailed information concerning the definition of these independent variables.

Table 2. Variable definitions

VARIABLES	DEFINITION
Retirement assets (<i>RET_ASSET</i>)	Dummy variable set to 1 if the respondent, personally or jointly, holds a pension or retirement product -excluding compulsory products-; and to 0 otherwise.
Self-control (<i>SELFC</i>)	Continuous variable constructed by applying the EFA
Self-control (<i>SELFC_D</i>)	Dummy variable set to 1 if the self-control estimated score (<i>SELFC</i>) is above the median level of self-control; and to 0 otherwise.
Gender (<i>GENDER</i>)	Dummy variable set to 1 if the respondent is female; and to 0 if male
Age ¹ (<i>LNAGE</i> ; <i>LNAGE</i> ²)	Natural logarithm of the respondent's age (in years)
Employment situation (<i>EMPLOY #</i>)	Respondent's current employment situation is: Employed or self-employed (1) [reference category]; Unemployed (2); Retired (3); In other situation -including looking after the home; unable to work due to sickness or ill-health; not working and not looking for work; student and other- (4)
Income bracket (<i>INCOME #</i>)	Respondent's household yearly income bracket is : Below 14,500 euros (1) [reference category]; Between 14,500 and 45,000 euros (2) Above 45,000 euros (3)
Educational attainment (<i>EDU #</i>)	Respondent's formal education consists of six levels: No formal education (1) [reference category]; Complete primary education (2); Some secondary education (3); Complete secondary education (4); Technical/vocational education (5); University education (6)
Children under 18 (<i>CHILD18_D</i>)	Dummy variable set to 1 if the respondent (or his/her partner) has children under the age of 18 living in the household; and to 0 otherwise
Marital status (<i>MARRIED</i>)	Dummy variable equal to 1 if the respondent is married and living with spouse or has a registered partnership; and to 0 otherwise
Financial literacy ² (<i>ABC_D</i>)	Dummy variable set to 1 if the respondent correctly answers the three internationally comparable questions on financial literacy proposed by Lusardi (2008) and commonly known as the "ABC" or "core" of financial literacy; and to 0 otherwise

Notes: ¹*LNAGE*² variable was included in order to capture potential non-linearities ² The three questions known as the "core" of financial literacy refer to the concepts of interest compounding, real vs. nominal returns, and portfolio diversification.

3.3. ESTIMATION STRATEGY

This paper is aimed at analyzing the effect of self-control upon the decision to invest in retirement assets. To accomplish this objective, the multivariate analysis involves a two- stage process. In the first stage, after applying EFA, as previously stated, a scale for measuring individuals' self-control is defined. In the second stage, a probit model is used to model a non-linear relationship between the dummy dependent variable and a set of independent variables -among these latter, the scale created in the first stage is introduced as an explanatory variable-.

The probit model specification is set as follows:

$$\text{Probability } (Y_i = 1) = \phi (\beta_0 + \beta_1 \text{Self-control}_i + \beta_j \text{Control_variables}_i)$$

The dependent variable (Y_i) quantifies the individual's probability of holding retirement assets, i is the index of the individual, and ϕ denotes the standard normal distribution function. *Self-control* refers to both the scale of individual's self-control and the dummy variable for self-control. *Control_variables* refers to the set of control variables defined in Table 2.

4. EMPIRICAL RESULTS

4.1. UNIVARIATE ANALYSIS

Summary statistics of selected dependent and independent variables are displayed in Table 3. Final sample comprises 8,554 individuals with an average age of 47 years, and an almost equal gender distribution. Most of respondents are married (65.7%) and about one third of them (30.7%) have children under the age of 18 at home. Concerning educational attainment, 22.8% of respondents have completed secondary education, 27.2% primary education, and 22.3% tertiary education, while the remaining percentage corresponds to individuals who have no formal education (2.4%) or another type of education. Almost half of the sample is employed or self-employed (53.1%) and their households' average annual income ranges between €14,500 and €45,000 (50.5%). Only 23.9% have invested in voluntary retirement assets, while a lower percentage, close to one-fifth of the sample (18.3%), answered correctly all questions on financial literacy.

Focusing on self-control, about 52.4% of the sample are individuals whose level of self-control is above the median level of self-control. Most of them are women (53.6%), married (69.6%) and a 34.5% have children under the age of 18 years. On the other hand, those who can be considered individuals with low self-control are mostly men (53.6%),

married (61.3%) and the majority (73.4%) do not have children under the age of 18. Regarding to educational attainment, there are no major differences between individuals with high self-control and individuals with low self-control; neither regarding financial literacy.

Finally, as concern employment and economic situation, both subsamples behave similarly. And finally, as regards retirement assets, respondents with high self-control hold a slightly higher percentage (26.4%) of these assets than respondents with low self-control (21.1%).

Table 3. Descriptive statistics: global sample and subsamples

Variable		GLOBAL SAMPLE			SUBSAMPLE SELF_D=0			SUBSAMPLE SELF_D=1		
		Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
RET_ASSET		7,678	0.239	0.427	3,588	0.211	0.408	4,090	0.264	0.441
GENDER		8,554	0.502	0.500	4,073	0.464	0.499	4,481	0.536	0.499
AGE*		8,554	47.22	15.77	4,073	47.50	16.38	4,481	46.97	15.19
EMPLOY	1	8,553	0.531	0.499	4,072	0.499	0.500	4,481	0.561	0.496
	2	8,553	0.138	0.345	4,072	0.145	0.352	4,481	0.133	0.339
	3	8,553	0.161	0.367	4,072	0.188	0.391	4,481	0.136	0.343
	4	8,553	0.169	0.375	4,072	0.168	0.374	4,481	0.171	0.376
INCOME	1	7,720	0.361	0.480	3,680	0.376	0.484	4,040	0.347	0.476
	2	7,720	0.505	0.500	3,680	0.506	0.500	4,040	0.504	0.500
	3	7,720	0.134	0.341	3,680	0.118	0.323	4,040	0.149	0.356
EDU	1	8,552	0.024	0.152	4,072	0.028	0.165	4,480	0.020	0.140
	2	8,552	0.150	0.357	4,072	0.163	0.369	4,480	0.138	0.345
	3	8,552	0.272	0.445	4,072	0.286	0.452	4,480	0.259	0.438
	4	8,552	0.228	0.419	4,072	0.236	0.424	4,480	0.221	0.415
	5	8,552	0.104	0.305	4,072	0.097	0.296	4,480	0.109	0.312
	6	8,552	0.223	0.417	4,072	0.190	0.393	4,480	0.254	0.435
CHILD18_d		8,551	0.307	0.461	4,071	0.266	0.442	4,480	0.345	0.475
MARRIED		8,551	0.657	0.475	4,071	0.613	0.487	4,480	0.696	0.460
SELF		8,491	0.000	1.000	4,073	-0.840	0.683	4,418	0.775	0.491
SELF_D		8,554	0.524	0.499						
ABC_D		8,554	0.183	0.387	4,073	0.173	0.378	4,481	0.192	0.394

NOTES: AGE variable is not in logs. In the case of the dummy and factor variables, the value of the mean reports the percentage of people who fulfill the condition according to which those variables take the value equal to 1. *Obs.* and *Std. Dev.* stand for *observations* and *standard deviation*, respectively

4.2. MULTIVARIATE ANALYSIS

To test the effect of self-control on the decision to invest in retirement assets, different empirical models are estimated. Model 1 constitutes the base model including all the control variables. Models 2 and 3 include the continuous and dummy variables measuring the individuals' self-control, respectively. Model 4 and 5 add the dummy variable referred to financial literacy, and Model 6 incorporates the interaction term between self-control and financial literacy. Table 4 displays the estimated marginal effects of the six econometric models.

Table 4. Holding retirement assets: probit estimates

	M1	M2	M3	M4	M5	M6
GENDER	-0.026** (0.010)	-0.028** (0.010)	-0.027** (0.010)	-0.024* (0.010)	-0.023* (0.010)	-0.023* (0.010)
LNAGE	4.324*** (0.649)	4.259*** (0.647)	4.355*** (0.646)	4.240*** (0.645)	4.332*** (0.644)	4.331*** (0.644)
LNAGE ²	-0.526*** (0.086)	-0.517*** (0.086)	-0.530*** (0.086)	-0.515*** (0.086)	-0.527*** (0.085)	-0.527*** (0.085)
EMPLOY [Ref. 1]	2 -0.083*** (0.014)	-0.083*** (0.014)	-0.082*** (0.014)	-0.082*** (0.014)	-0.081*** (0.014)	-0.081*** (0.014)
	3 -0.139*** (0.016)	-0.139*** (0.016)	-0.137*** (0.016)	-0.138*** (0.016)	-0.136*** (0.016)	-0.136*** (0.016)
	4 -0.091*** (0.015)	-0.094*** (0.015)	-0.091*** (0.015)	-0.094*** (0.015)	-0.091*** (0.015)	-0.091*** (0.015)
INCOME [Ref. 1]	2 0.100*** (0.012)	0.100*** (0.012)	0.101*** (0.012)	0.099*** (0.012)	0.100*** (0.012)	0.100*** (0.012)
	3 0.271*** (0.021)	0.270*** (0.021)	0.272*** (0.021)	0.265*** (0.021)	0.266*** (0.021)	0.266*** (0.021)
EDU [Ref. 1]	2 0.053 (0.057)	0.047 (0.058)	0.05 (0.057)	0.046 (0.058)	0.049 (0.057)	0.049 (0.057)
	3 0.099† (0.055)	0.094† (0.055)	0.096† (0.055)	0.092† (0.056)	0.094† (0.055)	0.094† (0.055)
	4 0.169** (0.060)	0.163** (0.060)	0.166** (0.060)	0.157** (0.060)	0.160** (0.060)	0.160** (0.060)
	5 0.142* (0.063)	0.136* (0.063)	0.138* (0.063)	0.130* (0.063)	0.132* (0.063)	0.133* (0.063)
	6 0.187** (0.061)	0.180** (0.062)	0.182** (0.061)	0.170** (0.062)	0.172** (0.061)	0.173** (0.062)
	CHILD18_D	0.007 (0.012)	0.006 (0.012)	0.005 (0.012)	0.006 (0.012)	0.005 (0.012)
MARRIED	-0.004 (0.012)	-0.006 (0.012)	-0.007 (0.012)	-0.006 (0.012)	-0.007 (0.012)	-0.007 (0.012)
SELF		0.012* (0.005)		0.012* (0.005)		
SELF_D			0.028** (0.009)		0.028** (0.009)	0.027* (0.011)
ABC_D				0.030* (0.012)	0.031** (0.012)	0.028 (0.018)
SELFABC_D						0.005 (0.022)
N	6,946	6,911	6,946	6,911	6,946	6,946
Wald X ² (d.f.)	815.61*** (15)	827.64*** (16)	834.12*** (16)	834.26*** (17)	841.52*** (17)	842.01*** (18)
Pseudolikelihood	-3165.19	-3152.1	-3160.71	-3148.85	-3157.28	-3157.26
Hosmer-Lemeshow X ² (8 d.f.)	15.44	14.51	16.66*	19.95*	14.87	15.24
R ² Mcfadden	0.173	0.174	0.175	0.175	0.175	0.175

NOTES: Table 4 shows the probit estimates of holding pension or retirement assets. Namely, the marginal effect of each estimate is identified. The variables LNAGE and LNAGE2 are expressed in its logarithmic form.

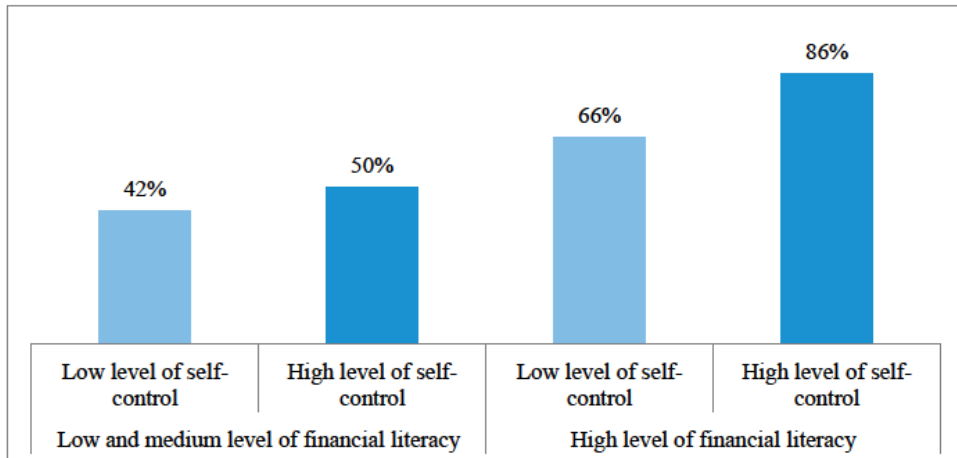
The levels of significance are given by † for 1%, * for 5%, ** for 1%, and *** for 0.1%. Robust standard errors are enclosed in parentheses. *d.f.* stands for the degrees of freedom.

Most of the results obtained confirm the proposed hypothesis; i.e., a high level of self-control is positively associated with holding pension or retirement assets. Particularly, the estimates indicate that an individual with a level of self-control over the median has around 2.8% higher probability of investing in retirement assets, compared with an individual with a low self-control. These results are consistent with the findings of Kimbal and Shumway (2009).

Unlike previous studies on the relationship between self-control and retirement savings, our analyses incorporate a variable capturing the individual's level of financial literacy. In this respect, a non-negligible number of empirical studies have found strong evidence of the effect of financial literacy on this financial behaviour (e.g., Ricci & Caratelli, 2017), as also confirms our empirical evidence. Besides, even controlling for the individuals' financial literacy (Lusardi, 2008), the self-control variable remains statistically significant and positively related to holding retirement assets.

In this respect, some authors insist that the effect of self-control on financial behaviours can be affected by the individual's financial literacy (Farrell et al., 2016; Strömbäck et al., 2017). To test whether the effect of self-control differs depending on individuals' financial literacy, Model 5 is re-estimated by interacting the dummy variable on self-control with that on financial literacy. Whereas, the variable concerning self-control remains statistically significant and positively related to the investment in retirement assets, the financial literacy variable does not seem to be significant. Similarly, the interaction term between self-control and financial literacy fails to be statistically significant. However, in the probit models, this lack of significance does not necessarily imply that the interaction effect is zero (Norton, Wang & Ai, 2004), since in nonlinear models the magnitude of the interaction effect does not equal the marginal effect (Ai & Norton, 2003).

To go further on this issue, we compute the mean marginal effect and significance level of the interaction terms using Stata's *inteff* command (Norton et al., 2004), that are displayed in Graph 1. The results confirm that both the individual's self-control and financial literacy positively influence the decision to invest in retirement assets. Moreover, the results seem to indicate that the level of self-control exerts its influence on the probability of holding retirement assets, especially among those individuals who display high levels of financial literacy. However, this 'incremental' effect diminishes its impact in the sample composed of individuals with low and medium levels of financial literacy.



Graph 1. Marginal effects of the interaction's terms

Additionally, as regards the control variables, empirical evidence allows us to confirm that the decision to hold pension or retirement assets is positively related to households' income level and individuals' educational attainment and age; even though the effect of age decreases as the individual ages, thus showing an inverted U-shape. As compared to those who are employed or self-employed, people in other employment situation have lower probabilities of holding pension or retirement assets. Empirical evidence also reveals the women are less likely than men to hold retirement assets. The remaining control variable fail to be significant.

5. CONCLUSIONS

Population ageing has long been pointed out as a threat to the sustainability of Spanish public pension system; a threat that in the aftermath of the most recent financial crisis became even more explicit. In this regard, private retirement savings constitute an available option to improve this sustainably, what motivated an extensive research into the driving forces of this financial decision. This research has considered different approaches - e.g., demographic, socioeconomic...- to understand the mechanisms behind this decision; however, little research has been done on the effect of personality and behavioural driving forces.

This paper is aimed at demonstrating that the ability of individuals to control its emotions and impulses related to money -i.e., the individuals' self-control- and the individuals' knowledge regarding financial concepts -i.e., financial literacy- play a role in the decision to hold retirement assets. Drawing on the behavioural life-cycle hypothesis, the results of the estimated probit models confirm that higher levels of financial self-control are positively associated with retirement savings.

Empirical evidence has also revealed that self-control acts together with other control variables such as financial literacy. In this regard, financially literate individuals who display high levels of self-control are more likely to hold voluntary pension or retirement assets, compared to financially literate individuals with low levels of self-control. In other words, it can be said that self-control leverages the

probability of holding pension on retirement assets among financial literate individuals. However, among those with low levels of financial literacy, this incremental effect is much lesser.

The findings of this study have major policy and managerial implications. The first implication is the need to educate individuals about financial issues and provide them with the tools that generate confidence to assume their own financial decisions and risks. Nevertheless, improving individuals' financial literacy is not enough. The second implication that emerges from the analysis is the relevance of improving the ability of individuals to properly manage and control their own money. This will be conditioned by the individual's level of self-control when making financial decisions. In this respect, it is necessary to supplement financial education by providing individuals with strategies to control their own impulses when making financial decision; and here, psychology might play a role. A third implication refers to financial institutions, especially those in the fintech industry, that need to seriously consider the role played by self-control in financial behaviours. The design of apps for financial issues should ethically include filters to prevent the individual's 'first impulse', as well as tools to foster long-term saving habits.

Despite its contributions, this paper presents some potential limitations that open the way for future research. Firstly, this study is based on cross-sectional data; and therefore, to arrive at causality conclusions future studies should be based on longitudinal data. Secondly, a sample of Spanish individuals is considered; whereas future studies could replicate the study to other countries and make comparative analysis. Finally, although we have used a more complete measure of self-control than previous studies, there is a possibility that some important aspects of the variable have been omitted.

REFERENCES

- ACHTZIGER, A. HUBER, M., KENNING, P., RAAB, G., & REISCH, L. (2015). Debt out of control: The links between self-control, compulsive buying, and real debts. *Journal of Economic Psychology*, 49, 141-149. doi: 10.1016/j.joep.2015.04.003
- AI, C., & NORTON, E. C. (2003). Interaction terms in logit and probit models. *Economics Letters*, 80(1), 123-129. doi: 10.1016/s0165-1765(03)00032-6
- AMERIKS, J., CAPLIN, A., LEAHY, J., & TYLER, T. (2007). Measuring self-control problems. *American Economic Review*, 97(3), 966-972. doi: 10.1257/aer.97.3.966
- ANTONIDES, G., DE GROOT, I. M., & VAN RAAIJ, W. F. (2011). Mental budgeting and the management of household finance. *Journal of Economic Psychology*, 32(4), 546- 555. doi: 10.1016/j.joep.2011.04.001
- ATKINSON, A., & MESSY, F. A. (2011). Assessing financial literacy in 12 countries: an OECD/INFE international pilot exercise. *Journal of Pension Economics & Finance*, 10(4), 657-665. doi: 10.1017/s1474747211000539
- BAUMEISTER, R.F., VOHS, K.D., & TICE, D.M. (1994). The strength model of self-control. *Current Directions in Psychological Science*, 16(6), 351-355. doi: 10.1111/j.1467-8721.2007.00534.x
- FARRELL, L., FRY, T.R.L., & RISSE, L. (2016). The significance of financial self-efficacy in explaining women's personal finance behaviour. *Journal of Economic Psychology*, 54, 85-99. doi: 10.1016/j.joep.2015.07.001

- GATHERGOOD, J. (2012). Self-control, financial literacy and consumer over-indebtedness. *Journal of Economic Psychology*, 33, 590-602. doi: 10.1016/j.joep.2011.11.006
- GATHERGOOD, J., & WEBER, J. (2014). Self-control, financial literacy & the co-holding puzzle. *Journal of Economic Behavior & Organization*, 107, 455-469. doi: 10.2139/ssrn.2005031
- HAIR, J. F., BLACK, W. C., BABIN, B. J., ANDERSON, R. E., & TATHAM, R. L. (2006). *Multivariate data analysis*. Uppersaddle River.
- HERSHEY, D. A. (2004). Psychological influences on the retirement investor. *CSA: Certified Senior Advisor*, 22, 31-39.
- HIRA, T. K., ROCK, W. L., & LOIBL, C. (2009). Determinants of retirement planning behaviour and differences by age. *International Journal of Consumer Studies*, 33(3), 293-301. doi: 10.1111/j.1470-6431.2009.00742.x
- KIMBALL, M., & SHUMWAY, T. (2009). Fatalism, Locus of Control and Retirement Saving. University of Michigan.
- LIM, H., HECKMAN, S., MONTALTO, C. P., & LETKIEWICZ, J. (2014). Financial stress, self-efficacy, and financial help-seeking behavior of college students. *Journal of Financial Counseling and Planning*, 25(2), 148-160.
- LOWN, J. M. (2011). Development and validation of a financial self-efficacy scale. *Journal of Financial Counseling and Planning*, 22(2), 54-64.
- LOWN, J.M., KIM, J., & GUTTER, M.S. (2015). Self-efficacy and Savings Among Middle and Low Income Households. *Journal of Family and Economic Issues*, 36, 491-502. doi: 10.1007/s10834-014-9419-y
- LUSARDI, A. (2008). *Financial literacy: an essential tool for informed consumer choice?* Working Paper, Dartmouth College. doi: 10.3386/w14084
- LUSARDI, A., & MITCHELL, O. (2011). Financial literacy and retirement planning in the United States. *Journal of Pension Economics and Finance*, 10(4), 509-525. doi: 10.1017/S147474721100045X
- MODIGLIANI, F., & BRUMBERG, R. (1954). Utility analysis and the consumption function; an interpretation of cross-section data. In: K. KURIHARA (Ed.). *Post-Keynesian Economics* (pp. 388-436). New Jersey: Rutgers University Press.
- NORTON, E. C., WANG, H., & AI, C. (2004). Computing interaction effects and standard errors in logit and probit models. *The Stata Journal*, 4(2), 154-167. doi: 10.1177/1536867x0400400206
- RICCI, O., & CARATELLI, M. (2017). Financial literacy, trust and retirement planning. *Journal of Pension Economics and Finance*, 16(1), 43-64. doi: 10.1017/S1474747215000177
- SOTIROPOULOS, V., & D'ASTOUS, A. (2013). Attitudinal, self-efficacy, and social norms determinants of young consumers' propensity to overspend on credit cards. *Journal of Consumer Policy*, 36(2), 179-196. doi: 10.1007/s10603-013-9223-3
- STRÖMBÄCK, C., LIND, T., SKAGERLUND, K., VÄSTFJÄLL, D., & TINGHÖG, G. (2017). Does self-control predict financial behavior and financial well-being? *Journal of Behavioral and Experimental Finance*, 14, 30-38. doi: 10.1016/j.jbef.2017.04.002
- SHEFRIN, H.M., & THALER, R.H. (1988). The behavioral life-cycle hypothesis. *Economic Enquiry*, 66, 609-643. doi: 10.1111/j.1465-7295.1988.tb01520.x
- TANGNEY, J. P., BAUMEISTER, R. F., & BOONE, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72(2), 271-324. doi: 10.1111/j.0022-3506.2004.00263.x

WANG, L., LU, W., & MALHOTRA, N. K. (2011). Demographics, attitude, personality and credit card features correlate with credit card debt: A view from China. *Journal of Economic Psychology*, 32(1), 179-193. doi: 10.1016/j.joep.2010.11.006



RAISE REGRESSION: TYPES OF RAISING AND MEAN SQUARE ERROR

JOSÉ GARCÍA PÉREZ

Departamento de Economía y Empresa/Facultad de Ciencias Económicas y Empresariales
Universidad de Almería/Carretera Sacramento, s/n, La Cañada. Almería (España)
jgarcia@ual.es

CATALINA B. GARCÍA GARCÍA

Departamento de Métodos Cuantitativos para la Economía y la Empresa/Facultad de Ciencias
Económicas y Empresariales/Universidad de Granada
Campus Universitario de La Cartuja, 18071 - Granada (España)/cbgarcia@ugr.es

ROMÁN SALMERÓN GÓMEZ

Departamento de Métodos Cuantitativos para la Economía y la Empresa/Facultad de Ciencias
Económicas y Empresariales/Universidad de Granada
Campus Universitario de La Cartuja, 18071 - Granada (España)/romansg@ugr.es

Resumen

Los procedimientos de alzado fueron presentados por García et al. (2011) y desarrollados por Salmerón et al. (2017) con el objeto de mitigar la colinealidad mediante la transformación geométrica de la matriz X asociada a un modelo de regresión. Posteriormente, se han presentado distintos tipos de alzamiento entre el que destaca el estimador alzado sucesivo. Este trabajo analiza el comportamiento del estimador alzado sucesivo en relación con la admisibilidad del error cuadrático medio en comparación con el estimador de mínimos cuadrados ordinarios y el estimador cresta.

Palabras clave: Multicolinealidad, Regresión cresta, Regresión alzada, admisibilidad de MSE.

Abstract

The procedures of raising were presented by Garcia et al. (2011) and developed by Salmerón et al. (2017) to treat collinearity by the geometrical transformation of the matrix X associated to a regression model. Latter, different types of raising were presented highlighting the successive raise estimator. This paper analyses the behaviour of the successive raise estimator in relation to mean squared error admissibility compared to the ordinary least squares estimatos and the ridge estimator..

Key Words: Multicollinearity, Ridge regression, Raise regression, MSE admissibility.

Área o eje Temático 9: Economía Cuantitativa para la Economía y la Empresa

1. INTRODUCCION

Se dice que existe colinealidad aproximada en un modelo de regresión lineal cuando hay una fuerte relación entre sus regresores. En esta situación, el estimador de Mínimos Cuadrados Ordinarios (MCO) ofrece resultados inestables, por lo que no se recomienda su uso. Existen diferentes métodos alternativos a MCO para estimar modelos de regresión lineal bajo la existencia de multicolinealidad, entre los que destaca el estimador cresta propuesto por Hoerl y Kennard (1970a,b) mediante la siguiente expresión:

$$\hat{\beta}_r(k) = (X'X + kI)^{-1} X'Y, \quad (1)$$

donde el parámetro k es mayor o igual a cero. Este método, que ha sido ampliamente usado en la literatura, surgió inicialmente con el objetivo de mejorar el error cuadrático medio del estimador y estabilizar las estimaciones obtenidas.

Por otra parte, el estimador alzado fue presentado por García et al. (2011) como una alternativa al estimador cresta para estimar modelos con colinealidad. Posteriormente, se han desarrollado distintos tipos de alzado tales como el estimador alzado simultaneo (SiR), García et al. (2014), y el estimador alzado sucesivo (SuR), García y Ramírez (2017). Recientemente, García et al. (2019) concluye, entre otras cuestiones, que el estimador SuR es el más recomendable ya que garantiza que el factor inflador de la varianza de todas las variables (alzadas y no alzadas disminuye) por lo que se asegura la mitigación de la colinealidad. Este artículo compara el comportamiento del estimador alzado sucesivo en términos del error cuadrático medio con el estimador de mínimos cuadrados ordinarios y el estimador cresta. En la sección 2 se revisa el procedimiento de obtención del estimador alzado sucesivo, en la sección 3 se desarrollan y demuestran las proposiciones necesarias para comprar los estimadores según el criterio de error cuadrático medio. Por último, la sección 4 presenta las conclusiones del trabajo.

2. ESTIMADOR ALZADO SUCESIVO

Por simplicidad, partimos del siguiente modelo estandarizado con n observaciones y dos variables exógenas estandarizadas ($p = 3$):

$$y = \beta_1 x_1 + \beta_2 x_2 + u, \quad (2)$$

García et al. (2011) sugieren alzar la variable x_1 teniendo en cuenta la relación $x_1 = x_1 + \lambda e_1$, donde $\lambda \geq 0$, x_1 es el vector alzado de x_1 y e_1 es el vector de residuos obtenido a partir de la regresión de x_1 sobre la variable x_2 . Es decir, $e_1 = x_1 - \rho x_2$ siendo ρ el coeficiente de correlación entre x_1 y x_2 . Entonces, $x_1 = x_1 + \lambda(x_1 - \rho x_2)$. Téngase en cuenta que la correlación entre los vectores

\mathbf{x}_1 y \mathbf{x}_2 es más débil que entre los vectores \mathbf{x}_1 and \mathbf{x}_2 debido a que el ángulo es mayor. Véase Figura 1.

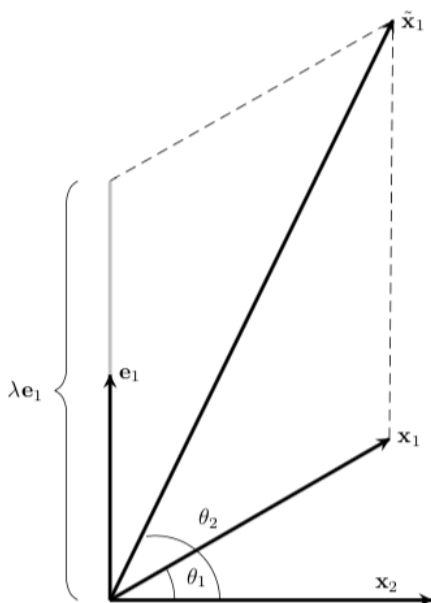


Figura 1. Representación de la interpretación geométrica de la regresión alzada

García y Ramírez (2017) proponen el siguiente procedimiento para obtener el estimador de alzado sucesivo. A partir de $\mathbf{x}_1 = \mathbf{x}_1 + \lambda_1 \mathbf{e}_1 = \mathbf{x}_1 + \lambda_1 (\mathbf{x}_1 - \rho \mathbf{x}_2)$, \mathbf{x}_2 se alza considerando que $\mathbf{x}_2 = \mathbf{x}_2 + \lambda_2 \mathbf{e}_2$, donde \mathbf{e}_2 es el residuo obtenido a partir de la regresión $\mathbf{x}_2 = \alpha \mathbf{x}_1 + \mathbf{v}$.

Teniendo en cuenta que $\hat{\alpha} = \frac{\rho}{1 - \lambda_1(\lambda_1 + 2)(\rho^2 - 1)}$ se obtiene que:

$$\begin{aligned} \mathbf{x}_2 &= \mathbf{x}_2 + \lambda_2 (\mathbf{x}_2 - \hat{\alpha} \mathbf{x}_1) = \\ &= \frac{(\lambda_1 + 1)\lambda_2 \rho}{\lambda_1(\lambda_1 + 2)(\rho^2 - 1) - 1} \mathbf{x}_1 - \frac{\lambda_1(1 - \rho^2)[(\lambda_1 + 1)(\lambda_2 + 1) + 1] + (\lambda_1 + 1)\lambda_2 + 1}{\lambda_1(\lambda_1 + 2)(\rho^2 - 1) - 1} \mathbf{x}_2. \end{aligned}$$

Denotando \mathbf{X}_{SUR} a la matriz obtenido a partir del alzado sucesivo, las matrices asociadas presentan las siguientes expresiones respectivamente:

$$\mathbf{X}'_{SuR} \mathbf{X}_{SuR} = \begin{pmatrix} 1 + \lambda_1(\lambda_1 + 2)(1 - \rho^2) & \rho \\ \rho & 1 + \frac{(\lambda_1 + 1)^2 \lambda_2(\lambda_2 + 2)(1 - \rho^2)}{1 - \lambda_1(\lambda_1 + 2)(1 - \rho^2)} \end{pmatrix}$$

$$\mathbf{X}'_{SuR} \mathbf{y} = \begin{pmatrix} (1 + \lambda_1)\gamma_1 - \gamma_2 \rho \lambda_1 \\ \frac{\gamma_2 \lambda_1(\lambda_2 \lambda_1 + \lambda_1 + \lambda_2 + 2)\rho^2 + \gamma_1(\lambda_1 + 1)\lambda_2 \rho - \gamma_2(\lambda_1 + 1)^2(\lambda_2 + 1)}{(\rho^2 - 1)\lambda_1(\lambda_1 + 2) - 1} \end{pmatrix}$$

3. COMPARACION EN TERMINOS DE MSE

Seguendo a Theobald (1974) se puede decir que dado un modelo de regresión lineal $y = X\beta + u$, es posible comparar dos estimadores de la forma $\hat{\beta}_i = C_i y$ con $i = 1, 2$ aplicando el criterio de la matriz del error cuadrático medio (MtxECM) definido como:

$$MtxECM(\beta) = E \left[(\beta - \hat{\beta}) (\beta - \hat{\beta})' \right]. \quad (3)$$

Dada la siguiente expresión

$$\Delta = MtxECM(\beta_2) - MtxECM(\beta_1) \quad (4)$$

Si la matriz Δ es definida o semidefinida positiva, entonces el estimador β_1 será más apropiado que el estimador β_2 . También se verifica que $\theta = MSE(\beta_2) - MSE(\beta_1) \geq 0$. Entonces, es posible concluir que β_1 es mejor que β_2 en términos del ECM..

De acuerdo a Farebrother (1976), la expresión (4) se puede reescribir como:

$$\Delta = \sigma^2 \mathbf{S} - Bias(\beta_1) Bias(\beta_2) \quad (5)$$

donde $\mathbf{S} = \mathbf{C}_2 \mathbf{C}_2' - \mathbf{C}_1 \mathbf{C}_1'$.

A partir de la expresión anterior y siguiendo el teorema 2.2.2 de Trenklar (1980), se obtienen los siguientes resultados:

Proposición 1. Siendo $\beta_i = C_i y$, con $i = 1, 2$, dos estimadores lineales β tales que S es una matriz definida positiva. Además, dando como válida la siguiente relación:

$$\beta' (C_1 X - I_p)' S^{-1} (C_1 X - I_p) \beta < \sigma^2, \quad (6)$$

entonces $\Delta = \text{MtxECM}(\beta_2) - \text{MtxECM}(\beta_1) > 0$.

Se verifica que si S es una matriz definida positiva, basándose en la Proposición es posible afirmar que el estimador β_1 es mejor que el estimador β_2 bajo el criterio de la matriz del error cuadrático medio. Véase Theobald (1974), Farebrother (1976) y Trenklar (1980).

Entonces, a partir de la proposición 1, es posible comparar los estimadores β , β_{SuR} y $\beta_R(k)$ bajo el criterio de la matriz del error cuadrático medio.

Proposición 2. El estimador de alzado sucesivo $\beta_{SuR} = (\tilde{X}'_{SuR} \tilde{X}_{SuR})^{-1} \tilde{X}'_{SuR} y$ donde $\tilde{X}'_{SuR} \tilde{X}_{SuR} = X'X + kI$, es preferido al estimador de mínimos cuadrados ordinarios, $\beta = (X'X)^{-1} X'y$, bajo el criterio de la matriz del error cuadrático medio para valores de k que verifiquen la siguiente expresión:

$$\beta' \left[(\tilde{X}'_{SuR} \tilde{X}_{SuR})^{-1} \tilde{X}'_{SuR} X - I \right] \frac{1}{k} (X'X + kI) X'X \left[(\tilde{X}'_{SuR} \tilde{X}_{SuR})^{-1} \tilde{X}'_{SuR} X - I \right] \beta < \sigma^2$$

Demostración:

Considerando $C_1 = (\tilde{X}'_{SuR} \tilde{X}_{SuR})^{-1} \tilde{X}'_{SuR} = (X'X + kI)^{-1} \tilde{X}'_{SuR}$ y $C_2 = (X'X)^{-1} X'$, y solo reemplazando C_1 y C_2 , se puede demostrar que $C_2 C_2' C_1 C_1' = (X'X)^{-1} - (X'X + kI)^{-1}$. También se verifica que esta matriz es definida positiva. Véase Puntanen (2011). Por otra parte, teniendo en cuenta que la inversa de la suma de dos matrices A y B se define como:

$$(A + B)^{-1} = A^{-1} - (I + A^{-1}B)^{-1} A^{-1}BA^{-1} \quad (7)$$

Se puede demostrar que:

$$(\mathbf{C}_2 \mathbf{C}_2' \mathbf{C}_1 \mathbf{C}_1')^{-1} = \left[(\mathbf{X}'\mathbf{X})^{-1} (\mathbf{X}'\mathbf{X} + k\mathbf{I}) \right]^{-1} = k (\mathbf{X}'\mathbf{X} + k\mathbf{I})^{-1} (\mathbf{X}'\mathbf{X})^{-1}.$$

Dado que $\mathbf{X}'\mathbf{X} + k\mathbf{I}$ y $\mathbf{X}'\mathbf{X}$ son matrices definidas positivas y k es positiva, entonces su producto será una matriz definida positiva. Basándose en el resultado mostrado en la proposición 1, es posible concluir β_{SuR} satisface la condición de admisibilidad del ECM, asegurando así una mejora en el ECM para $k > 0$.

Proposición 3. El estimador cresta $\beta_R(k) = (\mathbf{X}'\mathbf{X} + k\mathbf{I})^{-1} \mathbf{X}'\mathbf{y}$ es preferido sobre el estimador alzado sucesivo, $\beta_{SuR} = \left(\mathbf{X}'_{SuR} \mathbf{X}_{SuR} \right)^{-1} \mathbf{X}'_{SuR} \mathbf{y}$ donde $\mathbf{X}'_{SuR} \mathbf{X}_{SuR} = \mathbf{X}'\mathbf{X} + k\mathbf{I}$, bajo el criterio de la matriz del error cuadrático medio para los valores de k que satisfacen la siguiente expresión:

$$\beta' \left[(\mathbf{X}'\mathbf{X} + k\mathbf{I})^{-1} \mathbf{X}'\mathbf{X} - \mathbf{I} \right] \frac{1}{k} (\mathbf{X}'\mathbf{X} + k\mathbf{I}) \left[(\mathbf{X}'\mathbf{X} + k\mathbf{I})^{-1} \mathbf{X}'\mathbf{X} - \mathbf{I} \right] \beta < \sigma^2,$$

Demostración:

Definiendo $\mathbf{C}_1 = (\mathbf{X}'\mathbf{X} + k\mathbf{I})^{-1} \mathbf{X}'\mathbf{y}$

$\mathbf{C}_2 = \left(\mathbf{X}'_{SuR} \mathbf{X}_{SuR} \right)^{-1} \mathbf{X}'_{SuR} \mathbf{y} = (\mathbf{X}'\mathbf{X} + k\mathbf{I})^{-1} \mathbf{X}'_{SuR} \mathbf{y}$, se demuestra que

$$\mathbf{C}_2 \mathbf{C}_2' - \mathbf{C}_1 \mathbf{C}_1' = (\mathbf{X}'\mathbf{X} + k\mathbf{I})^{-1} \left[\mathbf{I} - \mathbf{X}'\mathbf{X} (\mathbf{X}'\mathbf{X} + k\mathbf{I})^{-1} \right].$$

A partir de (7) se obtiene que:

$$(\mathbf{X}'\mathbf{X} + k\mathbf{I})^{-1} = (\mathbf{X}'\mathbf{X})^{-1} - \left[k(\mathbf{X}'\mathbf{X})^{-1} + \mathbf{I} \right]^{-1} (\mathbf{X}'\mathbf{X})^{-1} k(\mathbf{X}'\mathbf{X})^{-1}$$

Entonces,

$$\left[\mathbf{I} - \mathbf{X}'\mathbf{X} (\mathbf{X}'\mathbf{X} + k\mathbf{I})^{-1} \right] =$$

$$k(\mathbf{X}'\mathbf{X})^{-1} \left[k(\mathbf{X}'\mathbf{X})^{-1} + \mathbf{I} \right]^{-1} (\mathbf{X}'\mathbf{X})^{-1} (\mathbf{X}'\mathbf{X})^{-1} = k \left\{ \left[(\mathbf{X}'\mathbf{X})^2 + k(\mathbf{X}'\mathbf{X}) \right] (\mathbf{X}'\mathbf{X})^{-1} \right\}^{-1} = k \left[(\mathbf{X}'\mathbf{X}) + k\mathbf{I} \right]^{-1}.$$

En conclusión, se obtiene que $\mathbf{C}_2\mathbf{C}'_2 - \mathbf{C}_1\mathbf{C}'_1 = k[(\mathbf{X}'\mathbf{X}) + k\mathbf{I}]^{-1}$ es una matriz definida positiva si $k > 0$.

4. CONCLUSIÓN

Basándose en proposición 1, se concluye que en relación con el criterio de la matriz del error cuadrático medio, el estimador cresta es preferido al estimador de alzado sucesivo $\hat{\beta}_{SuR}$ para $k \in (0, +\infty)$. Sin embargo, hay que destacar que no garantiza que se haya mitigado el problema de multicolinealidad.

REFERENCIAS

- FAREBROTHER, R. W. (1976). Further results on the mean square error of ridge regression. *Journal of the Royal Statistical Society. Series B (Methodological)*, 38(3), 248-250.
- GARCIA, C.; GARCÍA, J.; SOTO, J. (2011) The raise method. An alternative procedure to estimate the parameters in presence of collinearity. *Quality & Quantity*, vol. 45, no 2, p. 403-423.
- GARCÍA, J., GARCÍA, C. B., LÓPEZ, M. D. M., SALMERÓN, R. (2014). El método de alzado sucesivo y su relación con el método cresta. In *Anales de economía aplicada 2014* (pp. 1323-1338). Asociación Española de Economía Aplicada, ASEPELT.
- GARCÍA, J., LÓPEZ, M. D. M., GARCÍA, C. B., SALMERÓN, R. (2019). A geometrical interpretation of collinearity: a natural way to justify ridge regression and its anomalies. *International Statistical Review*, submitted.
- GARCIA, J.; RAMIREZ, D. E. (2017) The successive raising estimator and its relation with the ridge estimator. *Communications in Statistics-Theory and Methods*, 46, no 22, p. 11123-11142.
- HOERL, A.E.; KENNARD, R.W. (1970a): Ridge Regression: Biased Estimation for Northogonal Problems. *Technometrics*, 12(1):55-67.
- HOERL, A.E.; KENNARD, R.W. (1970b): Ridge Regression: Applications to Northogonal Problems. *Technometrics*, 12(1):69-82.
- PUNTANEN, S., STYAN, G. P., ISOTALO, J. (2011). *Matrix tricks for linear statistical models: our personal top twenty*. Springer Science & Business Media.
- SALMERON, R., GARCIA, C., GARCIA, J., LOPEZ, M. D. M. (2017). The raise estimator estimation, inference, and properties. *Communications in Statistics-Theory and Methods*, 46(13), 6446-6462.
- THEOBALD, C. M. (1974). Generalizations of mean square error applied to ridge regression. *Journal of the Royal Statistical Society: Series B (Methodological)*, 36(1), 103-106.
- TRENKLAR, G. (1980). Generalized mean squared error comparisons of biased regression estimators. *Communications in Statistics-Theory and Methods*, 9(12), 1247-1259.

ANÁLISIS COSTE/EFFECTIVIDAD DEL TRATAMIENTO FARMACO TERAPEUTICO DEL CÁNCER DE PULMÓN EN UN HOSPITAL UNIVERSITARIO DE ESPAÑA

OCTAVIO CÓRDOVA ARÉVALO

Universidade de Vigo/PEMEX

FRANCISCO REYES SANTÍAS

GEN/Universidade de Vigo/IDIS/Sergas

DAVID VIVAS CONSUELO

CIEGS/Universidad Politécnica de Valencia

1. JUSTIFICACIÓN

El cáncer de pulmón es la enfermedad resultante del crecimiento anormal de células en el tejido pulmonar. Proveniente de células epiteliales, este crecimiento generalmente maligno, puede derivar en metástasis e infiltración a otros tejidos del cuerpo. El cáncer de pulmón es clasificado en dos tipos principales, en función del tamaño y apariencia de la células malignas: el cáncer pulmonar de células pequeñas (microcítico) y el de células no pequeñas (no microcítico). Esta distinción condiciona el tratamiento y así, mientras el primero por lo general, es tratado con quimioterapia y radiación, el segundo tiende a serlo además, mediante cirugía, láser y terapia fotodinámica. (Sociedad Americana del Cáncer, 2001).

A nivel mundial, el cáncer de pulmón es la forma más frecuente de cáncer en términos de incidencia y de mortalidad causando cerca de 1.0 - 1.18 millones de muertes cada año, con las tasas más elevadas en países de Europa y Norteamérica. (Sociedad Americana del Cáncer, 2001).

Una de las principales causas de muerte en países desarrollados es el cáncer de pulmón, en España durante el 2007 se registraron 19.992 casos y en Galicia 1.436 lo que representa el 7,18% siendo esta la quinta Comunidad Autónoma que presenta estos casos después de Andalucía, Cataluña, Comunitat Valenciana y Comunidad de Madrid a nivel nacional. Según las estadísticas en 2007 de la OMS (Organización Mundial de la Salud), el MSPS (Ministerio de Sanidad y Política Social), España tiene una Esperanza de vida al nacer de 81 años.

La quimioterapia es el uso de fármacos anticancerosos para destruir las células cancerosas por todo el cuerpo. Aun después de que se haya extirpado el cáncer del pulmón, células cancerosas pueden todavía estar presentes en el tejido cercano o en otra parte del cuerpo. La quimioterapia se puede usar para controlar el crecimiento del cáncer o para aliviar los síntomas.

La quimioterapia constituye hoy en día la base del tratamiento de los pacientes con tumores irreseccables, en combinación con radioterapia en los tumores localmente avanzados.

La evaluación económica es una extensión necesaria a la evaluación de cuidados de salud y un instrumento de apoyo a la toma de decisión. Es una técnica complementaria recomendada cuando se decide la asignación de recursos entre diferentes alternativas. Es necesario identificar la más favorable y hasta que cantidad los beneficios adicionales justifican los costos adicionales.

2. OBJETIVOS

La finalidad que se pretende en este estudio consiste en el análisis de los tratamientos aplicados con quimioterapia parenteral a 80 pacientes oncológicos con cáncer de pulmón en el Complejo Hospitalario Universitario de Santiago (CHUS) durante los años 2008 y 2009 con el fin de alcanzar los siguientes objetivos:

- 1º. Conocer cuáles son los esquemas de tratamiento de quimioterapia y en qué líneas son utilizados.
- 2º. Analizar el coste de la quimioterapia oncológica parenteral.
- 3º. Analizar la efectividad en cuanto a supervivencia para cada esquema de tratamiento.
- 4º. Evaluar la terapéutica hospitalaria del cáncer en el periodo estudiado mediante un análisis Coste/Efectividad

3. MATERIAL Y MÉTODOS

Se trata de un estudio prospectivo de los pacientes diagnosticados de Cáncer de Pulmón desde el 31 de diciembre de 2007 en un hospital terciario que ofrece asistencia sanitaria a un área de 392.511 habitantes, constituida por 42 municipios limítrofes. (Complejo Hospitalario Universitario de Santiago, 2003).

El estudio se llevó a cabo analizando los tratamientos parenterales de quimioterapia contra el cáncer de pulmón correspondiente a 80 pacientes tratados durante un periodo desde 2008 y 2009, en el Complejo Hospitalario Universitario de Santiago (CHUS). El CHUS es un Complejo Hospitalario de tercer nivel asistencial compuesto por 3 hospitales, con un aforo de 1.100 camas, encargado de la asistencia hospitalaria pública a una población cercana, en el año 2009, a los 392.511 habitantes para el Área Sanitaria de Santiago y de 450.000 habitantes para la Región Sanitaria Centro, que también atiende a pacientes privados y públicos derivados de otras áreas sanitarias y otros servicios autonómicos de salud, aunque en menor proporción. (Complejo Hospitalario Universitario de Santiago, 2003).

Se creó una base de datos con la aplicación Excel® de veinticuatro campos, en la que se unificaron los datos proporcionados por los programas informáticos utilizados en la Unidad de Medicamentos Citotóxicos del Servicio de Farmacia (Citos® y Oncofarm®) con los de la red central del Hospital (IANUS®) y de la cual posteriormente se eliminaron los campos con el nombre y los apellidos de los pacientes para salvaguardar la protección de su identidad, de acuerdo con la Ley Orgánica 15/1999 de Protección de Datos de Carácter Personal, de modo que la información obtenida, en virtud de la confidencialidad, sólo se expresó

numéricamente en nuestro estudio no pudiéndose asociar a un paciente identificado o identificable.

Para las variables cualitativas las frecuencias absolutas y porcentajes y para determinar la asociación entre sí se empleó la prueba de la χ^2 . Establecimos la normalidad de las variables en función del resultado del test de Kolmogorov-Smirnov. Para valorar la relación entre variables con más de dos categorías y variables cuantitativas que no tenían una distribución normal, utilizamos la prueba de Kruskal-Wallis y el test de Mann-Whitney para variables con dos categorías.

Los costes de los fármacos administrados se obtuvieron del Catálogo de Especialidades Farmacéuticas de 2009. Los costes unitarios de los procedimientos y pruebas incluidas en el estudio se recogieron de los registros del Servicio de farmacia del CHUS. Los costes se recogieron en euros según valores de 2010. En el análisis de costes, fueron incluidos todos los costes asociados con el cuidado directo de la salud, esto es, los limitados a la enfermedad bajo estudio, y los derivados de la práctica clínica de rutina en España.

En la tabla 2 se muestra el listado de los costes correspondientes a:

1. Coste por la administración intravenosa de quimioterapia líneas 1 y 2 durante la inducción y la administración s.c. durante el mantenimiento.
2. Costes asociados con los traslados del paciente.

Idealmente, la perspectiva más apropiada sería la social en la que serían incluidos todos los costes relacionados con la enfermedad (costes directos, indirectos e intangibles). Sin embargo, al igual que en otros artículos, no se incluyeron costes indirectos asociados con el absentismo laboral, pérdida de productividad, ni costes intangibles relacionados con el sufrimiento del paciente. La perspectiva adoptada fue la del Sistema Nacional de Salud Español el cual es el que finalmente asume solamente los costes médicos directos del tratamiento. Por lo tanto, no se han incluido en el análisis otros costes.

Ya que el seguimiento a partir del estudio cubre únicamente un período de 1 año, el curso de la enfermedad y los costes relacionados deben ser derivados de un estudio retrospectivo de los pacientes incluidos en la base de datos. La mayoría del análisis fármaco económicos están de acuerdo en que los costes deberían ser descontados en cualquier estudio que tenga un horizonte temporal superior a 1 año. El descuento se utiliza para convertir costes futuros en valores actuales, permitiendo la generación de datos económicos útiles, teniendo en cuenta costes y beneficios derivados durante varios años. A pesar de que la tasa de descuento adecuada está en controversia y sujeta a cambios a lo largo del tiempo, de acuerdo con el ambiente económico, los costes y beneficios en la salud estaban sujetos, en este estudio, a una tasa de descuento del 6%, el cual es el nivel que ha sido aceptado en España para estos estudios. No obstante, debido a la supervivencia identificada de los sujetos que constituyen la base de datos, inferior a un año, no se ha procedido a aplicar ninguna tasa de descuento en el presente estudio. (OSTEBA, 1999).

Se ha realizado un análisis coste-efectividad mediante la construcción de un modelo de Markov que represente la historia natural del tratamiento del cáncer de pulmón para estudios III y IV con quimioterapia. El modelo reproduce los cambios que implica la quimioterapia en términos de esperanza de vida y compara 2 líneas de

tratamiento farmacológico junto a la alternativa que consiste en dejar que los pacientes sigan su evolución natural sin tratamiento. Se han calculado la efectividad y el coste de las diferentes alternativas y se han comparado mediante la razón coste-efectividad. El árbol de decisión se ha elaborado con el programa Treeplan® de Excel®.

En este análisis, el coste-efectividad incremental se calculó utilizando la siguiente fórmula: $(CQ-CNT)/(EQ-ENT)$, donde C=coste, E=efectividad (supervivencia), Q=tratamiento quimioterápico y NT=no tratamiento.

El ratio Coste/Efectividad empleado en el árbol de decisión ha sido el basado en los costes medios y la efectividad (supervivencia) media.

En el momento presente, sólo se aceptan tres opciones terapéuticas agrupadas en el contexto adyuvante en cáncer de pulmón tanto microcítico como no microcítico, con diferentes costes y efectividad, es decir, LÍNEA 1 ADYUVANTE (Cisplatino o Carboplatino), LÍNEA 2 PALIATIVO (Docetaxel) y no tratamiento. Por esta razón, la metodología descrita anteriormente fue escogida para determinar si el coste incremental (*versus* no tratamiento) de utilizar Línea 1 y Línea 2 para aumentar la supervivencia global de pacientes con cáncer de pulmón, representa una utilización eficiente de los recursos de nuestro Sistema Nacional de Salud. Se ha considerado la supervivencia global como el principal resultado, excluyendo cualquier otro beneficio para la salud, en el análisis farmacoeconómico.

En todas las situaciones en que la toma de decisiones es complicada podremos auxiliarnos de una técnica epidemiológica específica: los árboles de decisión.

Ventajas e inconvenientes de los árboles de decisión Una ventaja de este abordaje sistemático es que no se olvida ningún curso de acción relevante. Además, se explicitan todas sus consecuencias. Ello junto con la valoración objetiva de las probabilidades y de la efectividad, y subjetiva de las utilidades, permite transmitir a los sanitarios e incluso al enfermo, las claves de la toma de decisión. Por último, cuantificamos y no sólo valoramos cualitativamente los pros y los contras de nuestras decisiones. Como beneficio añadido presenta, al igual que el análisis de umbrales de probabilidad, la mejora de la enseñanza de los principios de la decisión clínica. Entre sus inconvenientes destaca que es difícil que los árboles incluyan todos los matices y consecuencias que están presentes en una decisión clínica.

4. RESULTADOS

4.1. DESCRIPCIÓN DE LA POBLACIÓN

Se exponen en la tabla 1 los estadísticos descriptivos de la población objeto de este estudio.

Tabla 1

		EDAD	SUPERVIVENCIA GLOBAL DIAS	COSTE TOTAL	COSTE 1ª LINEA	COSTE 2ª LINEA	Nº DE DIAS DE TRATAMIENTO AMBULATORIO
N	Válidos	80	80	80	80	80	80
	Perdidos	0	0	0	0	0	0
Media		64.33	243.10	4009.4459	352.0137	1511.0111	7.14
Mediana		62.50	239.50	358.8800	.0000	.0000	6.00
Desv. típ.		10.436	188.290	8045.86625	740.77325	4270.09184	8.325
Asimetría		.320	.221	3.081	2.473	3.753	1.407
Curtois		-.613	-1.503	10.646	5.914	13.868	2.606
Mínimo		44	2	.00	.00	.00	0
Máximo		89	586	44670.54	3643.79	21862.74	42

El total de la población está constituida por 80 pacientes, de los cuales el 86% son hombres y el 14% son mujeres. En cuanto a la provincia de origen de las personas con Cáncer de Pulmón la que presento más casos fue A Coruña (82.5%), seguido de la provincia de Pontevedra (15%) y también las provincias de Lugo (1.25%) en Galicia; y León (1.25%) de la Comunidad Autónoma de Castilla y León.

El análisis se realizó a pacientes con Cáncer de Pulmón Microcítico y pacientes con Cáncer de Pulmón No Microcítico.

La edad de los pacientes que se presentaron con esta enfermedad fue mayoritariamente las personas de entre 60 y 70 años representando el 36% es decir poco más de un tercio del total de los pacientes.

Detallando por tipo de Cáncer, en el Microcítico, también se detectó a personas mayoritariamente de edad entre los 60 y 70 años (38%); y en No Microcítico, la edad de las personas que tienen esta enfermedad es también es mayoritariamente las de entre los 60 y 70 años.

Cabe destacar que el total de los pacientes con Cáncer de Pulmón Microcítico y Cáncer de Pulmón No Microcítico, que 66% de la población total se encuentran entre la edad de 50 y 70 años.

La mejor decisión se centra en establecer cuál de las opciones es la más efectiva del tratamiento, entre las opciones es la No Quimioterapia (0 No Qt), Quimioterapia Primera Línea (1 Adyuvante), Quimioterapia Segunda Línea (2 Paliativo).

Dentro de estas opciones de decisión encontramos también que hay pacientes que están dentro de un rango de estado general que va de PS0 hasta PS4 el primero es de muy buen estado del paciente y el ultimo es de muy mal estado del paciente.

La mayor parte de los pacientes casi la mitad son pacientes en buen estado y la mitad de los pacientes se encuentran en buen estado (52%), pero también un gran porcentaje se encuentra en mal o muy mal estado (39%).

Los costes con los cuales se hicieron los análisis y cálculos de coste/efectividad sobre el tratamiento de cáncer de pulmón fueron como se muestran en la tabla 2:

COSTES	MICROCITICO	NO MICROCITICO
TRASLADO	38.53 €	29.40 €
PERSONAL	223.83 €	223.83 €
0 NO QT	- €	- €
1 ADYUVANTE	1,056.54 €	3,214.12 €
2 PALIATIVO	844.37 €	10,508.12 €
CME0	262.36 €	253.23 €
CME1	1,318.90 €	3,467.35 €
CME2	1,106.73 €	10,761.35 €
CMA1-0	1,056.54 €	3,214.12 €
CMA2-1	- 212.17 €	7,294.00 €

Donde:

TRASLADO: Importe del número de ocasiones que tuvo el paciente que trasladarse hasta el Hospital Clínico de Santiago.

PERSONAL: Incluye al Personal Médico y de Enfermería.

0 NO QT: Pacientes que no se les dio Quimioterapia.

1 ADYUVANTE: Pacientes con primera línea del tratamiento.

2 PALIATIVO: Pacientes con segunda línea del tratamiento.

CME0: Coste Medio con No Quimioterapia.

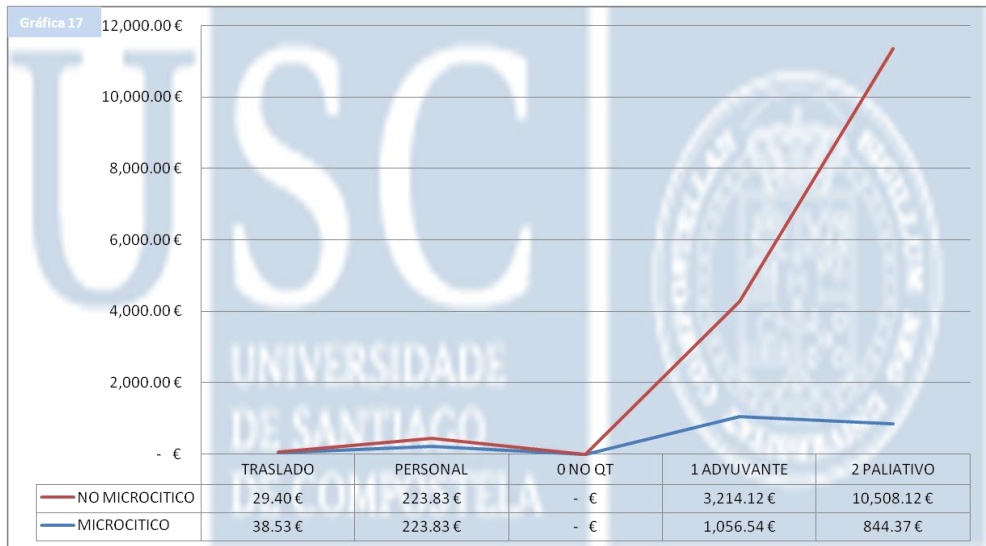
CME1: Coste Medio con Primera Línea (Adyuvante) del Tratamiento.

CME2: Coste Medio con Segunda Línea (Paliativo) del Tratamiento.

CMA1-0: Coste Marginal de CME1 menos CME0.

CMA2-1: Coste Marginal de CM2 menos CME1

Ahora veamos la gráfica 1 para entender con más precisión los objetivos que nos planteamos con el coste/efectividad del tratamiento de cáncer de pulmón para las células microcíticas y no microcíticas.



Se puede apreciar muy claramente cómo se dispara la curva del tratamiento 2 de los no microcíticos, también en se nota una diferencia con la línea de tratamiento 1 del no microcítico con la de microcítico ya que triplica su coste.

La supervivencia media para los pacientes con cáncer de pulmón microcítico es de 9 meses. **Véase en la gráfica 2.**



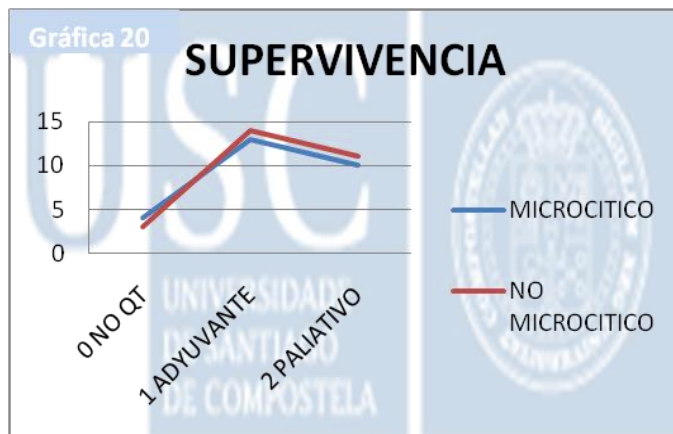
Desglosando la supervivencia por cada opción de decisión nos dice la tabla anterior que si al paciente no se le da quimioterapia la media de supervivencia es de 4 meses, para los pacientes que se les da la primera línea de quimioterapia la media de su supervivencia es de poco más de 1 año, y a los pacientes que se les da una segunda línea de quimioterapia la supervivencia es de 10 meses.

La supervivencia media para los pacientes con cáncer de pulmón no microcítico es de 8 meses. En la **gráfica 3** que se muestra a continuación vemos la supervivencia media de cada opción de decisión.



La supervivencia media de cada opción de decisión es que para a los que se les decide no dar quimioterapia es de 3 meses de media de supervivencia, a los pacientes que se les decide dar la primera línea de tratamiento de quimioterapia la supervivencia es de 14 meses, y para los que se les decide dar segunda línea de tratamiento de quimioterapia es de poco más de 1 año de supervivencia.

Para diferenciar la supervivencia de cada uno de estos tipos de cáncer de pulmón vemos la siguiente gráfica 4 donde se muestra casi una similitud de la línea de supervivencia en las diferentes opciones de decidir sobre que hacer al paciente.

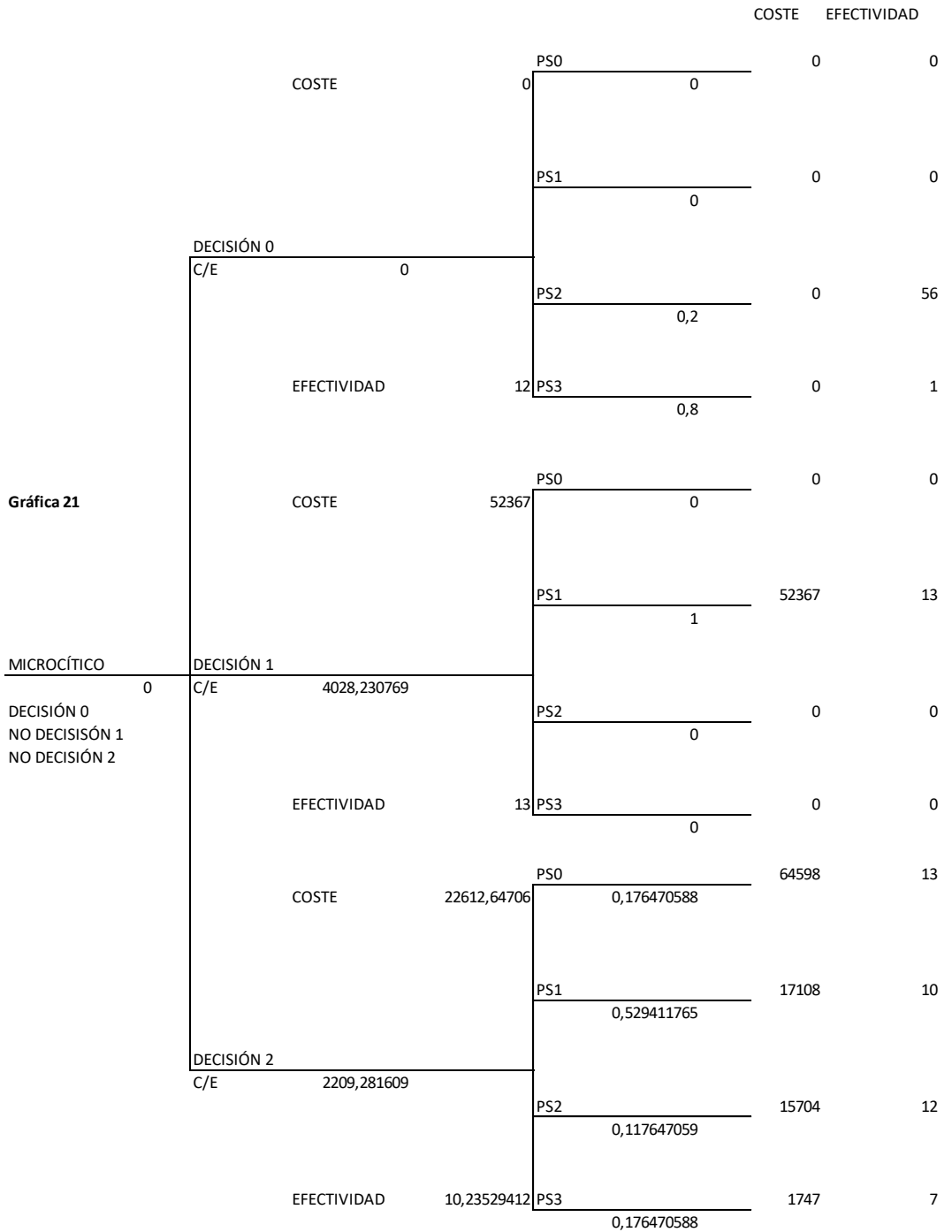


Cabe mencionar que cuando a un paciente se le decide no dar tratamiento de quimioterapia es porque lo que nos muestra en la gráfica tiene realmente poco tiempo de vida, a los pacientes que se les decide dar la primera línea de

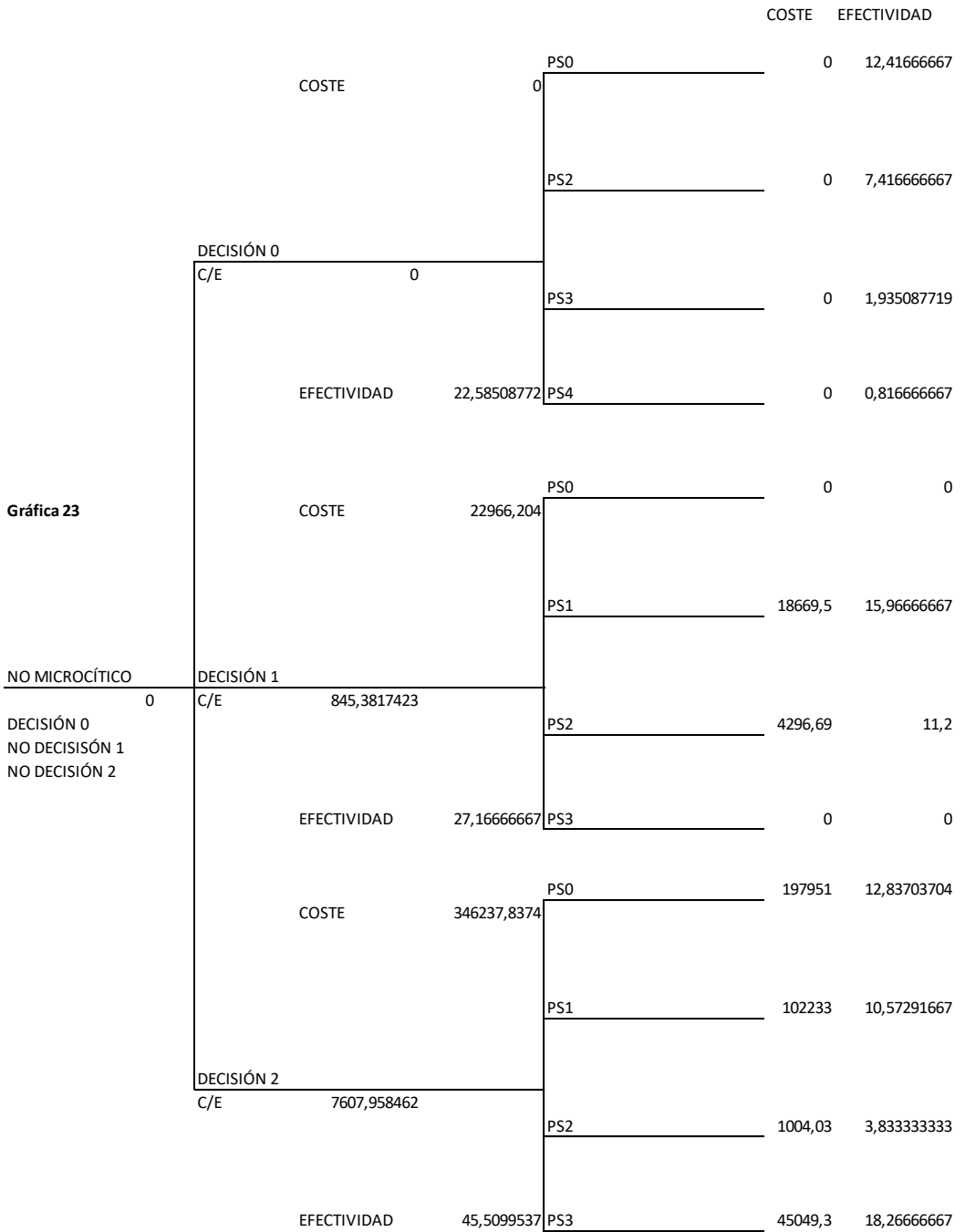
quimioterapia es para aumentar la supervivencia y mejorar la calidad de vida, y a los pacientes que se encuentran para la segunda línea del tratamiento de quimioterapia es solo para mejorar la calidad de vida en el tiempo que les podría quedar.

4.2. ÁRBOLES DE DECISIÓN

En la siguiente parte veremos los resultados que nos arrojaron los análisis correspondientes a los pacientes de Cáncer de Pulmón Microcítico y Cáncer de Pulmón No Microcítico. El algoritmo de decisión empleado ha sido la minimización del ratio Coste/Efectividad.



En este segundo árbol de Coste/Efectividad del Tratamiento de Cáncer de Pulmón No Microcítico nos da como resultado que es mejor no dar tratamiento de quimioterapia ya que esta decisión ofrece el menor ratio Coste/Efectividad.



5. DISCUSIÓN

Después de haber llegado finalmente a los resultados del análisis coste/efectividad del tratamiento de cáncer de pulmón, concluyo que este trabajo realizado coincide con algunas otras tesis y otros escritos especializados en el tema. Coincide en que el cáncer de pulmón no microcítico es más del 70% de los casos de esta enfermedad. La supervivencia para los pacientes de cáncer de pulmón microcítico es menor de 2 años y para los pacientes de cáncer de pulmón no microcítico coincidimos prácticamente que es no mayor a 1 año. (Fernando Piedra Sánchez, 2004).

Otro artículo hecho para el área sanitaria de A Coruña relacionado con el tema coincide con los datos que hablan sobre el género de los pacientes al tener mayoritariamente a varones dentro de esta enfermedad. La supervivencia para este estudio de la A Coruña es similar a los resultados que nos arrojan el análisis de datos del tratamiento de cáncer de pulmón. La supervivencia en los pacientes microcítico fue de 6,5 +- 0,5 meses algo similar al análisis realizado y a la tesis doctoral mencionada con anterioridad; en los pacientes de cáncer de pulmón no microcítico los resultados son 7,8 +- 1,2 que también coinciden con los análisis hechos y estudiados. La edad media (64,33 años) es similar y observada en otros estudios españoles e inferior a los 71 años que encuentran Browns et al en el Reino Unido. En nuestra población de pacientes valoramos la supervivencia y encontramos que la mediana es de 7,98 meses similar a otros análisis realizados. (C. Montero, et al, 2002).

Vale la pena señalar que nuestro análisis coincide con el artículo “Cost-effectiveness of paclitaxel plus cisplatin in advanced non-small-cellung cáncer” editado en Ontario Canadá para el Ottawa Regional Cancer Centre, y coincide precisamente en considerar como coste de personal a los médicos y enfermeras para su análisis del cáncer de pulmón. También para este análisis realizado en Canadá, ellos calcularon sus datos mediante la misma fórmula realizada por este análisis. (CC Earle y WK Evans, 1998).

Dentro de los análisis de costes que se han realizado en esta década en Irlanda del Norte, nuestros costes también son similares en su totalidad con los pacientes tratados. Utilizando la misma metodología para el desarrollo del análisis obtuvieron resultados similares no solo en los costes sino en los porcentajes de pacientes que presentaban el cáncer de pulmón microcítico y no microcítico, la supervivencia es similar a nuestros resultados en base a la metodología que se utilizó. (Ian Fleming, Pauline Monaghan, et al, 2007).

También en Francia se han hecho estudios sobre el cáncer de pulmón y concretamente en los análisis económicos en lo que podemos rescatar que coincidimos con nuestro estudio en las variables empleadas para el análisis, y los factores que influyen en los costes ya sean directos o indirectos. Todo ello para desarrollar la estrategia médica para la toma de decisiones, basados en los resultados de años de vida ganados, reducción en número de pacientes tratados, ratios de responsabilidad. (A. Vergnengre, et al, 2001).

Los métodos utilizados y resultados obtenidos en el estudio “Cost-effectiveness analysis of oral chemotherapy in ambulatory care: the example of vinorelbine” en París, son similares a los que este y otros análisis que se han hecho sobre el tratamiento de cáncer de pulmón. (K. Le Lay, et al, 2001).

Solo en un estudio realizado en la Universidad Médica, del Reino Unido hubo una supervivencia de 4 años mayor a la media de 14 pacientes (6% del análisis), siendo solo la única diferencia encontrada con el análisis realizado y los otros estudios que se han hecho en diferentes partes del mundo. (JL Wolstenholme y DK Whynes, 1998).

En relación con los árboles de decisión, el análisis coste-efectividad y el coste-utilidad otro estudio (Zárate, 2010) establece lo siguiente:

En los análisis de costo-efectividad (ACE) los beneficios de las estrategias a evaluar no son equivalentes y son medidos en unidades naturales de morbilidad, mortalidad o calidad de vida. Dentro de las unidades más frecuentemente utilizadas están las muertes evitadas, los años de vida ganados, cambios en unidades de presión arterial o colesterol, cambios en escalas de dolor o cambios en escalas de calidad de vida relacionada con la salud (Goodacre et al, 2002) (Palmer et al, 1999).

Los ACE tienen la limitante de ser unidimensionales, es decir, evalúan sólo una dimensión de los beneficios. Esto no sólo dificulta el proceso de elección del outcome a evaluar, ya que se debe tratar de elegir al más representativo de la intervención, sino que además limita las posibilidades de comparación entre distintas intervenciones.

Revesz et al (2017) realizaron una búsqueda sistemática de literatura que arrojó 3531 artículos. En total, 67 artículos fueron incluidos después de referencia adicional. rastreo. Los 39 Sistemas de Soporte para la Decisión (SSD) identificados tienen como objetivo predecir la supervivencia general y / o la supervivencia libre de progresión, pero no dan Información sobre toxicidad o rentabilidad. Se incorporaron varios predictores, tales como el estado de rendimiento, Marcadores séricos e inflamatorios, y características del paciente y tumor. Pocos SSD se habían validado externamente utilizando datos clínicos recientes, y la discriminación y la calibración a menudo eran deficientes. Como conclusiones, los autores establecen que se han desarrollado muchos SSD para pacientes con cáncer de pulmón No Microcíticos incurables, pero todavía faltan SSD que estén actualizados con un buen rendimiento del modelo, al tiempo que cubre todo el espectro de tratamiento.

Parada Vargas y Barbosa (2013) evaluaron el costo-efectividad de Erlotinib como tratamiento en primera línea (1L) de pacientes con cáncer pulmonar de células no pequeñas, CPCNP estadio IIIB/IV, con mutación del gen EGFR+, en comparación con la quimioterapia estándar (carboplatino/ Paclitaxel) y con Gefitinib, desde la perspectiva del Sistema de Salud Colombiano. Se empleó un Modelo de Markov que simula el curso del CPCNP, con ciclos mensuales. Los estados de salud considerandos en el modelo son: Libre de progresión de enfermedad (LPE), Libre de progresión de enfermedad con respuesta (LPER), Progresión de enfermedad (PE); y Muerte. Se consideran costos directos y eventos adversos en pesos colombianos, años de vida ganados libres de enfermedad (AVGLE), para Erlotinib y Gefitinib comparados con quimioterapia estándar. Las probabilidades de transición se tomaron de la literatura, los costos se obtuvieron a partir de consenso de expertos según la práctica habitual, los costos de los medicamentos se tomaron de las bases oficiales (SISMED y Circular 04 de 2012). Se empleó una tasa de descuento de 3% para costos y beneficios. El costo total para los 60 ciclos de la terapia con Erlotinib fue de \$153 millones por 1.55 AVGLE; frente a la quimioterapia estándar con \$122 millones por 1.28 AVGLE; y para la terapia con Gefitinib de \$158 millones para 1.43 AVGLE. La razón de costo efectividad incremental de Erlotinib empleado en 1L es

de \$112 millones por 0,27 AVGLE, con respecto al esquema estándar de quimioterapia. La razón de costo efectividad incremental de Gefitinib es de \$245 millones para alcanzar 0.14 AVGLE. Concluyen que el Erlotinib mantiene el costo por beneficio ganado de la terapia estándar que ya esta siendo reembolsada por el Sistema de Salud Colombiano; en ese sentido, se puede considerar una terapia eficiente.

Atendiendo al estudio de De Cos Escuín (2017), investigaciones recientes sobre la relación entre el sistema inmune y el cáncer han desvelado los mecanismos moleculares mediante los cuales las células neoplásicas aprovechan algunos receptores de los linfocitos T, con función inhibitoria de la respuesta citotóxica, para defenderse del ataque inmune desarrollado frente a ellas. Estos hallazgos han permitido identificar dianas precisas (receptores de los linfocitos T o ligandos que se acoplan a ellos) frente a los que se han diseñado anticuerpos monoclonales, capaces de desbloquear la respuesta inmunitaria.

Estos fármacos (*immune check point inhibitors*), de eficacia demostrada en el melanoma metastásico o el carcinoma renal, han sido probados con éxito frente al carcinoma de pulmón no microcítico en ensayos recientes. Tras su aprobación e incorporación a la práctica clínica en 2.^a línea después de una pauta inicial de quimioterapia (QT), se han comunicado en el último año resultados positivos en ensayos aleatorizados que los comparaban con QT estándar en 1.^a línea. Se han observado respuestas sorprendentes y duraderas, aunque no superan el 20-25% en pacientes no seleccionados, por lo que es crucial detectar rasgos predictivos de eficacia, como el biomarcador PD-L1, si bien los diferentes métodos para su detección han producido resultados dispares.

En esa revisión no sistemática se discuten los resultados de los últimos ensayos, las posibilidades de incorporar estos fármacos en primera línea, los criterios de selección de pacientes, los efectos adversos y las perspectivas de su empleo asociados a modalidades terapéuticas tradicionales como QT, radioterapia o antiangiogénicos.

6. CONCLUSIONES

1. El coste medio de la quimioterapia oncológica parental adyuvante es de 1.318,9 € para los tumores de pulmón microcíticos, y de 3.467,35 € para los no microcíticos.

El coste medio de la quimioterapia oncológica paliativa para los tumores de pulmón microcíticos es de 1.106.73 €, y los tumores de pulmón no microcíticos es de 10.761,35 €.

Para los tumores de pulmón no microcíticos la decisión 2. La efectividad medida como supervivencia media del tratamiento quimioterapico oncológico parental adyuvante en el cáncer de pulmón microcítico es de 13 meses. Y en el no microcítico es de 14 meses.

La supervivencia del tratamiento oncológico parental paliativo es de 10 meses para los tumores de pulmón microcíticos y de 11 meses para los tumores no microcíticos.

La supervivencia de los enfermos con cáncer de pulmón sin tratamiento oncológico parental es de 4 meses para los microcíticos y de 3 meses para los no microcíticos.

3. En el caso de los tumores de pulmón microcíticos la decisión terapéutica que presenta una mejor ratio de coste/efectividad, por lo tanto más eficiente, es el

tratamiento quimioterápico oncológico parental adyuvante, terapéutica que presenta un ratio coste/efectividad mejor es no aplicar ningún tratamiento oncológico parental.

REFERENCIAS

DRUMMOND M, O'BRIEN B, STODDARD G, TORRANCE G. *Methods for the economic evaluation of health care programmes* (2.a ed.), Oxford: 4 Oxford University Press, 1997; cap. 6. Ed. Donalson MS, Sox HC. Washington DC, National Academy Press.

EARLE CC, STEWART DJ, CORMIER Y, EVANS WK, GERTLER SZ, MIHALCIOIU C, WALDE PD (1998) A phase I study of gemcitabine/cisplatin/etoposide in the treatment of small-cell lung cancer, *Lung Cancer*. Dec;22(3):235-41.

GOODACRE S, MCCABE C. (2002) An introduction to economic evaluation, *Emerg Med J*; 198-201.

IAN FLEMING, PAULINE MONAGHAN, ANNA GAVIN AND CIARAN O'NEILL (2008) Factors Influencing Hospital Costs of Lung Cancer Patients in Northern Ireland, *The European Journal of Health Economics*, Vol. 9, No. 1 (Feb.), pp. 79-86

LE LAY, K., RIOU-FRANÇA, L., LAUNOIS, R., (2002) Cost-effectiveness analysis of oral chemotherapy in ambulatory care: the example of vinorelbine, *Journal d'Economie Médicale*, Vol. 20, No. 7-8, 379-400

MONTERO, C., ROSALES, M., OTERO, I., BLANCO, M., RODRÍGUEZ, G., PETERGA, S., PITA, S., VERA, H. (2003) Lung cancer in the health care area of A Coruña (Spain): incidence, clinical approach and survival, *Arch Bronconeumol*;39(5):209-16

PALMER S, BOYFORD S, (1999) Economics notes: types of economic evaluation. *BMJ*; 318 (7194): 1349.

PARADA VARGAS, L.A., BARBOSA, D.A., (2013) Análisis De Costo-Efectividad De Erlotinib en El Tratamiento De Pacientes Con Cáncer Pulmonar De Células No Pequeñas, CPCNP, Con Mutación Del Gen EGFR+, en Colombia *Value in Health*, November Volume 16, Issue 7

PIEDRA SÁNCHEZ, F. (2004) Evolución en la terapéutica hospitalaria del Cáncer, Tesis Doctoral, Universidad Complutense de Madrid, ISBN 84-669-2517-1.

RÉVÉSZ, D., ENGELHARDT, E.G., TAMMINGA, J.J., SCHRAMMEL, F.M.N.H., ONWUTEAKA-PHILIPSEN, B.D., VAN DE GARDE, E.M.W., STEYERBERG, E.W., JANSMA, E.P., DE VET, H.C.W., COUPÉ, V.M.H., (2017) Decision support systems for incurable non-small cell lung cancer: a systematic review, *BMC Medical Informatics and Decision Making* 17:144

SÁNCHEZ DE COS ESCUÍN, J., (2017) Nueva inmunoterapia y cáncer de pulmón, *Arch Bronconeumol.*; 53(12) :682-687

Sociedad Americana del Cáncer, *Cáncer del Pulmón, Guías de tratamiento para los pacientes*, 2001.

VERGNEGRO, A., MOLINIER, L., COMBESCURE, C., DAURES, J.P., SCHULLER-LEBEAU, M.P., CHOUAID, C. (2001) Economic evaluation of the clinical management of lung cancer in France, *European Journal of Cancer*, April, Vol. 37, Supplement 6

WOLSTENHOLME, J.L., Whyne, D.K., (1999) The hospital costs of treating lung cancer in the United Kingdom, *Br J Cancer*. Apr; 80(1-2): 215-218

ZARATE, V. (2010) Evaluaciones económicas en salud: conceptos básicos y clasificación, *Rev. méd. Chile* v.138 supl.2 Santiago sep.



ANÁLISIS BIOECONÓMICO DE PREDADOR-PRESA: LA PESQUERÍA MIXTA COMUNITARIA DE MERLUZA Y BACALADILLA

MARCOS ÍÑIGO PÉREZ PÉREZ

Departamento Economía Aplicada/Universidad de Vigo
Estrada San Cosme, 2, 36310 Vigo, Pontevedra/marcos.perez@uvigo.es

RAQUEL FERNÁNDEZ GONZÁLEZ

Departamento Economía Aplicada/Universidad de Vigo
Estrada San Cosme, 2, 36310 Vigo, Pontevedra/raquelf@uvigo.es

MARÍA DOLORES GARZA GIL

Departamento Economía Aplicada/Universidad de Vigo
Estrada San Cosme, 2, 36310 Vigo, Pontevedra/dgarza@uvigo.es

e-mail Marcos Íñigo Pérez Pérez: marcos.perez@uvigo.es

Resumen

Este trabajo desarrolla un modelo bioeconómico de tipo depredador-presa aplicado a la pesquería mixta de merluza europea (*Merluccius merluccius*) y bacaladilla (*Micromesistius poutassou*) en los caladeros de la Unión Europea. En este modelo, la merluza representa el depredador y la bacaladilla representa la presa. La bacaladilla es la principal presa de la merluza en el área de estudio, y representa alrededor del 40% de la dieta de merluza. Las dinámicas poblacionales del depredador y de la presa siguen la formulación de Lotka -Volterra y se supone una interacción lineal entre las poblaciones de depredadores y presas, con dos coeficientes de interacción: α es el efecto de un cambio unitario en la presa sobre la tasa de crecimiento porcentual del depredador, y β es la tasa de ataque o eficiencia de búsqueda del depredador. Las poblaciones interactúan aleatoriamente en proporción a la densidad de población. El objetivo es maximizar el valor presente de los beneficios de la pesquería mixta, utilizando el principio del máximo de la teoría del control óptimo. Se construyó en primer lugar el modelo teórico, a continuación se realizó un análisis econométrico de los datos de biomásas y capturas, y por último, una vez conocida la forma cuadrática de las funciones de crecimiento, se resolvió el modelo aplicado, obteniendo los valores de biomásas óptimas, capturas óptimas, biomásas de MRS, precios sombra y beneficios de la pesquería de merluza y bacaladilla. El análisis de sensibilidad de los resultados revela que el máximo beneficio económico se alcanza ejerciendo una baja presión relativa sobre los recursos, utilizando tasas de descuento próximas a cero.

Palabras clave: Pesquería mixta, modelo multiespecífico, modelo predador-presa, bacaladilla, merluza.

Área Temática: Economía Azul. Del Mar y Actividades Marítimas

Abstract

This work develops a bioeconomic model of predator-prey type applied to the mixed fishery of European hake (*Merluccius merluccius*) and blue whiting (*Micromesistius poutassou*) in the fishing grounds of the European Union. In this model, the hake represents the predator and the blue whiting represents the prey. Blue whiting is the main hake prey in the study area, and represents around 40% of the hake diet. The dynamic predator and prey populations follow the Lotka-Volterra formulation and a linear interaction between predator and prey populations is assumed, with two interaction coefficients: α is the effect of a unit change in the prey on the rate Percentage growth of the predator, and β is the attack rate or search efficiency of the predator. Populations interact randomly in proportion to population density. The objective is to maximize the present value of the benefits of the mixed fishery, using the maximum principle of optimal control theory. The theoretical model was first constructed, then an econometric analysis of the biomass and capture data was carried out, and finally, once the quadratic form of the growth functions was known, the applied model was solved, obtaining the values of optimal biomass, optimal catches, MRS biomasses, shadow prices and benefits of the hake and blue whiting fishery. The sensitivity analysis of the results reveals that the maximum economic benefit is achieved by exerting a relative low pressure on resources, using discount rates close to zero.

Key Words: Mixed fishery, multispecific model, predator-prey model, blue whiting, hake.

Thematic Area: Blue Sea Economy and Maritime Activities

1. INTRODUCCIÓN

Los modelos bioeconómicos multiespecíficos se desarrollan en el marco de la gestión de pesquerías mixtas que intenta evaluar y predecir la dinámica poblacional y el rendimiento económico de las especies pesqueras explotadas, superando el planteamiento monoespecífico adoptado históricamente por la gestión pesquera. En particular, los modelos predador-presa tienen en cuenta las relaciones tróficas entre dos o más especies ecológicamente interdependientes, y pertenecientes a un mismo ecosistema. El presente trabajo consiste en la aplicación de un modelo predador-presa con captura de dos especies comerciales capturadas por la flota de pesca europea que opera en los caladeros comunitarios. A la hora de seleccionar las especies con las que desarrollar el modelo, se tuvieron en cuenta criterios de tipo económico (dos especies de importancia comercial), geográfico (especies capturadas en los caladeros comunitarios por la flota pesquera europea) y biológico (especies con una interacción trófica significativa). En base a estudios previos, se seleccionó como especie predatora la merluza europea, *Merluccius merluccius*, como especie presa la bacaladilla, *Micromesistius poutassou*, y como ámbito geográfico las aguas de la Unión Europea. Se utilizarán los datos de biomasa y capturas correspondientes al periodo 1988-2014.

La merluza europea es un importante recurso de alto valor comercial, y especie objetivo de numerosas pesquerías. Diferentes estudios sobre la dieta de la merluza en áreas europeas la caracterizan como un gran predador piscívoro de numerosas especies comerciales, como el lirio, el jurel, la caballa, la sardina y la anchoa. La posición ecológica de la merluza europea, en la cima de la cadena trófica, probablemente juega un papel importante en su ecosistema, y por tanto en la dinámica de otras especies económicamente importantes, lo cual unido a su importancia pesquera, hace particularmente necesario su estudio desde una perspectiva multiespecífica.

2. PESQUERÍAS DE MERLUZA Y BACALADILLA

En las aguas europeas, la merluza *Merluccius merluccius* (Linnaeus, 1758) y la bacaladilla *Micromesistius poutassou* (Risso, 1827), son especies comerciales comunes. Se distribuyen principalmente a lo largo de la plataforma continental, dónde tiene lugar el desove durante los meses invernales. Se trata de especies con una relación depredador-presa clara, constituyendo la bacaladilla la principal presa de la merluza.

La merluza europea está ampliamente distribuida a lo largo del Atlántico nordeste. Es una especie demersal y bentopelágica, con un rango de profundidades que varía de los 30 hasta los 1.000 metros aunque habita generalmente a profundidades de 70 a 370 metros. Forma cardúmenes que viven próximos a la costa en verano y más alejados en invierno. La reproducción tiene lugar entre los 100 y 300 metros de profundidad. La época de puesta se extiende desde enero a mayo en el Golfo de Vizcaya y de mayo a julio en el Mar Céltico. Los juveniles viven en fondos fangosos hasta la edad de 3 años, acercándose después a la costa. Los individuos adultos grandes suelen encontrarse en el talud continental, donde el fondo es abrupto y asociado a cañones y precipicios. La merluza europea es un predador en la cima de la pirámide trófica de la comunidad demersal del Atlántico Noreste, que se alimenta de otras especies de peces como la anchoa (*Engraulis encrasicolus*), la sardina (*Sardina pilchardus*), la bacaladilla (*Micromesistius poutassou*), el jurel (*Trachurus trachurus*) y la caballa (*Scomber scombrus*).

La merluza es capturada en pesquerías mixtas junto con el gallo, el rape y la cigala por una flota multiaparejo, mediante las siguientes modalidades de pesca: arrastre de fondo con puertas, arrastre de fondo en pareja, palangre de fondo, volantas y artes menores. Se ha producido un aumento importante en las capturas al norte del área de distribución (división IIIa, y subzonas IV y VI) en los últimos años. La captura total europea en 2014 fue de 103.400 toneladas, de las que 91.525 provenían del stock Norte y 11.875 del stock Sur. Los desembarques totales siguen una tendencia creciente desde 1998. El promedio anual en el periodo 1988-2014 fue de 66.962 toneladas. Los descartes de juveniles de merluza han aumentado considerablemente en los últimos años.

La bacaladilla se distribuye a lo largo del Atlántico Norte desde el sur del Mar de Barents y el Mar de Noruega oriental hasta el Cabo Bojador, en la costa africana. Es una especie demersal de la familia de los gádidos. El hábitat es oceánico y bentopelágico, a lo largo de la plataforma y el talud continental, con una distribución vertical de entre 150 y más de 1000 metros de profundidad, aunque es más común a 300-400 metros. Migra en verano, después de desovar, hacia el Norte (Islas Feroe, este de Islandia y Noruega) y vuelve a las áreas de desove entre enero y febrero. Alcanza su primera madurez a los 3 años de edad. La puesta es pelágica y ocurre entre febrero y junio, y la principal área de desove es el oeste de las Islas Británicas. El crecimiento es rápido, y las hembras son normalmente más grandes que los machos. La edad máxima es 20 años (45 centímetros). La dieta de la bacaladilla presenta una clara estacionalidad y está compuesta principalmente de crustáceos, siendo sus principales presas los copépodos, los eufásidos, las larvas de decápodos y el decápodo *Pasiphaea sivado*.

La pesquería de bacaladilla es llevada a cabo principalmente por parejas de arrastre de fondo que la tienen como especie objetivo y por arrastreros de fondo individuales que la capturan de forma accesoria. La bacaladilla es una especie tradicionalmente pescada en gran cantidad y de importancia comercial, si bien el precio que alcanza en el mercado es bajo. Esta especie juega un papel relevante en los intercambios de cuotas con otros Estados para obtener especies de mayor valor, como los realizados con Noruega a cambio de mayor cuota de bacalao. Debido a ello, solo se captura parte de la cuota anual inicialmente asignada, siendo a veces los desembarcos finales notablemente inferiores a esta.

La interdependencia ecológica de las poblaciones de merluza y bacaladilla en aguas europeas ha sido puesta de manifiesto por diferentes autores. Velasco y Olaso (1998) estudian la alimentación de la merluza europea en el Mar Cantábrico (División VIIIc), analizando sus variaciones estacionales, batimétricas y en función de la talla en base a los contenidos estomacales de 5.828 ejemplares muestreados. Destacan la importancia de la bacaladilla como presa principal de la merluza a profundidades mayores de 100 m, mientras que el jurel y los clupeidos juegan un papel dominante en los estratos más superficiales (< 100 m), porque a esas profundidades, la abundancia de bacaladilla es muy baja en el Cantábrico (Sánchez, 1993; Velasco y Olaso, 1998). La bacaladilla se convierte en la base fundamental de la dieta de la merluza a partir de los 40 centímetros de talla, desapareciendo prácticamente el consumo de jurel y otras especies. El análisis de regresión de la relación de tallas predador-presa confirma la existencia de una relación significativa entre la talla de la merluza y la talla de la bacaladilla, ya indicada por Gonzalez et al. (1985) y Guichet (1995). Sin embargo, el predador alcanza un tamaño en el que, aunque continúa creciendo, no puede encontrar presas más grandes, puesto que no existen en la población. Este límite se alcanza aproximadamente en merluzas que miden 40 centímetros, que capturan bacaladillas de 33 centímetros. Los autores observan que, en el Cantábrico, la merluza tiene una dependencia de la bacaladilla mucho mayor que en el norte del Golfo de Vizcaya. Mahe *et al.* (2007), confirmó estos resultados, al demostrar que la bacaladilla era la especie presa más importante de la merluza en el Mar Cantábrico, siendo sin embargo presa de importancia moderada en el norte del Golfo de Vizcaya y el Mar Céltico (Mahe *et al.*, 2007). Cabral y Murta (2002) estudiaron la dieta de la bacaladilla, la merluza, el jurel y la caballa en aguas portuguesas (División IXa), analizando los contenidos estomacales de ejemplares de dichas especies muestreados a lo largo de la costa portuguesa, a profundidades de 20 m a 750 m. Los resultados obtenidos para la merluza demuestran que la bacaladilla es su presa más importante en porcentaje, ocurrencia y peso, seguido por los crustáceos (*Processa* spp. y misidáceos).

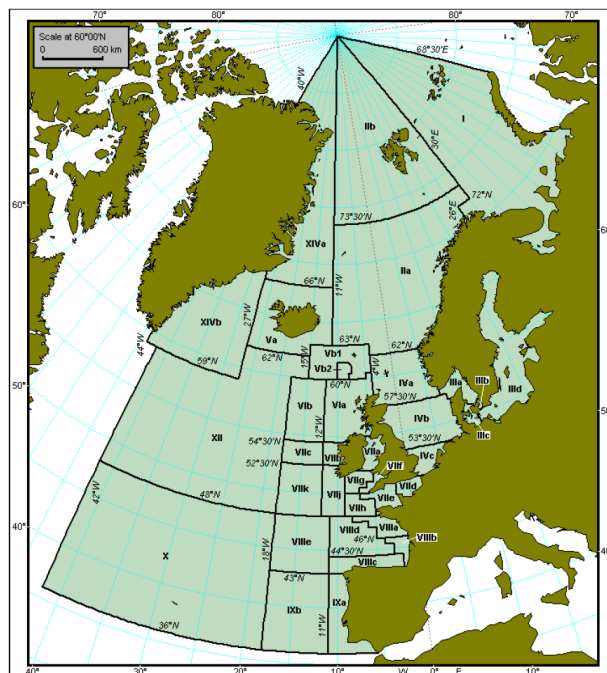


Figura 1. Zonas estadísticas del ICES.

	Biomasa de merluza X_t	Biomasa de bacaladilla Y_t	Captura de merluza $h_{t,m}$	Captura de bacaladilla $h_{t,L}$
1988	118.588	1.615.000	81.476	558.000
1989	109.002	1.550.000	80.259	627.000
1990	96.661	1.334.000	73.144	562.000
1991	92.221	1.732.000	70.956	370.000
1992	89.329	2.546.000	70.415	475.000
1993	76.533	2.637.000	63.628	481.000
1994	66.594	2.523.000	61.124	459.000
1995	71.535	2.294.000	69.860	579.000
1996	66.257	2.180.000	56.925	646.000
1997	56.283	2.471.000	50.963	672.000
1998	53.453	3.757.000	42.743	1.125.000
1999	60.443	4.611.000	46.984	1.256.000
2000	68.171	4.291.000	49.928	1.412.000
2001	66.339	4.648.000	44.255	1.780.000
2002	70.492	5.184.000	46.797	1.556.000
2003	76.179	6.934.000	49.906	2.321.000
2004	77.313	6.689.000	53.359	2.378.000
2005	73.287	5.850.000	54.883	2.027.000
2006	74.754	5.885.000	52.283	1.966.000
2007	83.886	4.672.000	59.960	1.612.000
2008	101.518	3.489.000	64.534	1.246.000
2009	147.964	2.610.000	78.058	636.000
2010	209.575	2.538.000	88.167	540.000
2011	244.663	2.572.000	104.602	105.000
2012	230.370	3.396.000	100.250	384.000
2013	221.233	3.918.000	89.106	626.000
2014	222.132	3.965.000	103.400	1.146.000

Fuente: ICES

3. APLICACIÓN DEL MODELO MULTIESPECÍFICO A LA PESQUERÍA DE MERLUZA Y BACALADILLA

3.1. CONSTRUCCIÓN DEL MODELO TEÓRICO

El modelo utilizado se basa en el modelo matemático predador – presa de Lotka-Volterra (Volterra, 1926; Lotka, 1932). Se parte de las ecuaciones logísticas predador – presa utilizadas por Brown *et al.* (2005), para las poblaciones de perca del Nilo (predador), y dagaa (presa) en el lago Victoria (África centro-oriental):

$$\frac{dX}{dt} = r_m X \left[1 - \frac{X}{\bar{X}} \right] - h_m + \alpha XY \quad (3.1)$$

$$\frac{dY}{dt} = r_L Y \left[1 - \frac{Y}{\bar{Y}} \right] - h_L - \beta YX \quad (3.2)$$

siendo X la biomasa de merluza, Y la biomasa de bacaladilla; r_m y r_L las tasas intrínsecas de crecimiento poblacional de la merluza y la bacaladilla respectivamente; \bar{X} e \bar{Y} las capacidades de carga del medio para ambas especies; h_m y h_L las respectivas capturas, y α y β los coeficientes de interacción de las especies. La función de beneficios netos de la pesquería en el momento t, se define como:

$$\pi(X, Y, h_m, h_L) = (P_m - C_m(X))h_m(t) + (P_L - C_L(Y))h_L(t) \quad (3.3)$$

Siendo P_m y P_L los precios de la merluza y la bacaladilla, y C_m y C_L los costes de captura respectivos. La función objetivo seleccionada para el problema de control será:

$$J = \int_0^{\infty} e^{-\rho t} \pi[X(t), Y(t), h_m(t), h_L(t)] dt \quad (3.4)$$

Los controles factibles óptimos, $h_m(t) = h_m^*$, $h_L(t) = h_L^*$, serán aquellos que maximicen la función objetivo, a la vez que satisfacen las condiciones del problema:

$$\max \int_0^{\infty} e^{-\rho t} [(P_m - C_m(X))h_m(t) + (P_L - C_L(Y))h_L(t)] dt \quad (3.5)$$

$$\text{s.a.} \quad \frac{dX}{dt} = f(X) - h_m$$

$$\frac{dY}{dt} = g(Y) - h_L$$

$$0 \leq h_m(t) \leq h_m \max$$

$$0 \leq h_L(t) \leq h_L \max$$

$$0 < X(t)$$

$$0 < Y(t)$$

La función hamiltoniana adopta la forma:

$$\begin{aligned} H[X(t), Y(t), h_m(t), h_L(t), t; \lambda_1(t), \lambda_2(t)] &= \\ &= e^{-\rho t} [(P_m - C_m(X))h_m(t) + (P_L - C_L(Y))h_L(t)] + \\ &+ \lambda_1(t)[F(X) - h_m(t) + \alpha XY] + \lambda_2(t)[G(Y) - h_L(t) - \beta YX] \end{aligned} \quad (3.6)$$

donde λ_1 y λ_2 son los precios sombra respectivos de la merluza y la bacaladilla, $f(X)$ representa el crecimiento neto del stock de merluza y $g(Y)$, el crecimiento neto del stock de bacaladilla.

Las condiciones de primer orden para este problema se expresan en las siguientes ecuaciones:

$$\frac{\partial H}{\partial h_m} = 0 \quad (3.7)$$

$$\frac{\partial H}{\partial h_L} = 0 \quad (3.8)$$

$$\frac{\partial \lambda_1}{\partial t} = \dot{\lambda}_1 = -\frac{\partial H}{\partial X} \quad (3.9)$$

$$\frac{\partial \lambda_2}{\partial t} = \dot{\lambda}_2 = -\frac{\partial H}{\partial Y} \quad (3.10)$$

$$\frac{\partial X}{\partial t} = \dot{X} = \frac{\partial H}{\partial \lambda_1} \quad (3.11)$$

$$\frac{\partial Y}{\partial t} = \dot{Y} = \frac{\partial H}{\partial \lambda_2} \quad (3.12)$$

Las *ecuaciones adjuntas*, a satisfacer por λ_1 y λ_2 , se obtienen a partir de las condiciones de primer orden expresadas en las ecuaciones (3.9) y (3.10):

$$\dot{\lambda}_1 - \rho\lambda_1 = -\lambda_1(t)[F'(X) + \alpha Y] + \lambda_2(t)\beta Y \quad (3.13)$$

$$\dot{\lambda}_2 - \rho\lambda_2 = -\lambda_2(t)[G'(Y) - \beta X] - \lambda_1(t)\alpha X \quad (3.14)$$

Si el hamiltoniano es lineal en relación a las variables de control, $h_m(t)$ y $h_L(t)$, también lo será el problema del control óptimo, siendo entonces las condiciones de Pontryagin necesarias y suficientes para la existencia de un óptimo (Rozonoer, 1959). Al cumplirse esa condición en este caso, es posible resolver el problema con la ayuda de unas funciones auxiliares, las *funciones de conmutación*, $\sigma_1(t)$ y $\sigma_2(t)$, que se igualan a la derivada del hamiltoniano respecto a las variables de control. Los niveles óptimos de captura, h_m^* y h_L^* , deben maximizar H en cada instante de tiempo. Expresando H como:

$$\begin{aligned} H[X(t), Y(t), h_m(t), h_L(t), t; \lambda_1(t), \lambda_2(t)] = \\ = (e^{-\rho t}(P_m - C_m(X)) - \lambda_1(t))h_m(t) + (e^{-\rho t}(P_L - C_L(Y)) - \lambda_2(t))h_L(t) + \\ + \lambda_1(t)F(X) + \lambda_1(t)\alpha XY + \lambda_2(t)G(Y) - \lambda_2(t)\beta YX \end{aligned} \quad (3.15)$$

Se definen las funciones de conmutación:

$$\sigma_1(t) = e^{-\rho t}(P_m - C_m(X)) - \lambda_1(t) \quad (3.16)$$

$$\sigma_2(t) = e^{-\rho t}(P_L - C_L(Y)) - \lambda_2(t) \quad (3.17)$$

Si $\sigma_1(t) < 0$, el valor de h_m que maximiza el hamiltoniano será $h_m^* = 0$; mientras que si $\sigma_1(t) > 0$, h_m deberá ser tan grande como sea posible para maximizar H , por tanto: $h_m^* = h_m \text{ max}$. De igual forma, si $\sigma_2(t) < 0$, entonces $h_L^* = 0$; y si $\sigma_2(t) > 0$, $h_L^* = h_L \text{ max}$. Este tipo de controles se denominan *controles bang-bang*: si el beneficio marginal

de pescar supera al beneficio marginal de invertir en el recurso, la captura debe ser máxima; en caso contrario, debe ser nula. De esta forma, la solución estacionaria óptima se alcanza por la senda más rápida posible (Spence y Starrett, 1975; Clark, 1976).

Cuando las funciones de conmutación se anulan, los controles óptimos se encuentran dentro de los intervalos de control respectivos H_m y H_L . Entonces se produce el llamado *caso singular*: al anularse la función de conmutación, el hamiltoniano se hace independiente de las variables de control, y el principio del máximo no especifica el valor del control óptimo (Surís y Varela, 1995). Las condiciones de primer orden expresadas en las ecuaciones (3.7) y (3.8) reflejan lo que ocurre en este caso: $\partial H/\partial h_m = 0$ y $\partial H/\partial h_L = 0$; lo cual implica:

$$e^{-\rho t}(P_m - C_m(X)) = \lambda_1(t) \quad (3.18)$$

$$e^{-\rho t}(P_L - C_L(Y)) = \lambda_2(t) \quad (3.19)$$

Por lo tanto se igualan el beneficio marginal de pescar y el beneficio marginal de invertir en los recursos, expresado en sus precios sombra. La trayectoria singular se expresa como:

$$\dot{\lambda}_1 = -\rho e^{-\rho t}(P_m - C_m(X)) \quad (3.20)$$

$$\dot{\lambda}_2 = -\rho e^{-\rho t}(P_L - C_L(Y)) \quad (3.21)$$

A partir del valor actual del hamiltoniano (3.6) y de las condiciones de primer orden expresadas en las ecuaciones (3.9) y (3.10) se obtienen las expresiones:

$$\frac{\partial \lambda_1}{\partial t} = \dot{\lambda}_1 = -\frac{\partial H}{\partial X}$$

$$\dot{\lambda}_1 = e^{-\rho t} C_m'(X) h_m(t) - \lambda_1(t) [F'(X) + \alpha Y] + \lambda_2(t) \beta Y \quad (3.22)$$

$$\frac{\partial \lambda_2}{\partial t} = \dot{\lambda}_2 = -\frac{\partial H}{\partial Y}$$

$$\dot{\lambda}_2 = e^{-\rho t} C_L'(Y) h_L(t) - \lambda_1(t) \alpha X - \lambda_2(t) [G'(Y) - \beta X] \quad (3.23)$$

Sustituyendo en las ecuaciones anteriores (3.18), (3.19), (3.20) y (3.21), se obtiene:

$$-\rho e^{-\rho t}(P_m - C_m(X)) = \quad (3.24)$$

$$= e^{-\rho t} C_m'(X) h_m(t) - e^{-\rho t}(P_m - C_m(X)) [F'(X) + \alpha Y] + e^{-\rho t}(P_L - C_L(Y)) \beta Y$$

$$-\rho e^{-\rho t}(P_L - C_L(Y)) = \quad (3.25)$$

$$= e^{-\rho t} C_L'(Y) h_L(t) - e^{-\rho t}(P_m - C_m(X)) \alpha X - e^{-\rho t}(P_L - C_L(Y)) [G'(Y) - \beta X]$$

Partiendo de las condiciones de primer orden (3.11) y (3.12), se obtienen las expresiones:

$$\frac{\partial H}{\partial \lambda_1} = \dot{X}$$

$$\dot{X} = F(X) - h_m(t) + \alpha XY \quad (3.26)$$

$$\frac{\partial H}{\partial \lambda_2} = \dot{Y}$$

$$\dot{Y} = G(Y) - h_L(t) - \beta Y X \quad (3.27)$$

En estado estacionario, con biomazas X_u e Y_u , $\dot{X}_u = \dot{Y}_u = 0$, por lo tanto:

$$h_{mu} = F(X_u) + \alpha X_u Y_u \quad (3.28)$$

$$h_{Lu} = G(Y_u) - \beta Y_u X_u \quad (3.29)$$

Sustituyendo (3.28) y (3.29) en (3.24) y (3.25), se obtienen las expresiones:

$$\begin{aligned} & -\rho(P_m - C_m(X_u)) = \\ & = C_n[F'(X_u) + \alpha Y_u] - \frac{[P_L - C_L(Y_u)]\beta Y_u + C_m'(X_u)[F(X_u) + \alpha X_u Y_u]}{(P_m - C_m(X_u))} = \rho_u \quad (3.30) \\ & -\rho(P_L - C_L(Y_u)) = \\ & = C_L'(Y_u)[G(Y_u) - \beta Y_u X_u] - (P_m - C_m(X_u))\alpha X_u - (P_L - C_L(Y_u))[G'(Y_u) - \beta X_u]; \\ & [G'(Y_u) - \beta X_u] + \frac{[P_m - C_m(X_u)]\alpha X_u - C_L'(Y_u)[G(Y_u) - \beta Y_u X_u]}{(P_L - C_L(Y_u))} = \rho \end{aligned}$$

(3.31)

Que constituyen un sistema de dos ecuaciones con dos incógnitas, cuya resolución permitirá conocer los niveles de biomasa óptima X_u e Y_u en el estado estacionario. Sustituyendo X_u e Y_u en (3.28) y (3.29) se obtendrán los niveles de captura óptima en el equilibrio, h_{mu} y h_{Lu} .

3.2. ANÁLISIS ECONÓMÉTRICO

Los datos de biomasa y capturas de merluza y bacaladilla a lo largo del periodo estudiado 1988-2014 se sometieron al método de estimación econométrica de *Mínimos Cuadrados Ordinarios* (MCO) con el fin de determinar la forma que adoptan las funciones de crecimiento neto de ambas especies. Se consideran tres posibles expresiones:

Forma cuadrática:

$$X_{t+1} = \alpha X_t - \beta X_t^2 + \gamma X_t Y_t - h_m \quad (3.32) \quad Y_{t+1} = \varphi Y_t - \mu Y_t^2 + \omega X_t Y_t - h_L \quad (3.33)$$

Forma exponencial:

$$X_{t+1} = \alpha e^{\beta X_t} + \gamma X_t Y_t - h_m \quad (3.34)$$

$$Y_{t+1} = \varphi e^{\mu Y_t} + \omega X_t Y_t - h_L \quad (3.35)$$

Forma potencial:

$$X_{t+1} = \alpha e^{\beta X_t + \gamma X_t Y_t} - h_m \quad (3.36)$$

$$Y_{t+1} = \varphi e^{\mu Y_t + w X_t Y_t} - h_L \quad (3.37)$$

A continuación se muestran los resultados obtenidos:

Tabla 2. Modelo 1

Modelo 1: MCO, usando las observaciones 1988-2014 (T = 27)					
Variable dependiente: endomerlu					
	<i>Coficiente</i>	<i>Desv. Típica</i>	<i>Estadístico t</i>	<i>Valor p</i>	
xmer	1.98802	0.114474	17.3666	<0.0001	***
sq_xmer	-2.94291e-06	4.05357e-07	-5.4962	<0.0001	***
xy	1.83165e-09	2.39363e-08	0.0161	0.9873	
Media de la vble. dep.	180815.7	D.T. de la vble. dep.	84253.74		
Suma de cuad. residuos	7.23e+09	D.T. de la regresión	17357.50		
R-cuadrado	0.993225	R-cuadrado corregido	0.992661		
F(3, 24)	1172.854	Valor p (de F)	3.76e-26		
Log-verosimilitud	-300.2893	Criterio de Akaike	606.5787		
Criterio de Schwarz	610.4662	Crit. de Hannan-Quinn	607.7346		
rho	0.488674	Durbin-Watson	0.990641		

Tabla 3. Modelo 2

Modelo 2: MCO, usando las observaciones 1988-2014 (T = 27)					
Variable dependiente: endobacal					
	<i>Coficiente</i>	<i>Desv. Típica</i>	<i>Estadístico t</i>	<i>Valor p</i>	
ybacal	1.49868	0.151384	9.8999	<0.0001	***
sq_ybacal	-8.21632e-08	2.2982e-08	-1.0099	0.3226	
xy	-3.12827e-06	6.59481e-07	-1.3164	0.2005	
Media de la vble. dep.	4658741	D.T. de la vble. dep.	2097691		
Suma de cuad. residuos	1.02e+13	D.T. de la regresión	651719.3		
R-cuadrado	0.985446	R-cuadrado corregido	0.984233		
F(3, 24)	541.6818	Valor p (de F)	3.61e-22		
Log-verosimilitud	-398.1802	Criterio de Akaike	802.3605		
Criterio de Schwarz	806.2480	Crit. de Hannan-Quinn	803.5164		
rho	0.439072	Durbin-Watson	1.120075		

Tabla 4. Modelo 3

Modelo 3: MCO, usando las observaciones 1988-2014 (T = 27)					
Variable dependiente: l_endomerlu					
	<i>Coficiente</i>	<i>Desv. Típica</i>	<i>Estadístico t</i>	<i>Valor p</i>	
xmer	6.2841e-05	2.66062e-05	2.3619	0.0263	**
xy	7.13e-012	7.7206e-012	0.9235	0.3646	
Media de la vble. dep.		11.97023	D.T. de la vble. dep.		0.384159
Suma de cuad. residuos		792.7804	D.T. de la regresión		5.631271
R-cuadrado		0.795283	R-cuadrado corregido		0.787094
F(3, 24)		48.55990	Valor p (de F)		2.45e-09
Log-verosimilitud		-83.93742	Criterio de Akaike		171.8748
Criterio de Schwarz		174.4665	Crit. de Hannan-Quinn		172.6455
rho		0.967083	Durbin-Watson		0.062242

Tabla 5. Modelo 4

Modelo 4: MCO, usando las observaciones 1988-2014 (T = 27)					
Variable dependiente: l_endobacal					
	<i>Coficiente</i>	<i>Desv. Típica</i>	<i>Estadístico t</i>	<i>Valor p</i>	
ybacal	2.85098e-06	5.85171e-07	4.8721	<0.0001	***
xy	8.2693e-012	5.32886e-012	1.5518	0.1333	
Media de la vble. dep.		15.25821	D.T. de la vble. dep.		0.447234
Suma de cuad. residuos		815.3606	D.T. de la regresión		5.710904
R-cuadrado		0.870396	R-cuadrado corregido		0.865211
F(2, 24)		83.94738	Valor p (de F)		8.09e-12
Log-verosimilitud		-84.31655	Criterio de Akaike		172.6331
Criterio de Schwarz		175.2248	Crit. de Hannan-Quinn		173.4037
rho		0.876967	Durbin-Watson		0.169199

Tabla 6. Modelo 5

Modelo 5: MCO, usando las observaciones 1988-2014 (T = 27)					
Variable dependiente: l_endomerlu					
	<i>Coficiente</i>	<i>Desv. Típica</i>	<i>Estadístico t</i>	<i>Valor p</i>	
xyL_xmer	2.01014e-012	2.43724e-013	8.2476	<0.0001	***
Media de la vble. dep.		11.97023	D.T. de la vble. dep.		0.384159
Suma de cuad. residuos		1070.873	D.T. de la regresión		6.417743
R-cuadrado		0.723472	R-cuadrado corregido		0.723472
F(2, 24)		68.02305	Valor p (de F)		9.94e-09

Modelo 5: MCO, usando las observaciones 1988-2014 (T = 27)			
Variable dependiente: l_endomerlu			
Log-verosimilitud	-87.99664	Criterio de Akaike	177.9933
Criterio de Schwarz	179.2891	Crit. de Hannan-Quinn	178.3786
rho	0.985883	Durbin-Watson	0.068781

Tabla 7. Modelo 6

Modelo 6: MCO, usando las observaciones 1988-2014 (T = 27)					
Variable dependiente: l_endobacal					
	Coeficiente	Desv. Típica	Estadístico t	Valor p	
xyL_ybacal	2.03629e-012	2.34986e-013	8.6656	<0.0001	***
Media de la vble. dep.		15.25821	D.T. de la vble. dep.		0.447234
Suma de cuad. residuos		1618.020	D.T. de la regresión		7.888698
R-cuadrado		0.742810	R-cuadrado corregido		0.742810
F(2, 24)		75.09263	Valor p (de F)		3.83e-09
Log-verosimilitud		-93.56849	Criterio de Akaike		189.1370
Criterio de Schwarz		190.4328	Crit. de Hannan-Quinn		189.5223
rho		0.978454	Durbin-Watson		0.075548

Los resultados del análisis de regresión de mínimos cuadrados ordinarios muestran que la forma cuadrática es la más adecuada para las funciones de crecimiento de la merluza y del lirio, presentando un valor de R-cuadrado corregido de 0,992661 para la merluza y de 0,984233 para el lirio (siendo este valor inferior a 0,87 en todos los restantes casos). Además, únicamente las formas cuadráticas presentan un coeficiente de interacción predador-presa positivo para la merluza a la vez que negativo para la bacaladilla, como correspondería a dicha relación trófica. Por ello se seleccionó la forma cuadrática para construir las funciones de crecimiento de la merluza y de la bacaladilla:

$$X_{t+1} = 1,98802 X_t - 0,0000029429 X_t^2 + 0,00000000183165 X_t Y_t - h_m \quad (3.38)$$

$$Y_{t+1} = 1,49868 Y_t - 0,0000000821632 Y_t^2 - 0,00000312827 X_t Y_t - h_L \quad (3.39)$$

3.3. MODELO APLICADO

Una vez seleccionada la forma cuadrática para las funciones de crecimiento de la merluza y el lirio, se retomaron las expresiones (3.30) y (3.31) del modelo teórico para sustituir en ellas los términos correspondientes. Dado que las funciones son cuadráticas:

$$X_{t+1} = \alpha X_t - \beta X_t^2 + \gamma X_t Y_t - h_m \quad Y_{t+1} = \varphi Y_t - \mu Y_t^2 + \omega X_t Y_t - h_L$$

Los términos a sustituir serán:

$$F(X) = \alpha X_t - \beta X_t^2; \quad F'(X) = \alpha - 2\beta X_t$$

$$G(Y) = \varphi Y_t - \mu Y_t^2; \quad G'(Y) = \varphi - 2\mu Y_t$$

Por lo que respecta a los costes de captura, los términos a sustituir serán las funciones de costes y sus respectivas derivadas:

$$\begin{aligned} C_m(X_t) &= a - bX_t; & C_m'(X_t) &= -b \\ C_L(Y_t) &= c - dY_t; & C_L'(Y_t) &= -d \end{aligned}$$

Las expresiones (3.30) y (3.31) adoptan ahora la siguiente forma:

$$[(\alpha - 2\beta X_u) + \gamma Y_u] - \frac{[P_L - (c - dY_u)]\omega Y_u + (-b)[(\alpha X_u - \beta X_u^2) + \gamma X_u Y_u]}{P_m - (a - bX_u)} = \rho \quad (3.30')$$

$$[(\varphi - 2\mu Y_u) - \omega X_u] + \frac{[P_m - (a - bX_u)]\gamma X_u - (-d)[(\varphi Y_u - \mu Y_u^2) - \omega Y_u X_u]}{P_L - (c - dY_u)} = \rho \quad (3.31')$$

Por lo que respecta a las expresiones de captura óptima, se retomaron las ecuaciones (3.28) y (3.29), que, para funciones cuadráticas, adoptan la forma:

$$h_{mu} = \alpha X_u - \beta X_u^2 + \alpha X_u Y_u \quad (3.28')$$

$$h_{Lu} = \varphi Y_u - \mu Y_u^2 - \beta Y_u X_u \quad (3.29')$$

Las expresiones de las biomazas de máximo rendimiento sostenible, X_{mrs} e Y_{mrs} , se obtienen partiendo de $F(X)$ y $G(Y)$ (incluyendo los términos de interacción predador-presa), igualando $F'(X)$ y $G'(Y)$ a cero:

$$\begin{aligned} F(X) &= \alpha X_t - \beta X_t^2 + \gamma X_t Y_t; & F'(X) &= \alpha - 2\beta X_t + \gamma Y_t; \\ G(Y) &= \varphi Y_t - \mu Y_t^2 - \omega X_t Y_t; & G'(Y) &= \varphi - 2\mu Y_t - \omega X_t; \end{aligned}$$

$$F'(X) = 0; \quad Y_t = \frac{\alpha - 2\beta X_t}{\gamma}$$

$$G'(Y) = 0; \quad Y_t = \frac{\varphi - \omega X_t}{2\mu}$$

$$\frac{\alpha - 2\beta X_t}{\gamma} = \frac{\varphi - \omega X_t}{2\mu}$$

$$X_{mrs} = \frac{\frac{\alpha}{\gamma} - \frac{\varphi}{2\mu}}{-\omega + \frac{2\beta}{2\mu} + \frac{2\beta}{\gamma}} \quad (3.40)$$

$$Y_{mrs} = \frac{\alpha - 2\beta X_{mrs}}{\gamma} \quad (3.41)$$

Las expresiones (3.30') y (3.31') constituyen un sistema de dos ecuaciones con dos incógnitas, X_u e Y_u . Dicho sistema de ecuaciones fue resuelto mediante iteraciones con el fin de determinar los valores óptimos de las biomazas de merluza y bacaladilla, sustituyendo en las ecuaciones los promedios 2001-2014 de los precios en unidades monetarias constantes de 2014, las funciones de costes de captura y la tasa de descuento $\rho = 0,05$. Los valores de biomazas óptimas obtenidos fueron los siguientes: $X_u = 281.000$ toneladas e $Y_u = 4.871.500$ toneladas. Las biomazas de máximo rendimiento sostenible se calcularon mediante las expresiones (3.40) y (3.41), obteniendo: $X_{mrs} = 336.922$ toneladas e $Y_{mrs} = 2.706.178$ toneladas.

Una vez conocidos los valores de las biomazas óptimas de ambas especies, se introdujeron en las expresiones (3.28') y (3.29'), obteniéndose los siguientes valores de captura óptima: $h_{mu} = 328.766$ toneladas y $h_{Lu} = 1.068.700$ toneladas. El elevado valor de captura óptima de merluza, superior a su biomasa óptima, es explicable porque corresponde al momento final del año, siendo por tanto una cifra acumulativa, mientras que el dato de biomasa óptima está calculado en base a una serie de estimaciones anuales realizadas por ICES en un momento indeterminado del año, pudiendo aumentar considerablemente hacia el final del mismo debido al rápido crecimiento de esta especie. Según las estimaciones realizadas, el parámetro α es igual a 1,988, indicando que cada tonelada de merluza en libertad aportaría adicionalmente en un año casi el doble de su peso, por reproducción e incremento de peso con la alimentación. El parámetro $\beta = 0,00000294$ indica que el 82% de la biomasa inicial se vería afectada por mortalidad natural (representando en torno al 42% del crecimiento natural), y el coeficiente de interacción predator-presa $\gamma = 0,0000000183$ representa un incremento de un 0,9% de la biomasa inicial debido a la depredación de lirio (un 0,5% del crecimiento natural). Por lo tanto, en ausencia de captura, el crecimiento neto por tonelada sería de: $1,988 + 0,009 - 0,82 = 1,177$ t., alcanzándose al final de año 2,177 t. por cada tonelada inicial. Dada la forma cuadrática de la función de crecimiento natural de la biomasa, este crecimiento es el máximo posible al ser el tamaño de la biomasa óptima (281.000 t) menor que el de la biomasa de máximo rendimiento sostenible, pero próximo a esta.

Con el fin de alcanzar un equilibrio estacionario estable, la captura debería igualar al crecimiento neto resultante (1,177 t. por cada tonelada de biomasa inicial). Ello explica que la captura óptima anual supere a la biomasa inicial del año (nunca a la final), y justifica que a lo largo de la serie de datos de ICES las capturas en peso estén en ocasiones muy próximas o incluso por encima de la biomasa de reproductores sin que se produzca la extinción del recurso o el colapso de la pesquería.

Por otra parte, el stock estimado por ICES aún estaría alejado del óptimo estimado por este modelo (unas 281.000 t). A lo largo de la serie temporal, ha estado por debajo de las 100.000 t entre 1989 y 2006, y solo recientemente (de 2009 en adelante) ha llegado a las 200.000 t. Si se lograra alcanzar la biomasa óptima, las posibilidades de capturas sostenibles se triplicarían (de unas 100.000 t actuales a casi 330.000 t del óptimo).

Por lo que se refiere a los precios sombra de merluza y bacaladilla, fueron calculados partiendo de las expresiones (3.18) y (3.19), introduciendo la tasa de descuento $\rho = 0,05$, los promedios 2001-2014 de los precios en euros de 2014 y las funciones de costes de captura, obteniendo los siguientes resultados: $\lambda_1 = 3.044,54$ €/t. y $\lambda_2 = 171,40$ €/t., o lo que es lo mismo: $\lambda_1 = 3,04$ €/Kg y $\lambda_2 = 0,17$ €/Kg.

Los beneficios producidos por la captura de ambas especies fueron calculados partiendo de la expresión (3.3), introduciendo los promedios 2001-2014 de los precios, las funciones de costes de captura y los valores de captura óptima, obteniendo: $\pi_m = 1.052,26$ millones de euros, $\pi_L = 192,57$ millones de euros y $\pi_{total} = 1.244,83$ millones de euros.

Tabla 8. Valores óptimos de las capturas y biomاسas de merluza y lirio, precios sombra y beneficios de las capturas de ambas especies.

	Merluza	Bacaladilla
Biomasa óptima	281.000 t.	4.871.500 t.
Captura óptima	328.766 t.	1.068.700 t.
Biomasa de MRS	336.922 t.	2.706.178 t.
Precios sombra	3.044,54 €/t.	171,40 €/t.
Beneficios	1.052,26 mill. €	192,57 mill. €
Beneficios totales	1.244,83 mill. €	

4. ANÁLISIS DE SENSIBILIDAD

Con el fin de determinar el efecto que tendría sobre las soluciones óptimas proporcionadas por el modelo el hecho de que los parámetros tomen otros posibles valores, se sometió al modelo a un análisis de sensibilidad consistente en la realización de diferentes simulaciones en las que se asignaron nuevos valores a la tasa de descuento y a los precios de merluza y bacaladilla, volviendo a calcular a continuación los valores óptimos de biomاسas, capturas, precios sombra y beneficios generados por la captura de ambas especies.

4.1. SENSIBILIDAD DE LOS RESULTADOS DE BIOMASAS Y CAPTURAS ÓPTIMAS

En primer lugar se realizaron simulaciones de variación de la tasa de descuento ρ para comprobar su efecto sobre los resultados de biomاسas y capturas óptimas. Partiendo de las expresiones (3.30') y (3.31'), se introdujeron nuevos valores de ρ (-0,05; 0; 0,10 y 0,15) y se resolvieron mediante iteraciones. Los valores de biomاسas óptimas obtenidos se sustituyeron en las expresiones (3.28') y (3.29'), obteniendo los valores de capturas óptimas correspondientes a cada tasa de descuento.

A continuación se realizaron las simulaciones de variación de precios de merluza y bacaladilla. En primer lugar, se comprobó el efecto del incremento y la disminución del precio de la merluza sobre las biomاسas y capturas óptimas de ambas especies. En segundo lugar, se hizo lo mismo con el precio del lirio. Por último, se repitió la operación con la variación simultánea de los precios de ambas especies, considerando su incremento y disminución simultánea, y el incremento de cada uno frente a la disminución del otro. Los resultados se muestran en el cuadro 4.1. Los valores marcados en negrita son los obtenidos inicialmente con $\rho = 0,05$ y precios reales (ver tabla 8 y 9), y se incluyen a efectos comparativos y para corroborar las tendencias observadas en los resultados.

Tabla 9. Valores de las biomásas óptimas, X_u e Y_u , capturas óptimas, h_{mu} y h_{Lu} y porcentajes capturas/biomasa obtenidos de las simulaciones de variación de tasas de descuento y precios de merluza y bacaladilla (toneladas).

Simulaciones		X_u	Y_u	h_{mu}	h_{Lu}	h_m/X_u	h_L/Y_u
rho	-0,05	297.500	4.905.500	333.643	809.251	112,15 %	16,50 %
	0	290.500	4.882.300	331.765	921.642	114,20 %	18,88 %
	0,05	281.000	4.871.500	328.766	1.068.700	117,00 %	21,94 %
	0,1	275.000	4.812.750	326.572	1.169.377	118,75 %	24,30 %
	0,15	269.000	4.753.000	324.167	1.267.405	120,51 %	26,67 %
P_m	P_L						
4400	399,13	288.500	4.721.000	331.093	983.298	114,76 %	20,83 %
4500	399,13	287.500	4.755.900	330.810	991.807	115,06 %	20,85 %
4.619,23	399,13	281.000	4.871.500	328.766	1.068.700	117,00 %	21,94 %
4700	399,13	278.000	4.931.900	327.741	1.103.760	117,89 %	22,38 %
4800	399,13	277.000	4.969.300	327.396	1.112.406	118,19 %	22,39 %
P_L	P_m						
300	4.619,23	268.000	5.879.800	324.304	1.041.903	121,01 %	17,72 %
350	4.619,23	270.000	5.483.000	324.939	1.116.044	120,35 %	20,35 %
399,13	4.619,23	281.000	4.871.500	328.766	1.068.700	117,00 %	21,94 %
450	4.619,23	285.500	4.188.700	329.893	1.094.934	115,55 %	26,14 %
500	4.619,23	291.000	3.586.000	331.217	1.053.266	113,82 %	29,37 %
P_m	P_L						
4700	450	264.000	4.710.000	322.006	1.346.250	121,97 %	28,58 %
4500	350	310.000	5.110.100	336.374	557.278	108,51 %	10,91 %
4.619,23	399,13	281.000	4.871.500	328.766	1.068.700	117,00 %	21,94 %
4700	350	278.000	5.450.000	328.005	987.712	117,99 %	18,12 %
4500	450	290.000	4.100.000	331.205	1.043.912	114,21 %	25,46 %

4.2. SENSIBILIDAD DE LOS RESULTADOS DE PRECIOS SOMBRA

Partiendo de las expresiones (3.18) y (3.19), los precios sombra fueron recalculados introduciendo los nuevos valores de la tasa de descuento ρ y los valores de biomásas óptimas correspondientes. A continuación se realizaron las mismas simulaciones de variación de precios de merluza y lirio que en el apartado 4.1, incluyendo porcentajes de incremento y disminución respecto de los precios sombra iniciales. Los resultados se muestran en el cuadro 4.2.

Tabla 10. Valores de los precios sombra, λ_1 y λ_2 y porcentajes de incremento y disminución respecto de los iniciales obtenidos de las simulaciones de variación de tasas de descuento y precios de merluza y bacaladilla (euros/tonelada).

Simulaciones		Lambda 1	Lambda 2	% variac. λ_1	% variac. λ_2
rho	-0,05	3.460,13	190,86	113,7%	111,4%
	0	3.252,88	180,62	106,8%	105,4%
	0,05	3.044,54	171,40	100,0%	100,0%
	0,1	2.866,19	160,92	94,1%	93,9%
	0,15	2.698,00	151,01	88,6%	88,1%
P_m	P_L				
4400	399,13	2.875,23	165,67	94,4%	67,4%

Simulaciones		Lambda 1	Lambda 2	% variac. λ_1	% variac. λ_2
4500	399,13	2.965,12	167,00	97,4%	86,3%
4.619,23	399,13	3.044,54	171,40	100,0%	100,0%
4700	399,13	3.105,67	173,70	102,0%	113,1%
4800	399,13	3.195,56	175,21	105,0%	127,4%
P_L	P_m				
300	4.619,23	2.976,52	115,47	97,8%	96,7%
350	4.619,23	2.986,99	147,94	98,1%	97,4%
399,13	4.619,23	3.044,54	171,40	100,0%	100,0%
450	4.619,23	3.068,08	193,81	100,8%	101,3%
500	4.619,23	3.096,85	218,44	101,7%	102,2%
P_m	P_L				
4700	450	3.032,42	213,65	99,6%	124,6%
4500	350	3.082,84	133,75	101,3%	78,0%
4.619,23	399,13	3.044,54	171,40	100,0%	100,0%
4700	350	3.105,67	146,68	102,0%	85,6%
4500	450	2.978,20	190,44	97,8%	111,1%

4.3. SENSIBILIDAD DE LOS RESULTADOS DE BENEFICIOS

Los beneficios generados por la captura de merluza y bacaladilla se sometieron también a simulaciones de variación de la tasa de descuento, partiendo de la expresión (3.3) e introduciendo los valores correspondientes de biomazas y capturas. A continuación, se volvieron a calcular introduciendo los precios de las anteriores simulaciones y los correspondientes valores de biomazas y capturas, incluyendo porcentajes de incremento y disminución respecto de los beneficios iniciales. Los resultados se muestran en el cuadro 4.3.

Tabla 11. Valores de las capturas (toneladas) y los beneficios producidos, π_m , π_L y π_{total} (millones de euros) y porcentajes de incremento y disminución respecto de los beneficios iniciales obtenidos de las simulaciones de variación de tasas de descuento y precios de merluza y bacaladilla.

Simulaciones		h_m	h_L	π_m	π_L	π_{total}	var. π_m	var. π_L	var. π_{total}
rho	-0,05	333.643	809.251	1.098,15	146,92	1.245,07	104,4%	76,3%	100,0%
	0	331.765	921.642	1.079,19	166,47	1.245,66	102,6%	86,4%	100,1%
	0,05	328.766	1.068.700	1.052,26	192,57	1.244,83	100,0%	100,0%	100,0%
	0,1	326.572	1.169.377	1.034,46	207,96	1.242,42	98,3%	108,0%	99,8%
	0,15	324.167	1.267.405	1.016,14	222,36	1.238,51	96,6%	115,5%	99,5%
P_m	P_L								
4400	399,13	331.093	983.298	1.000,78	171,26	1.172,04	95,1%	88,9%	94,2%
4500	399,13	330.810	991.807	1.031,18	174,13	1.205,31	98,0%	90,4%	96,8%
4.619,23	399,13	328.766	1.068.700	1.052,26	192,57	1.244,83	100,0%	100,0%	100,0%
4700	399,13	327.741	1.103.760	1.070,04	201,55	1.271,60	101,7%	104,7%	102,2%
4800	399,13	327.396	1.112.406	1.099,85	204,79	1.304,65	104,5%	106,4%	104,8%
P_L	P_m								
300	4.619,23	324.304	1.041.903	1.014,79	126,48	1.141,27	96,4%	65,7%	91,7%
350	4.619,23	324.939	1.116.044	1.020,35	173,57	1.193,92	97,0%	90,1%	95,9%
399,13	4.619,23	328.766	1.068.700	1.052,26	192,57	1.244,83	100,0%	100,0%	100,0%

Simulaciones		h_m	h_L	π_m	π_L	π_{total}	var. π_m	var. π_L	var. π_{total}
450	4.619,23	329.893	1.094.934	1.064.03	223,09	1.287,12	101,1%	115,9%	103,4%
500	4.619,23	331.217	1.053.266	1.078,32	241,87	1.320,19	102,5%	125,6%	106,1%
P_m	P_L								
4700	450	322.006	1.346.250	1.026,52	302,37	1.328,89	97,6%	157,0%	106,8%
4500	350	336.374	557.278	1.090,15	78,35	1.168,51	103,6%	40,7%	93,9%
4.619,23	399,13	328.766	1.068.700	1.052,26	192,57	1.244,83	100,0%	100,0%	100,0%
4700	350	328.005	987.712	1.070,90	152,30	1.223,21	101,8%	79,1%	98,3%
4500	450	331.205	1.043.912	1.036,97	208,99	1.245,96	98,5%	108,5%	100,1%

5. CONCLUSIONES

A lo largo de este trabajo de investigación se ha desarrollado la aplicación de un modelo bioeconómico multiespecífico del tipo predador-presa a la pesquería mixta de merluza y bacaladilla de las aguas comunitarias atlánticas de la Unión Europea. Ambas especies presentan una interacción trófica significativa, además de una importancia comercial para la flota pesquera europea que las hace adecuadas para aplicar un modelo de este tipo.

Tras la construcción del modelo teórico utilizando el principio del máximo de la teoría del control óptimo, se realizó un análisis econométrico de los datos de biomasa y capturas de merluza y bacaladilla (periodo 1988-2014) utilizando el método MCO. Una vez conocida la forma cuadrática de las funciones de crecimiento, se resolvió el modelo aplicado, obteniendo unos valores de biomasa óptima de 281.000 t. de merluza y 4.871.500 t. de bacaladilla, unos valores de captura óptima de 328.766 t. de merluza y 1.068.700 t. de bacaladilla y unos valores de biomasa de máximo rendimiento sostenible de 336.922 t. de merluza y 2.706.178 t. de bacaladilla.

Así mismo, se determinaron unos precios sombra de 3.044,54 €/t. de merluza y 171,40 €/t. de bacaladilla, y unos beneficios económicos de 1.052,26 millones de euros para la merluza y 192,57 millones de euros para la bacaladilla, siendo el beneficio total de la pesquería mixta de merluza y bacaladilla en aguas comunitarias de 1.244,83 millones de euros.

La captura efectiva de merluza es mayor con tasas de captura bajas. La selección de bajas tasas de descuento conduce a resultados de capturas más eficientes que el empleo de tasas de descuento altas.

La gestión de la pesquería mixta comunitaria de merluza y bacaladilla debe basar sus objetivos y medidas técnicas en la utilización de tasas de descuento próximas a cero. El máximo beneficio económico se alcanza ejerciendo una baja presión relativa sobre el recurso.

A la hora de gestionar la pesquería, se debe tener presente la posible influencia de las medidas técnicas sobre los precios de la merluza. Las soluciones óptimas se muestran altamente sensibles ante variaciones de este precio.

REFERENCIAS

- BROWN, G., BERGER, B. y IKIARA, M. 2005. *A Predator-Prey Model with an Application to Lake Victoria Fisheries*. Marine Resource Economics, Volume 20, 221–247.
- CABRAL, H. N., y MURTA, A. G. (2002). *The diet of blue whiting, hake, horse mackerel and mackerel off Portugal*. Journal of Applied Ichthyology, 18(1), 14-23.
- CLARK, C.W. y MUNRO, G. R. 1975. *The economics of fishing and modern capital theory: a simplified approach*. Journal of Environmental Economics and Management, 5(2), 96–106.
- CLARK, C. W. 1976, *Mathematical Bioeconomics - the Optimal Management of Renewable Resources*, J. Wiley and Sons, Sussex.
- COMISIÓN EUROPEA. 2005. *Reglamento (CE) No 2166/2005 del Consejo de 20 de diciembre de 2005 por el que se establecen medidas para la recuperación de la población sur de merluza europea y de cigalas en el mar Cantábrico y en el oeste de la Península Ibérica y se modifica el Reglamento (CE) no 850/98 para la conservación de los recursos pesqueros a través de medidas técnicas de protección de los juveniles de organismos marinos*. Diario Oficial de las Comunidades Europeas, L 345, 10 p.

- GARZA-GIL, M-D. y VARELA-LAFUENTE, M.M. 2007. *Bioeconomic Management and Fishing Selectivity: An Application to the European Hake Fishery*. Journal of Agricultural and Biological Sciences, 2, pp. 69–74.
- GONZALEZ, R., OLASO, I., y Pereda, P. (1985). *Contribución al conocimiento de la alimentación de la merluza (Merluccius merluccius L.) en la plataforma continental de Galicia y del Cantábrico*. Boletín del Instituto Español de Oceanografía, 2, 49–60.
- GUICHET, R., y MERIEL-BUSSY, M., 1970. *Association du merlu Merluccius merluccius (L.) et du merlan bleu Micromesistius poutassou (Risso) dans le Golfe de Gascogne*. Revue des Travaux de l'Institut des Peches Maritimes, 34(1), 69-72.
- Guichet, R., 1995: *The diet of European hake (Merluccius merluccius) in the northern part of the Bay of Biscay*. ICES Journal of Marine Science, 52, 21-31.
- ICES. 2008. Report of the ICES Advisory Committee, 2008. ICES Advice, 2008. Book 7, 122 p.
- ICES. 2009. Report of the ICES Advisory Committee, 2009 ICES Advice, 2009. Book 7, 77 p.
- LOTKA, A.J. 1932. *The growth of mixed populations: two species competing for a common food supply*. Journal of the Washington Academy of Sciences, 22, 461–469.
- MAHE, K., AMARA, R., BRYCKAERT, T., KACHER, M., y BRYLINSKI, J. M. 2007. *Ontogenetic and spatial variation in the diet of hake (Merluccius merluccius) in the Bay of Biscay and the Celtic Sea*. ICES Journal of Marine Science, 64, 1210–1219.
- ROZONOER, L. I. 1959. L.S. *Pontryagin's Maximum Principle in Optimal Control Theory*. Automat, i Telemekh., 20.
- SÁNCHEZ, F., 1993. *Las comunidades de peces de la plataforma del Cantábrico*. Publicación Especial del Instituto Español de Oceanografía No. 13, 137 p.
- SPENCE, M. y STARRETT, D. 1975. *Most Rapid Approach Paths in Accumulation Problems*. International Economic Review, vol. 16, núm. 2.
- SURÍS, J.C. y VARELA, M.M. 1995. *Introducción a la Economía de los Recursos Naturales*. Ed. Civitas, Madrid. 133 p.
- VELASCO, F. y OLASO, I. 1998a. *European Hake Merluccius merluccius (L., 1758) feeding in the Cantabrian Sea: seasonal, bathymetric and length variations*. Fisheries Research, 38, 33-44.
- VELASCO, F., OLASO, I., y SÁNCHEZ, F. 2003. *Annual variations in the prey of demersal fish in the Cantabrian Sea and their implications for food web dynamics*. ICES Marine Science Symposia, 219, 408–410.
- VOLTERRA, V. 1926. *Fluctuations in the abundance of species, considered mathematically*. Nature, 118, 558–560.

TEORÍAS DE LA CONDUCTA DEL PESCADOR: UN ANÁLISIS DE LA PESCA ARTESANAL EN GALICIA

FERNANDO GONZÁLEZ LAXE

Facultad de Economía y Empresa/Universidade da Coruña
e mail: laxe@udc.es

Resumen

Este artículo proporciona pistas de reflexión sobre la conducta de los pescadores. Muestra los diferentes intereses de los actores y las distintas estrategias que se acuerdan para la aplicación de las normas relacionadas con los modos de gestión. Se abordan tres lógicas. Las primeras, están configuradas desde la dimensión macro-social, en donde se objetivan los distintos actores atendiendo a sus previsiones a la hora de cumplir las normas. Las segundas, buscan como objetivo optimizar la estrategia de los actores en orden a aplicar y aceptar una pesca sostenible y con respeto a las normas. Y las terceras, se basan en el análisis de la teoría de juegos de los actores y sus diferentes apuestas.

La combinación de ambas permite establecer diferentes comportamientos a la hora de instrumentalizar las diversas estrategias referidas a la conducta del pescador. Se diferencian tres retos: un reforzamiento de los objetivos productivistas; el mantenimiento de una actitud tradicional; y, finalmente, una adaptación a las nuevas circunstancias.

Se explicita el caso de la actividad artesanal de Galicia y se analizan la alta volatilidad de las decisiones públicas; las dinámicas de conflicto y consenso; y los mecanismos de resistencia al cambio.

Palabras clave: recursos comunes, regulación acceso, sistema en base a derechos, pesca artesanal.

Abstract

This work provides hints of reflection on the conduct of the fisherman. It shows the different interests of the actors and the different strategies that are agreed in the application of the norms related to the modes of management. Three logics are approached. The first one are those configured from the macro-social dimension, where the different actors are objective according to their forecasts in accordance with the norms dictated by institutions. The second objective is to optimize the strategy of the actors in order to achieve a sustainable fishing by means of the follow-up of the norms. And the third are band on the analysis of the game theory of the actors and their different bets.

The combination of both logics allows establishing different behaviors of the fishermen. We differentiate three challenges: reinforcement of the objectives productivity; maintaining a traditional activity; and adaptation to the new circumstances.

The case of artisanal fishing in Galicia is explained and the high volatility of public decisions; the dynamics of conflict and consensus; and the mechanisms of resistance to changes are analyzed.

Key Words: common-pool resources, access regulation, rights-based system, small-scale fisheries.

Eje Temático 10 : Economía Azul. Del Mar y Actividades Marítimas

1. INTRODUCCIÓN

La relación entre la economía y el sector pesquero es muy compleja. De una parte, la economía no deja de ser un subsistema del ambiente y depende de éste para proveerse de recursos y de insumos. El sector pesquero es una actividad con múltiples implicaciones -muchas de ellas no previsibles- y dirigidas a la extracción de los recursos ícticos cuyas notas relevantes son: su sustractividad, su indivisibilidad, su movilidad, su no linealidad; y su carácter fugitivo.

Los mercados no son capaces, en todos los supuestos, de incorporar en sus análisis a los recursos naturales renovables. J.C. Seijo et al. (1997) lo achaca a tres causas: a) no todas las condiciones de la competencia perfecta se cumplen de manera regular; b) los supuestos de asignación óptima, rara vez se cumplen; y c) los regímenes de los derechos de propiedad de los recursos, que privilegian las atribuciones y las limitaciones de usos, son excluyentes para unos y generan comportamientos de máxima rivalidad. Ello supone la existencia de fallos en el mercado, bien propiciados por las ineficiencias económicas, por la subvaloración de los recursos, por la inequidad distributiva de las normas, o por el sobre-aprovechamiento de los recursos. Por tanto, los fallos del mercado son las externalidades negativas (aquellas que se producen cuando la actividad de un proceso repercute sobre el bienestar de otros agentes económicos que no están directamente involucrados en la actividad y sin que puedan llegar a percibir un precio o recibir una compensación por ello). En suma, los productos pesqueros son bienes de propiedad pública con dos características: la no exclusividad y la rivalidad.

La ciencia pesquera se concentra, en primer lugar, sobre los problemas de los flujos de los recursos y de las externalidades derivadas de la apropiación de los mismos; de los sistemas de gestión pre-existentes; y de los problemas de distribución y externalidades tecnológicas. La ciencia pesquera, posteriormente, centra su atención en la modelización de los procesos biológicos y físicos, así como sobre los impactos económicos derivados de la explotación y de otros procesos desconocidos en una primera fase, aunque luego puedan llegar a ser conocidos y evaluados. De ahí que los sistemas de gestión se focalicen en las regulaciones técnicas y en los mecanismos de la incompatibilidad entre las distintas herramientas y objetivos.

La economía de los recursos naturales enmarca dos especificidades muy relevantes: la primera, la existencia de una inter-acción entre la explotación y el recurso natural, así como por la rivalidad por el uso del recurso; y, la segunda especificidad viene dada por los criterios de una externalidad, a través de la explotación de un recurso en régimen de competencia o rivalidad por su uso. De esta forma, resulta necesario responder a cuestiones tales como ¿Qué cantidad de recursos se pueden extraer?, ¿Cómo regular el acceso al recurso para evitar la sobre explotación?, ¿Qué herramientas de política pesquera tenemos a disposición?.

En la tragedia de los comunes, Hardin (1968) subraya que el objeto de explotación individual no se corresponde con el óptimo social, en la medida que el beneficio marginal que un pescador puede extraer de la explotación de una unidad de recurso suplementario es superior al coste marginal individual. Es decir, el coste de la externalidad sobre el stock es compartido entre todos los usuarios. Hardin planteaba estas cuestiones al reseñar que estamos inmersos en ecosistemas sociales, donde existen rivales y no pueden ser excluidos; y donde no existen derechos de propiedad, con lo que el acceso es libre y conlleva, de no regularse de otra forma, a una situación de sobre-explotación.

Los modelos de Schaefer y Gordon revelaron un avance en la explicación de la gestión pesquera. Por una parte, la tasa de crecimiento natural del recurso depende de la biomasa del recurso, de la capacidad de carga del ecosistema y de las funciones de regeneración del recurso renovable. Por otra parte, las condiciones de equilibrio estarían compuestas por aquel estadio que garantice los mecanismos que permitan que la diferencia entre la renta de las pesquerías y sus costes sean positivos.

El modelo Schaefer (1954) establecía que $C(t) = q \cdot f(t) B(t)$; donde las capturas dependen del esfuerzo de pesca y de la biomasa de las poblaciones de peces en el tiempo t ; y q es el coeficiente de capturabilidad, definido como la fracción de la población que es extraída por una unidad de esfuerzo. Por tanto, existen dos variables claves: el esfuerzo y la biomasa; y el factor limitante es la capturabilidad. Cuando la población de la especie está en equilibrio, la tasa de incremento de la población pesquera repone las pérdidas habidas por la mortalidad de las mismas ($dB/dt=0$). De esta forma, el rendimiento en situación de equilibrio vendría definido por $C(t) = r \cdot B (1 - B/K)$, donde r es la tasa intrínseca de crecimiento de la población y K la capacidad de carga.

La biomasa en equilibrio se correspondería con la ecuación $B_e = (1 - q \cdot f/r)K$; donde para un nivel dado de esfuerzo la población en equilibrio (B_e) será cuando la tasa de captura sea igual a la del crecimiento .

En consecuencia, si deseamos relacionar dicho parámetro de captura con el esfuerzo, la ecuación sería: $C = qf \cdot K (1 - q \cdot f/r)$; donde la captura C para un esfuerzo (f) es denominado rendimiento sostenible en las poblaciones en equilibrio, dado que las pérdidas por mortalidad natural y por pesca son compensados por los incrementos poblacionales derivados de los crecimientos individuales y del reclutamiento.

Sin duda alguna, los modelos biológicos poseen restricciones notables, pero vienen siendo utilizados como base doctrinal para la mayor parte de las estrategias pesqueras. Gordon (1954) aborda la manera de clarificar, en términos económicos, el concepto de sobre-pesca en pesquerías no reguladas. En términos sencillos las ecuaciones claves son las siguientes. Las capturas totales son proporcionales al esfuerzo pesquero y a la abundancia del stock. Si se produjera una disminución del recurso explotado la ecuación tomaría una forma de este tipo: $B_{t+1} - B_t = f(B_t) - q \cdot f \cdot B \cdot E$; esto es, en función del stock, de un coeficiente de capturabilidad vinculado a la existencia de stock y del esfuerzo llevado cabo. Y, en lo que atañe a los ingresos netos, éstos vendrán dados de restar a los ingresos totales sostenidos los costes totales $IT = ITS - CT$; o, lo que es lo mismo, el beneficio $N = p \cdot c - cf$; donde p es el precio de la especie y c los costes por unidad de esfuerzo. De esta forma, $N = (p \cdot q \cdot B - C) \cdot f$, es decir, hemos definido los ingresos en función del esfuerzo.

Las condiciones de equilibrio del modelo bio-económico vendrán dadas cuando la biomasa (B_{ebe}) = $C/q \cdot p$; lo que vienen a decir que si la curva de costes totales intersecta con la curva de ingresos totales, con niveles de esfuerzo superiores a los requeridos por operar en rendimientos máximos sostenidos, se demuestra que hay sobre explotación; y, en segundo lugar, antes de que se agote el recurso, la explotación deja de ser rentable; por tanto, nunca estaría en extinción.

La teoría económica aplicada a la gestión de pesquerías considera, por lo tanto, a los pescadores, embarcaciones y flotas como productores o empresas, que desean maximizar sus beneficios. E intenta explicar como se generan las decisiones que adoptan los pescadores teniendo en cuenta sus alternativas de elección, de eliminación de grados de incertidumbre y de acatamiento de las regulaciones. De ahí la necesidad de incluir factores que tienen implicaciones relevantes respecto a las motivaciones de acatamiento y respeto por generar compromisos compartidos.

Los economistas plantearon, allá por los años 50 del pasado siglo, un modelo bio-económico (Schaefer, 1957) conforme a dichas características. Sin embargo, el manejo de los bienes naturales de uso común, típico de los recursos pesqueros, siguieron prácticas diferentes. Para la escuela neoliberal, la mejor manera de utilizar sosteniblemente el recurso es la propiedad privada. Para la escuela institucionalista, el manejo pesquero se fundamenta en dos rasgos: debe ser de acceso limitado y debe estar determinado por el tipo de consumo en base al primero, los bienes pueden ser de acceso limitado y de acceso libre, La falta de normativas sobre este aspecto conduciría a una máxima competencia entre pescadores (y cada uno tentará de capturar el mayor volumen posible) propiciando un agotamiento de los recursos.

Bromley (1995) introduce la necesidad de especificar el valor de uso que es capaz de generar un bien. De ahí que el manejo en lo que concierne a los recursos pesqueros significa que la producción pesquera no solo será evaluada como recurso; sino también como producto, condicionando con ello las posibilidades de nuevas entradas en el mercado y la búsqueda de beneficios y lucros con el trabajo desarrollado.

McCay & Acheson (1987) y Ostrom (1990) indican que varias comunidades pesqueras poseen capacidad para administrar sus bienes de propiedad común y de manera sostenible por medio de conductas estrictas en el grupo (esto es, mediante derechos y deberes). Aunque Ostrom (1990) especifica que, para lograr un mayor nivel de efectividad, el grupo local ha de poseer varias condiciones: a) tomar conciencia de las ventajas; b) poseer medios y normas para asegurar el funcionamiento; c) poseer criterio para determinar las formas de acceso y utilización del recurso pesquero; d) conseguir que prevalezca la racionalidad del grupo social; e) y basarse en la lógica económica neoclásica.

¿Qué se reclama? Tener en consideración dos variables: el espacio y la territorialidad; en la medida que ambas cualidades generan un mayor poder de dirección; lograr un grupo más organizado capaz de ser gerenciable; mejores capacidades en las resoluciones de los conflictos; y necesidad de definir reglas de uso y de cooperación. A pesar de dicha enumeración de criterios, Ostrom (2004) no deja de afirmar la dificultad de su puesta en práctica. Y, North (1990), por su parte, recoge en sus análisis que la elección de los individuos obedecen tanto a factores económicos como a los no-económicos (altruismo, gustos, preferencias, ideologías,...). Esto es, la racionalidad de los individuos es limitada y se inscribe en unos escenarios marcados por la incertidumbre y la subjetividad, derivada de las condiciones de incerteza, propias de la dimensión humana, y de las asimetrías de la información.

La teoría institucional parte de que las propias instituciones son el centro de las actividades económicas, siendo las reglas las que dan sustento a las formulaciones. North (1990) establece reglas formales (políticas, jurídicas económicas, contratos) que reglamentan la propiedad y sus regulaciones; y de reglas informales (mas complejas y que en general incluyen códigos de conductas, culturas, tradiciones, valores, costumbres e ideologías formadas en el seno de la sociedad) y que influyen las relaciones humanas y limitan el conjunto de la elección de los individuos. O sea, tanto las instituciones (leyes, cultura, hábitos, reglas de conducta, papel del estado) como la dinámica capitalista (tecnologías, motivación,...) contribuyen a determinar las distintas trayectorias del crecimiento, pudiendo generar una situación englobada en la teoría de la *path dependence*. (Martín-Palmero & González-Laxe, 2018). Tanto más, cuanto más definidas y garantizados fueron los derechos de propiedad mas eficientes las instituciones; y mas eficaces los sistemas de incentivos.

Se puede afirmar que el concepto de *path dependence* está condicionado por los comportamientos, conductas y valores que las generaciones adoptan en cada fase histórica, con lo que se sigue una trayectoria dependiente de lo acontecido y los cambios son lentos y difícilmente aceptados. En suma, tanto el manejo como la especialización desempeñan los aspectos claves de interpretación de la *path dependence*. Y las variables determinantes vendrían definidas por el dominio del tiempo y del espacio; por la introducción de nuevas técnicas; por la organización de la producción; y finalmente por la asimilación del aprendizaje y la experiencia histórica

De ahí la transcendencia de relacionar tres conceptos: política pesquera; sistemas de gestión y medidas de gestión, tal y como se explicita en el cuadro nº 1.

Cuadro nº 1. Interrelación de objetivos de políticas pesqueras, sistemas de gestión y medidas de gestión

Acciones	Objetivos	Niveles
Política pesquera	Definición de problemas; formulación de objetivos, alternativas y selección de soluciones.	Nivel sustantivo
Sistema de gestión	Definición de cuestiones técnicas y articulación de las estructuras institucionales y administrativas	Nivel estratégico
Medidas de gestión	Definición de cuestiones operativas e institucionales para el desarrollo de las actuaciones	Nivel táctico

Fuente: Elaboración propia.

2. RESULTADOS: TEORÍA DE LOS COMPORTAMIENTOS DEL PESCADOR

Los pescadores siguen, preferente y habitualmente, tres lógicas y conductas. La primera está definida por la maximización del beneficio. Esto es, buscan que la diferencia entre ingresos y costes sea máxima; o que, por lo menos, sea satisfactoria dentro de los umbrales de negocio o que las ratios obtenidos sean comparables con las expectativas y necesidades surgidas dentro del entorno social y territorial más próximo. Es decir, los pescadores estiman sus expectativas (ejercen previos cálculos de sus rendimientos) de ingresos y de gastos. Lo hacen asociados a los niveles de producción, incluyendo los factores vinculados a la incertidumbre y a la imprevisibilidad. Las variables claves de dichas situaciones vienen dadas por la relación costes/beneficios (*CPUE*); por los sistemas de remuneración *a la parte* (sistemas de pago a la tripulación en función de la cantidad desembarcada puesta a venta); por los lugares de pesca (determinados por la accesibilidad y la probabilidad de pesca); y por los aspectos socio-culturales (derivados del entorno, de las posibilidades de trabajo y del legado histórico familiar). No cabe duda que los pescadores mantienen alguna de las hipótesis del pasado, tales como la aversión al riesgo; las tradiciones o inercias, algunas de las cuales pueden ser consistentes con el objetivo de maximizar los beneficios; los comportamientos basados en normativas, reglamentaciones o acatamientos aceptados y asumidos sin llegar a dudar de los mismos; los modelos de elección y de disuasión admitidos de manera general; y los comportamientos individuales muy desarrollados y aceptados.

La segunda lógica está relacionada con las repercusiones derivadas de la crisis biológica. Esto es, del comportamiento de la distribución de las poblaciones de peces. Los pescadores buscan y piensan en "*comportamientos ideales*"; y, sobre ellos, actúan en función de sus habilidades y niveles de competitividad. De esta forma, sobresale la actitud individual más que el comportamiento de las flotas en su conjunto. Las variables claves de dichas actuaciones vienen dadas por la definición de espacios, de lugares y zonas de pesca, por un lado; y de los permisos de acceso a dichos emplazamientos, por el otro. Por último, los pescadores no actúan de manera uniforme, sino que cada uno de ellos dispone y utiliza informaciones diferentes, provenientes de sus experiencias y de sus legados históricos-familiares.

La tercera conducta está determinada por los enfoques sociales; esto es, por los derechos humanos y por los comportamientos familiares o territoriales. El primer aspecto viene suministrado por la conducta de los pescadores estrechamente relacionada con la dimensión de la flota. No son, por tanto, idénticos los comportamientos de la flota artesanal, la costera o de la industrial. Asimismo, el comportamiento del pescador está muy relacionado con las expectativas de las condiciones de bienestar, supervivencia, entorno, satisfacción laboral, y esperanza de vida. Más tarde, en función de la pertenencia geográfica y territorial, junto al rol del papel socio-cultural en el que se inscribe, los pescadores forman parte de una "*identidad particular*", como grupo complejo y dinámico, del que se derivan actuaciones singulares en lo que concierne a las relaciones, procesos y vínculos, ya sean muy estrechos entre sí y entre su entorno. De esta forma, conservan y refuerzan sus tradiciones, valores y percepciones presentes, tanto en sus comunidades pesqueras como en lo que concierne a sus vínculos familiares.

El desarrollo de dichas conductas supone tener en consideración aquellas críticas basadas por la utilización de datos agregados que limitan las interpretaciones, y que el comportamiento individual es el resultado de una combinación de factores y consideraciones que van más allá del principio de maximización de beneficio. Por eso, es preciso considerar la combinación de dos conceptos: habilidades y sabiduría. Ambas están desarrolladas por los pescadores a lo largo del tiempo; y sus actitudes son reflejos de la asignación del esfuerzo de pesca. En consecuencia, su comportamiento se basa en la incorporación del conocimiento local usando un proceso de participación captado en las convenciones aceptadas entre si y por el legado familiar. O sea, un concepto de “*mapa mental*”, que es el sumatorio del conocimiento individual + memoria histórica.

El comportamiento del pescador puede conducir a mantener un egoísmo individual (derivado de sus trayectorias y expectativas) y de un oportunismo temporal (que le garantiza su pervivencia). De ahí que el pescador busque, en primer término, que el recurso sea asegurado por medio de reglamentos dirigidos al conjunto de los utilizadores potenciales y que, posteriormente, los recursos puedan llegar a convertirse en bienes privados bajo la esperanza de que los propietarios de los mismos puedan gestionar dichos recursos de mejor manera. Y, en segundo lugar, el pescador se moviliza constantemente y se constituye en grupo de interés. De ahí la adopción de sus principios de rivalidad y de compromiso. Su inclusión en organizaciones comunitarias es permanente, aunque no siempre lo haga y permanezca en la misma, dada la variabilidad de criterios utilizados a lo largo de su vida laboral.

A estas claves les podemos sumar otros aspectos de orden subjetivo: a) satisfacción laboral: emoción y desafíos; b) caracterización personal: dificultades y actitudes; c) apego al trabajo familiar y estilo de vida; d) condiciones de subsistencia; e) relevancia de la economía local. Frente a ello está la resiliencia o la capacidad de afrontar los cambios impuestos o sobrevenidos en el sector.

¿Qué hemos observado hasta el momento?. Un registro de varias situaciones que revelan lo siguiente: a) una gran asimetría en la conducta de los pescadores; y b) una gran heterogeneidad y dinamismo en función de aspectos geográficos, socio-culturales y medio-ambientales. Por tanto, debemos desagregar la implicación de los distintos agentes en el proceso de gestión que determinan las capacidades de ordenación y de manejo; y, paralelamente, analizar el ámbito de la aceptación de las normas, derivadas de la asimilación o imposición de las mismas, atendiendo a los criterios individuales o de grupo asumidos en el entorno geográfico y sectorial.

La incorporación de la dimensión humana en el análisis de conducta nos permite explicar las motivaciones y su racionalidad. Algunos enfoques delimitan su asociación al bienestar de los pescadores (Weeratunge et al. 2013); otros a las estrategias de supervivencia (Busilacchi et al. 2013); y otros los relacionan con el estilo de vida (Reed et al. 2013). No hay duda que el sector pesquero es parte de la economía local y contribuye notablemente a la comunidad, revelando un sentido de dependencia geográfica que refuerza la identidad individual y comunitaria. Dichos valores y percepciones influyen en el comportamiento de los pescadores y han sido utilizados en el análisis de las comunidades pesqueras (Naranjo-Madrigal, 2017). Es lo que Berkes (1999) recalcó cuando incide en las habilidades, prácticas y saberes de los pescadores, por medio de estrategias de subsistencia asociadas a los entornos geográficos y de actuaciones sostenidas en el tiempo, como legados a través de generaciones sucesivas. Por eso, dicho conocimiento posee implicaciones en las decisiones que adoptan los pescadores en la asignación del esfuerzo de pesca.

En consecuencia, la suma de las ecuaciones relativas a la conducta del pescador sigue el siguiente orden: a) el agente productor se involucra al proceso de producción motivado, únicamente, por sus propio interés; b) a medida que aumenta el nivel de extracción pesquera, el ingreso del individuo aumenta; c) se asume que los rendimientos marginales de su esfuerzo pesquero son decrecientes; d) atendiendo a la rivalidad frente a otros productores sobre el recurso, en la medida que la extracción agregada aumenta, el beneficio disminuye; e) cada agente tienen una cantidad máxima de esfuerzo lo que le permite promover una función que exprese los rendimientos decrecientes de mano de obra; f) cada agente podrá extraer hasta un nivel de rendimientos marginales positivos. Si supera el nivel del máximo rendimiento sostenible (MSY), se incrementará el rendimiento marginal negativo; g) la función de optimización vendría dada por los ingresos menos los costes que asume el agente por causa de las externalidades impuestas por la extracción agregada de los demás agentes; h) dado que admitimos que todos los agentes comparten tecnologías y dotación de medios similares, habría que tener en consideración el número de usuarios y la lógica que utiliza cada uno de ellos de cara a maximizar sus beneficios privados.

3. DISCUSIÓN. EL MODELO CONCEPTUAL DE MANEJO ECONÓMICO DE LA PESCA ARTESANAL Y COSTERA EN EL MARCO EUROPEO

La pesca es una de las actividades económicas más antiguas de la humanidad. Fue predominantemente artesanal y su producción estaba siendo orientada, fundamentalmente, para atender al mercado interno. Los desarrollos tecnológicos, las políticas de incentivos y las expediciones hacia nuevas zonas de pesca impulsaron una pesquería industrial, preferentemente orientada hacia el mercado exterior.

El decrecimiento de la pesca de captura y los cambios en los modelos productivos están relacionados con la sobrepesca de algunas especies. Tanto la escasa efectividad de reglamentaciones aplicadas a la gestión; la carencia de garantías en los mecanismos de reposición de los recursos pesqueros, y la laxitud a la hora de implementar controles y limitaciones de pesca, coadyuvaron a una dinámica de incertidumbre.

Las últimas dinámicas han ido convirtiendo al pescador artesanal en la primera víctima de una explotación no racional, en la medida que la preservación del binomio medioambiente /ecosistema no llegó a constituir la condición básica de su comportamiento. De ahí el gran interés del sector pesquero tradicional en insistir en las campañas a favor de la pesca y en favor de los pescadores. Sin embargo, en la Unión Europea el debate se ha centrado más en los posicionamientos a favor de los pescadores, en tanto que en otros países se apostó a favor de la conservación de los peces. Frente a este concepto, los recursos pesqueros han sido el foco de atención de quienes explotan, comercializan e investigan. Todos se han preocupado por los niveles de explotación, al ser un recurso natural renovable. Su regulación se convierte en uno de los grandes desafíos de la ciencia económica. Los recursos pesqueros estaban conceptuados como bienes de propiedad, de uso común, y con acceso libre, pero que al ser capturados por un pescador se altera la cantidad disponible para los demás. Se subrayan dos rasgos: acceso no controlado y situación competitiva. Bajo este análisis, la pesca extractiva, caso de no ser gestionada racionalmente puede conducir a una sobrepesca (situación derivada de cuando se captura por encima del máximo rendimiento biológico sostenible) lo que provocaría un agotamiento natural del recurso.

Bajo este análisis, la denominada pesca artesanal -la más numerosa (50 millones de pescadores, equivalentes al 90% de los pescadores del mundo) y con mayor incidencia en las comunidades ribereñas- supone un medio de vida para 200 millones de personas, representando un relevante marco de análisis para acotar su comportamiento diferencial. A nivel europeo, a pesar de los intentos por consensuar una definición precisa, la pesca artesanal se considera en función del criterio de eslora de las embarcaciones (Reglamento CE.1198/2006). Resulta pertinente, en consecuencia, subrayar la selección de dos parámetros que la definen. De una parte, la pesca artesanal engloba realidades poliédricas e interdependientes que condicionan la viabilidad de las flotas, incluyendo aquellas condiciones de vulnerabilidad y de inseguridad. De otra parte, el marco operativo de los pescadores artesanales es complejo y trasciende la mera maximización de la producción, reivindicando la resiliencia de las comunidades ribereñas ante la falta de alternativas laborales.

La literatura científica nos proporciona, asimismo, una serie de atributos de la pesca artesanal. Se incluyen 10 atributos básicos y diferenciales: a) en función del área y duración de la operación extractiva; b) en torno a la estrategia productiva; c) su apuesta por específicas estrategias comerciales; d) base sustantiva de modelos sociales y culturales; e) baja utilización de la tecnología; f) amplia flexibilidad en la gestión; g) diferentes grados de resiliencia; h) elevada apuesta por la sostenibilidad; i) nivel de influencia mediano; j) alto grado de conocimiento y habilidades. Como afirma García-Allut (2003) su supervivencia en el tiempo se debe a su capacidad adaptativa a contextos económicos, sociales e ideológicos diferentes.

Por eso, la pesca artesanal afronta varios impactos relevantes:

a) en primer término, sufre la influencia de la lógica del mercado; tanto en los que se refiere al periodo de capturas, de rentas, etc. La inserción en la economía de mercado le obliga a modificar la orientación de sus actividades, incorporando como objetivos el lucro y las ganancias, cuando antaño prevalecía el carácter de subsistencia o de satisfacción de necesidades básicas;

b) en segundo lugar, pierde el control sobre el uso de los recursos pesqueros, dados los intensos procesos de extensificación pesquera, de dispersión espacial de las capturas, de la propia desorganización de la comunidad pesquera; dinámicas que afectan al control efectivo del número de pescadores.

c) el tercer aspecto hace mención al mayor esfuerzo de pesca efectuado tanto por la pesca artesanal como por la pesca industrial, que podría provocar, en un plazo inmediato, una disminución del volumen de producción. En dichos casos, se aprecia una mayor dependencia de la pesca artesanal respecto de los compradores/ mercados.

d) en cuarto lugar, dado el carácter perecedero de los recursos pesqueros se exige una rápida comercialización de cara a no perder las cualidades organolépticas del pescado, Ello evita los estocages, a diferencia de otros bienes de propiedad común o industriales.

e) el quinto apartado hace referencia a su tratamiento en la Política Pesquera Comunitaria. Esta última ha privilegiado a la pesca industrial sobre la pesca artesanal. No solamente en lo que concierne a los programas operativos, sino en lo que atañe a la producción, a los incentivos a la industria, a la comercialización y a la distribución.

La dinámica de las actividades pesqueras se esfuerza e pone en evidencias las diferentes ventajas diferenciales en el contexto de una mayor competitividad y de lucha por la apropiación y uso de las zonas territoriales. Se busca el equilibrio conciliador entre performance e incertidumbre, tanto productiva como comercial. Habida cuenta de las importantes mutaciones ya sean a escala mundial, ya nacional, el interés de la actividad pesquera consiste en postular rendimientos crecientes de escala a partir del modelo clásico:

estandarización del modo de producción; crecimiento de la demanda, descenso de los costes de producción. Ello ha conducido a movilizar nuevas tecnologías, a mejorar las condiciones sanitarias, a considerar más creíble el propio ejercicio de extracción en lo tocante a la hipotética combinación de objetivo alrededor del binomio conservación/explotación de los recursos.

No hay duda que la pesca artesanal es una actividad consumidora de espacios. Por tanto, entra en disputa con otros usos del mismo (disponibilidad para otros productores y usos recreativos y residenciales). En este sentido, las posturas de los pescadores pueden conducir a una diversidad de compromisos institucionales y estratégicos entre las diferentes lógicas complementarias y por las apuestas del presente: racionalidad individual/colectiva; determinación del uso/preservación de los recursos; apuesta por lógicas mercantil/subsistencia. No es extraño, por lo tanto, que muchos compromisos de los pescadores reposen bajo un conjunto de instituciones formales e informales; que sus prácticas se ajusten a un complemento de normas y de reglas; y que sus objetivos se dirijan hacia la obtención de una performance más exitosa (productividad) o hacia una tendencia más conservacionista o de preservación.

Diferenciamos, en consecuencia, tres lógicas: a) la lógica productivista, caracterizada por la intensificación de su sistema de producción; b) la lógica tradicional, aquella que reposa en la capacidad de adaptación al medio; y c) la lógica adaptativa, marcada por la diversidad de repuestas a los factores de desestabilización. Tal división no implica un reparto igualatorio de los actores en el seno de dichas lógicas; sino que la diversidad de los mismos responde a los disímiles contextos de incertidumbre en los que se desarrollan las actividades productivas y las inserciones/posicionamientos de cada actividad en sus ámbitos de desarrollo. En suma, varios modelos productivos relativamente antagónicos que oscilan desde los modelos tradicionales hasta el modelo industrial.

4. PLANTEAMIENTOS DESDE EL SECTOR PESQUERO GALLEGO

Galicia es una comunidad altamente dependiente de la pesca. Resalta por su importancia económica en todos los eslabones de la cadena de valor, ya sea en el ámbito de la extracción, transformación, industrialización y comercialización, con una contribución en torno al 2% del PIB regional. Posee una elevada relevancia social y cultural en la medida que las comunidades pesqueras que pueblan el litoral gallego contribuyen a fijar la población, atesorando creencias y valores que definen una cultura identitaria transmitida como legado de generación en generación. Asimismo, está dotado de una instancia política propia (Gobierno Regional) que despliega una actividad normativa singular.

Cuadro nº 2. El sector pesquero gallego en cifras, (2015)

Categoría	indicador	Galicia	% España	% UE
Flota pesquera	Buques	4.438	46,4	5,2
	Tonelaje	183.552	51,8	11,3
	Potencia	366.356	44,9	5,7
Producción	Descargas (Tns)	180.463	20,0	3,5
	Descargas (millones €)	543	27,8	7,8
	Acuicultura (Tns)	275.043	82,1	21,7
	Acuicultura (millones €)	187	38,2	5,6
Industria procesado	Producción (millones €)	2.820	60,0	14,7
Consumo	Consumo per capita (kg/habitante)	32		
Empleo	UTA	33.222	46,1	9,7
Comercio pesquero	Importaciones (Tns)	681.135	43,8	13,6
	Importaciones (millones €)	2.052	35,8	9,5
	Exportaciones (Tns.)	567.987	55,6	35,7
	Exportaciones (millones €)	1.709	52,7	43,4

Fuente: Álvarez Ballesteros, M. (2018). Tesis doctoral. Universidade de Vigo.

Cuadro nº 3. Relevancia de la pesca artesanal de Galicia (enero 2018)

Categoría	Flota artesanal	Flota Galicia	% total Galicia
-----------	-----------------	---------------	-----------------

Flota pesquera	Buques	3.887	4.367	89,08
	Tonelaje (TRB)	9.290	79.664	11,66
	Potencia (KW)	82.045	251.178	32,66
Embarcación tipo	Eslora media	6,33		
	Tonelaje medio	2,39	18,24	
	Potencia media	21,10	57,51	
Empleo	Numero tripulantes	6.558	11.377	57,64
	Número tripulantes medio	1,68	2,60	
Facturación (miles €)		121.862	889.254	13,70
Euros por ocupado		18.582	78.162	23,77

Fuente: Instituto Galego de Estatística, Plataforma Tecnológica; OCUPESCA.

Escudriñando la problemática de la actividad pesquera de Galicia destacamos: a) la relevancia estratégica, ya sea desde la perspectiva económica, biológica y social, que reflejan una heterogeneidad de la actividad, una pluralidad de marcos normativos, múltiples sistemas de gestión, diferentes capacidades en dar respuestas a través de estrategias de cooperación, y una activa intervención de la acción pública en lo tocante a la gestión de los recursos; b) una amplia biodiversidad de los ecosistemas costeros, que favorecen el desarrollo de diversas actividades extractivas; c) la existencia de pesquerías multi-específicas, explotadas por cerca de 4.000 embarcaciones que alternan artes y modalidades de pesca en función de las condiciones de acceso y períodos de pesca, resaltando la atonicidad de la actividad explicada por la extensión geográfica de las áreas de pesca; d) las estrategias de pesca combinan tanto la diversificación como la flexibilidad, ya que alternan diferentes regulaciones en función de la época del año, concentrando el esfuerzo en las pesquerías más rentables; conformando, asimismo, un nicho económico en el que se subraya un contexto de baja formación y limitada elección de alternativas laborales; e) posee una notoria sensibilidad y social, que se refleja en los variados niveles de conflicto y de amplia repercusión mediática. En suma, la complejidad del marco de funcionamiento de la pesquería artesanal de Galicia se traduce en una mayor dificultad en el ámbito de las regulaciones (Álvarez-Ballesteros, 2018).

La pesca artesanal en Galicia se rige por una gestión centralizada, prevaleciendo una perspectiva de “*mando y control*”, a pesar de los mecanismos formales de carácter consultivo. Se enfatiza en la implementación de medidas técnicas y en normas cada vez más detalladas y complejas, cuya racionalidad ha sido y continúa siendo ampliamente cuestionada.

La actividad pesquera se desarrolla en un entorno competitivo, con elevados usuarios del recurso, en donde predomina la alternancia de artes que afectan al comportamiento de los pescadores y favorece la adaptabilidad y flexibilidad de la pesca. En suma, las evidencias más nítidas vienen dadas por los siguientes ejes:

- una alta volatilidad de las decisiones públicas. Esto es, alternan aquellos esfuerzos de racionalización con aquellas condiciones de flexibilidad y de pactismo. Sin embargo, se constatan excepcionalidades, situaciones irregulares y comportamientos oportunistas. Se presencia un doble fenómeno: incumplimientos y pérdidas de credibilidad con ineficiencias en la implementación de políticas;
- unas dinámicas de confrontación y de consenso. El sector es percibido por las administraciones públicas como una *actividad inmadura* para adoptar decisiones de gestión y con mínima capacidad de auto-organización. De ahí la proliferación de reglas informales y una amplia proliferación de “*tiempos de diálogo*”, que recogen ciclos cortos de auge y caída en la producción y en la generación de ingresos;
- una minimización del conflicto, mediante la búsqueda del compromiso entre políticas de conservación del recurso y la propia distribución de los impactos de las políticas regulacionistas. O sea, predominan la ordenación del uso y se prioriza la distribución de los ingresos entre más pescadores;
- la resistencia al cambio, es mucho más intensa en la pesca artesanal. Se movilizan más por las expectativas que por el propio beneficio.

El sistema de valores y de creencias del pescador artesanal de Galicia identifica una clara dualidad en su discurso de la percepción. Frente a la concepción del “mar es de todos”, se pasa a la definición de “el mar es nuestro”. Esto es, de una noción de mar abierto, libre, de todos, no excluyente y no necesitado de regulación; se transita a otra concepción teórica que está definida por una filosofía de explotación individualista, con afán productivista y sin propósito conservacionista o de eficiencia productiva (García-Allut, 2003). Por eso, la cronología de la política pesquera de Galicia arroja diferentes planteamientos básicos que oscilan desde los ejes top-down/bottom-up de las políticas regulacionistas; la continua

negociación/reivindicación entre los interlocutores; el cumplimiento de normas/laxitud de los productores en su funcionamiento; un marco estratégico/ actuación táctica por parte de los decisores públicos.

No es de extrañar, por lo tanto, una secuencia adelante/atrás en lo referente a la política pesquera, a sus medidas y a su implementación. Oscila desde un fuerte e intenso intervencionismo sin diálogo hasta un exagerado pactismo evitando la confrontación y despreocupándose de la eficiencia productiva. Un ejemplo de tales decisiones lo apuntamos en el cuadro número 4, en donde se reflejan las principales orientaciones en materia de política pesquera del Gobierno de Galicia.

Cuadro nº 4. Cronología de la política pesquera en Galicia

Etapa	Características	Orientación
1985-1990	Ordenación	Adaptación y respuesta al proceso de integración europea. Desarrollo competencial de la Administración Autonómica. Regulación de los aspectos básicos de la pesquería Limitación del acceso abierto y medidas técnicas
1990-1993	Racionalización	Profesionalización y criterios de eficiencia económica. Aplicación principios de gestión pesquera Apreciación de la dimensión social y compensación económica a los pescadores Conflicto y confrontación
1994-2000	Conciliación	Dimensión social percibida como objetivo de la política. Amplia flexibilidad en aplicación de normas Aplicación de una gestión posible de los recursos Pérdida de credibilidad institucional
2001-2005	Cambio de orientación	Corrección de la etapa anterior. Rigor en la aplicación de normas Conflicto y ausencia de credibilidad. Dimensión social integrada como objetivo
2005-2009	Reo-orientación	Gestión racional del sector. Innovación en la co-gestión. Modificación del status quo: cambios en las medidas de gestión, en la normativa, en la participación. Pluralidad de agentes, actores e interlocutores productivos.
2009-2017	Mediación	Aplicación de una gestión posible del sector. Adaptación de las normas a la realidad de las prácticas pesqueras. Recuperación del status quo respecto a medidas de gestión. Interlocutores básicos y desarrollo de procesos participativos. Dimensión social como garante de la sostenibilidad del recurso.

Fuente: Adaptación y elaboración personal sobre la base de Álvarez-Ballesteros, M. (2018).

En suma, el sector pesquero artesanal es heterogéneo y fragmentado, que hace frente a las externalidades tecnológicas (derivadas de las interferencias entre artes de pesca en el ejercicio extractivo) y a las asignaciones de las condiciones de pesca entre las flotas artesanales y/o entre las flotas industriales (delimitadas en determinadas áreas de pesca). Tales externalidades acarrear situaciones de conflictos y de prácticas irregulares e ilícitas (como las manifestaciones de sobrepesca, sobrecapacidad y furtivismo). Solo un conjunto de normas sociales aceptadas permite reforzar y retroalimentar conductas racionales y eficientes. El ingente esfuerzo normativo llevado a cabo, todavía, no conseguido alcanzar una situación de máximo rendimiento biológico, económico y social; aun cuando los avances hacia dicha dirección han sido notables desde una mayor asunción de la problemática existente. Expresado en otros términos se ha reducido la brecha entre la realidad existente y la legislación vigente.

El mayor nivel de concienciación de los pescadores artesanales reveló un cambio de actitud. Al principio, se afirmaba que tanto la gestión como la ordenación pesquera se basaba en la teoría de los bienes comunes, subrayando, por tanto, la no-exclusión y la rivalidad. Eran conscientes, en consecuencia, de que dichos desarrollos podrían conducir al agotamiento de los recursos colectivos (siguiendo las tesis de Hardin). Los pescadores admitían que dichos bienes comunes se convertirían, a lo largo del tiempo, en bienes públicos; y, siguiendo una lógica propia de los pescadores, el Estado tendría que asegurar la gestión, la rentabilidad y las expectativas de futuro mediante la aprobación de normas que iría adecuando en función de la situación de los propios recursos pesqueros. Por eso, la puesta en práctica de la Política Pesquera Comunitaria (PPC) tuvo un primer efecto des-estabilizador; tanto en lo que concierne a la dimensión institucional como

en lo que afecta a la dimensión cultural, entendida ésa última como profesión. Dicha interpretación fue factible en la medida que la PPC provocó una notable modificación de las argumentaciones clásicas y tradicionales de la gestión pesquera al imponer una nueva *doxa*. Esto es, se promulgaron nuevos dispositivos (movilizados por ciertos grupos) contra las prácticas de otros actores.

Los elementos necesarios para nuestra consideración fueron tres: a) la determinación de los nuevos criterios de acceso a las zonas de pesca; b) la definición de nuevas competencias relativas a las reglas de gestión de los espacios marinos; y c) la nueva definición de instrumentos de gobernanza que formalizan las actuales reglas de gestión. Es decir, la PPC rompe la tradición, las normas y las reglas consuetudinarias. No obstante, se admitieron tres aspectos: a) la pluralidad y peculiaridad específica de la pesca; b) la ausencia de derechos de propiedad y la ausencia de fronteras marítimas; y c) se facilitaron unas políticas voluntaristas de modernización, que se derivaron hacia una aportación de ayudas y subvenciones para las incorporaciones tecnológicas, para el incremento del tamaño y la potencia de las embarcaciones, para la mejora de sistemas de navegación y detección, para la mejora del tratamiento y la conservación de los recursos, etc.

Las respuestas de los pescadores gallegos ante las directrices de la PPC no fueron, en principio, técnicas, sino más bien de orden conceptual. Las actuaciones de los pescadores gallegos siguieron una secuencia lógica. En una primera fase, estuvieron fuertemente asociados a una comunidad local costera; mantuvieron una férrea defensa de las normas tradicionales en el campo cultural y social; se movilizaron de manera conjunta en defensa de los intereses económicos. A continuación, las manifestaciones se centraron en la distinción de planteamientos heterogéneos en función de los diferentes intereses de las flotas. Dichos posicionamientos generaron muchos conflictos tanto entre flotas como entre zonas; así como la complejidad de dar a conocer cual era la pesquería más relevante, estratégica y trascendental. En una tercera fase, se vislumbró una carencia de solidaridad intersectorial, en la medida que se consagra el principio del “*race to fish*”. Sin embargo, siempre estuvo asumido el concepto elemental: el recurso es un bien a defender,

Desde la Comisión Europea la perspectiva era otra. Buscaban entender que las decisiones que adoptan los pescadores tenían que seguir una pauta racional, como si fuera un modelo teórico. Es decir, se sostenía que la conducta del pescador seguía una trayectoria que buscaba lograr una mayor utilidad, una optimización de la producción, la obtención de elevados ingresos, de minimizar costes, etc. Por eso, se recurrió a las distintas concreciones derivadas de la bio-economía, sobre todo, de los modelos definidos por Gordon (1954) que proponía comportamientos y conductas homogéneas.

Sin embargo, la práctica de los pescadores es más parecida a aquellos modelos de decisión que incorporan tanto cuestiones tácticas (las derivadas de los movimientos y desplazamientos a determinadas zonas de pesca, siguiendo al recurso) como cuestiones estratégicas (las derivadas de los cambios de especie objetivo). De ahí que Bené & Tewfik (2001) argumentaran que los pescadores incorporan en su toma de decisiones aspectos concernientes a captar incentivos monetarios y no monetarios; o, como apunta Van Putten et al. (2012), los pescadores se fijan más a la hora de adoptar una decisión en los costes económicos per se, que de los demás aspectos.

5. CONCLUSIONES

Los pescadores se configuran como actores sociales. Es una condición indispensable para el proceso de defensa de sus intereses y de reacción ante la definición de una política común de pesca. Dichos actores se movilizan constantemente, mostrando una continuada defensa de sus intereses; asociándose en comunidades territoriales; constituyendo “polos” sociales, culturales y económicos alrededor del recurso. A pesar de su heterogeneidad sectorial y territorial, sostienen la defensa de sus intereses comunes bien en su conjunto, bien en función de sus especificidades (como las derivadas de las artes de pesca que utilizan, de los lugares de pesca, o de los periodos de tiempo, por ejemplo).

Los pescadores mantienen amplios márgenes de solidaridad. No solamente aceptan normas comunes, sino que incorporan tradiciones. Admiten, asimismo, la doble incertidumbre, la proveniente de los volúmenes de captura esperables y la de la valorización de los productos, es decir, los precios. De ahí que la estrategia está fundamentada en proteger tanto a “sus recursos” (mediante el establecimiento de códigos de buenas prácticas) y de “sus rivales” (en lo que respecta a las capturas-oferta complementaria como de las valorizaciones-diferenciación recursos).

Los pescadores discrepan a menudo de las opiniones científicas provenientes de los organismos oficiales. Son constantes las disputas entre pescadores y estudiosos. Los pescadores argumentan que “los recursos siempre vuelven” o “los recursos están allí...”. Los pescadores se basan en la denominada “memoria colectiva” para subrayar el hecho de la abundancia y la inestabilidad/ciclos a lo largo de la historia. Por eso, la negativa a admitir recortes/ajustes/reconversiones.

Los pescadores están vinculados a las comunidades costeras. Las reglas y las normas son más fáciles de admitir y de aplicar cuando un territorio está bien identificado. Los controles serán más fáciles y eficaces.

Los pescadores utilizan las relaciones de proximidad como palanca de su potencialidad y como defensa de sus intereses.

Los pescadores relacionan de manera directa dos planteamientos de futuro. El primero, vinculan el territorio con los recursos, dando lugar a la constitución de "micro-espacios" socioeconómicos determinados. Por ello, dichas asimilaciones dan pie a perfilar las dos nuevas apuestas recientes: la co-gestión y la creación de las áreas marinas protegidas. Ambas son respuesta a la necesidad de constituir y mantener un sector básico en la comunidad costera y sostener un modelo económico local. La segunda hace referencia a la aceptabilidad de las medidas impuestas. Es preciso, por tanto, evaluar su coherencia, los efectos de los procesos de desestructuración que algunas medidas ocasionan en las actividades tradicionales, las consecuencias derivadas de la mayor rivalidad entre puertos; o los impactos provenientes de la creación y configuración de nuevas realidades particulares. Este análisis requiere de más tiempo para su análisis y, además, está relacionado con las transformaciones de la sociedad actual.

En suma, los pescadores tienen varias alternativas. Cada una de ellas está descrita por un conjunto de datos dentro de los cuales se encuentra la opción de que el stock sea pescado y ofrecido a una demanda. Su función de producción puede ser descompuesta por una parte determinista (observables) y otra parte estructurante (no observable). La primera queda especificada como combinación de variables explicativas que determinan la actividad de elección y las características socio-económicas de los pescadores. Supone selección y capturas heterogéneas. Las segundas, determinan una matriz en la que predominan parámetros aleatorios.

Los modelos de conducta siguen cuatro ejes. El primero, es que la utilidad total deriva de tomar unas decisiones en lo tocante a las capturas, asegurando no atentar contra la sostenibilidad del recurso de uso común. El segundo, es que la utilidad privada depende de los costes asociados a la ilegalidad y a los costes asociados a la actividad propiamente dicha: el regulador envía, constantemente, señales al pescador ilegal para frenar su actividad. El tercero eje hace referencia a que los modelos de comportamiento de la pesca sostenible tienen en cuenta factores de influencias social, territorial y de legitimidad. La utilidad social depende de lo que el individuo espera que haga su grupo de referencia. Y, finalmente, el cuarto planteamiento directivo es que se asiste a un juego no cooperativo de información, casi siempre, incompleta.

Desde una perspectiva más económica, el productor se debate entre varios tipos de decisiones. Nos referimos a tres dilemas: a) el dilema recurso/producto (es decir, proceder a determinar la cantidad más rentable del recurso a extraer y distribuir); b) el dilema recurso/recurso (o sea, analizar la combinación más rentable entre los recursos producidos o extraídos); y c) el dilema producto/producto (esto es, la mezcla de especies más rentables a producir con una determinada posibilidad de recursos). Por eso, siempre se habla desde una perspectiva biológica, económica, social e institucional, generando con ello una triangulación de las dificultades, según se apueste por una u otra variable

REFERENCIAS

- ÁLVAREZ- BALLESTEROS, M. (2018). *Gobernanza policéntrica en sistemas socio-ecológicos complejos: la gestión de la pesquería del pulpo común en Galicia*. Tesis Doctoral. Universidade de Vigo
- BÉNÉ, C., TEWFIK, A. (2001). Fishing effort allocation and fishermen's decision making process in a multi-species small-scale fishery: analysis of the conch and lobster fishery in Turks and Caicos Islands. *Hum. Ecol.* 29, 157-186.
- BERKES, F. (1999). *Sacred ecology. Traditional ecological knowledge and resource management*. Philadelphia. Taylor & Francis.
- BROMLEY, D.W. (1991). *Environment and Economy: property rights and public policy*. Oxford. Blackwell.
- BROMLEY, D.W. (1992). The commons property and common property regimes. In Bromley (Ed.). *Making the commons work: theory, practice, policy*. Institute of Contemporary Studies. San Francisco. 3-25.
- BUSILACCHI, S., RUSS, G. WILLIAN, A. SUTTON, S., BEGG, G. (2013). The role of subsistence fishing in the hybrid economy of an indigenous community. *Marine Policy* 37, 183-191.
- DAVID, P.A. (1998). *Path dependence, its critics and the quest for "historical economics*. Oxford Stanford University. Working Paper.
- GARCIA ALLUT, A. (2003). La pesca artesanal gallega y el problema de la comercialización: Lonxanet.com como una alternativa?. La Pesca y el Mar. Cambio sociocultural y económico. *Zainak. Cuadernos de Antropología*, 26. 17-32.
- GONZÁLEZ-LAXE, F. (2010). Dysfunctions in Common Fishing Regulations. *Marine Policy*, 34(1). 182-188.
- GORDON, H.S. (1954). The economic Theory of a Common Property Resource: The Fishery. *Journal of Political Economy*. 62. 124-142.
- GRAY, T., HATCHARD, J. (2003). The 2002 Reform of the Common Fisheries Policy's System of governance. Rethoric or Reality?. *Marine Policy*. 27. 545-554.
- HARDIN, G. (1968). The tragedy of Commons. *Science*. 162. 1243-1248.
- KHALILIAN, S., FROESE, R., PROELSS, A., REQUATE, T. (2010). Designed for failure: a critique of the Common Fisheries Policy of the EU. *Marine Policy*. 34. 1138-1182.

- LEQUESNE, C. (2001). *L'Europe Bleue. A quoi sert une Politique Communautaire de la Pêche?*. Paris. Presses de Sciences Po.
- MCCAY, B., ACHESON, J.M. (1987). Human Ecology of the Commons, in McCay & Acheson (Eds). *The Question of Commons. The culture and ecology of communal resources*. University of Arizona Press. Tucson. 1-34.
- MARTIN-PALMERO, F., GONZÁLEZ-LAXE, F. (2018). Path dependence and European Fisheries Management. *European Journal of Government and Economic*. 2. 138-153.
- NARANJO-MADRIGAL, H. (2017). Theories and models used in analyzing fishermen behaviour: insights on fisheries management processes. *Revista Marina Costera*. 9(1), 61-84.
- NORTH, D.C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge. Cambridge University Press.
- NORTH, D. C. (2005). *Understanding the process of Economic Change*. Princeton. Princeton University Press.
- ÖSTERBLOM, H., SISSEWINE, M., SYMES, D., KODIN, M., DAW, T., FOLKE, C. (2011). Incentives, social-ecological feedbacks and European Fisheries, *Marine Policy*. 35. 568-574.
- OSTROM, E. (1990). *Governing the commons: the evolution of institutions for collective action*. New York. Cambridge University Press.
- OSTROM, E. ET AL. (2004). *The Drama of the Commons*. New York. Cambridge University Press.
- Redd, M., Courtney, P., Urquhart, J., Ross, N. (2013). Beyond fish as commodities: understanding the social-cultural role of inshore fisheries in England. *Marine Policy*, 37, 62-68.
- SCHAEFFER, M.B. (1954). Some aspects of the dynamics of populations. *Bulletin of the International American Tropical Tuna Commission*. 1. 26-56.
- SCHAEFFER, M.B. (1957). Some considerations of population dynamics and economics in relation to the management of marine fishes. *Journal of the Fisheries Research Board of Canada*. 14. 669-681.
- SEIJO, J. C., DEFEO, O., SALAS, S. (1997). *Bio-economía. Teoría, modelización y manejo*. Roma. FAO.
- VAN PUTTEN, I., KUMALA, S., THÉBAUD, O., DOWLING, N., HAMON, K. G., HUTTON, T., PASCOE, S. (2012). Theories and behavioural drivers underlying fleet dynamics models. *Fish and Fisheries*, 13. 216-235.
- WEERATUNGE, N., BÉNÉ, C., SIRIWARDANE, R., CHARLES, A., JOHNSON, D. ALLISON, E. NAYAK, P, BADJECK, M. (2013). Small-scale fisheries through the wellbeing lens. *Fish and Fisheries*. 15(2). 255-279.

HOW MUCH DOES DRUG AND ALCOHOL HOSPITAL TREATMENT COST IN EUROPE? WHAT CAUSES SPENDING?

BRUNO CASAL RODRÍGUEZ

Facultade de Economía e Empresa/Universidade da Coruña

CLÁUDIA COSTA STORTI

European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)

DAVID MORGAN

OECD

Abstract

In 2016, more than 1.5 million people across the European Union (28), Turkey and Norway received medical treatment for illicit drug use. In a quarter of these countries, more than 30% of patients were treated in hospitals, although the role of hospitals in providing drug treatment varies markedly across countries. How much is spent on treating these patients is not known. Despite the fact that, among other ends, knowing how much is spent supports cost-effectiveness and policy analysis. Expenditure estimates allow a better allocation of scarce resources, serving service providers, health policy makers and tax payers. However, expenditure data have been frequently unavailable.

This study aims, first, to develop a method to estimate expenditure on hospital treatment of illicit drug and alcohol use, in Europe; second, to estimate and compare estimates; third, to investigate the factors that explain recent expenditure trends and; last but not least, to discuss their impact on policy.

The study uses Eurostat data, complying with the System of Health Accounts and covering the European Union (28) and Norway. Data are grouped by 'Mental and Behavioral Disorders' and, more specifically, by disorders caused by the use of alcohol and by the use of other psychoactive substances. The study uses 'attributable fractions' to estimate expenditure. Fractions disentangle drug and alcohol expenditure out of total hospital expenditure, based on activity data. Additionally, the study applies a panel data approach to combine multi-country data with time series, and to explain expenditure determinants and differences between countries.

This study estimates that, in 2015, EUR 5.9 billion were spent to treat alcohol abuse in hospitals, while EUR 3.3 billion were spent on drug treatment, in a set of 24 European countries with data available. In 2015, spending on alcohol treatment exceeded spending on drug treatment in these countries by EUR 2.6 billion. This difference remained stable over the period 2013-2015, varying within the range EUR 2.6 to EUR 2.8 billion. In per capita terms, EUR 18.6 and EUR 14.4 were spent on alcohol and drug diagnosis, respectively. Econometric model results suggest that cross-country differences are explained by the seriousness of the epidemics faced by each country, the structures of health systems (more public versus private and available alternatives to hospital treatments), and by the level of domestic product of each country.

1. INTRODUCTION

In 2016, more than 1.5 million people were estimated to have received medical treatment for illicit drug use in the European Union (28), plus Turkey and Norway. However, the role of hospitals in the provision of treatment to illicit drug users varies markedly. According to the European Centre for Drugs and Drug Addiction (EMCDDA), the proportion of patients treated in hospitals out of the total of patients treated for illicit drug use varied from more than half (51%) in Luxembourg to 0% in the neighboring country, the Netherlands. Overall, data for 2015 show that in fourth quarter of these countries at least 30% of the patients treated for illicit drug use received care in hospitals. However, for the whole of European Union, Norway and Turkey, only 5% of these patients were treated in hospitals (EMCDDA, 2018a).

Hospitals also provide treatment for alcohol abuse. The number of patients treated for problems related to alcohol use and the associated length of stay in hospitals suggest that treatment for alcohol-related problems is also a significant practice. The impact on spending deserves also full attention. For instance, in 2011, in European countries with data available, the number of patients discharged weighted by the length of their stay in hospitals was between twice to more five times higher in the case of alcohol than in the case of drug use treatment (OECD, 2018).

The impact of hospital treatment on the total cost of treating alcohol and illicit drugs (substance use) disorders is probably high because treatment in hospitals is predominantly inpatient treatment, which is relatively more expensive than outpatient treatment. According to EMCDDA (2018), outpatient treatment is more frequently provided in other settings, such as specialized treatment centers or low-threshold agencies.

OECD figures comply with the EMCDDA definition of treatment provided to illicit drug users in hospitals. As EMCDDA (2017a) states, the number of annual patients in hospitals concerns the number of people whose treatment took place in hospital-based residential treatment units (inpatient, including psychiatric hospital, inpatient medical detoxification unit) as specialized medical, psychiatric and/psychosocial treatment services that address drug dependency (often psychiatric hospitals or psychiatric wards in general hospitals).

In 2015, across 26 European countries, a total of 240 thousand hospital discharges were registered for mental and behavioral disorders due to psychoactive substance use and 722 thousand hospital discharges due to use of alcohol. In terms of bed days, these discharges generated a total of 3.9 and 9.2 million bed days (comprising 0.6% and 1.5% of all causes) (Eurostat, 2018)¹. These data comply with the classification of first diagnostics, based on the International Shortlist for Hospital Morbidity Tabulation (ISHMT) and ICD-10 codes. This classification system contains a chapter devoted to Mental and Behavioral Disorders (F00-F99), which encompasses the F10 - F19 codes. These codes cover 'mental and behavioral disorders due to the use of alcohol' (F10) and 'mental and behavioral disorders due to the use of other psychoactive substances' (F11-F19).

¹ Bulgaria; Czech Republic; Denmark; Germany; Ireland; Spain; France; Croatia; Italy; Cyprus; Lithuania; Hungary; Malta; Poland; Portugal; Romania; Slovenia; Slovakia; Finland; United Kingdom; Iceland; Liechtenstein; Norway; Switzerland; Serbia; and Turkey.

The need to implement cost-effective practices in drug policy is addressed both in the EU drugs strategy (2013-2020) and the EU Actions plan on drugs (2017-2020). Also, the EMCDDA stresses that the need to develop means of estimating public expenditure reflects the importance of making data and models available, as a first step in the economic evaluation of policies and interventions. EMCDDA stresses that limited data and/or insufficient comprehension of the financing of drug treatment inevitably hinders the efficient allocation of resources (EMCCDA, 2017).

In this context, comparable data on expenditure by disease is deemed important both at national and international level. Recently, several European countries have faced austerity in the health sector (EMCCDA, 2014). In this economic context, whereby limited resources can be an active constraint, it becomes even more relevant for health providers to release accurate information about their costs, in order to allow cost-effectiveness analysis, comparing types of treatments available and health providers. This exercise improves budget allocation and planning, improves decision making processes and resource allocation; as well as permitting the monitoring of changes in medical practice. Moreover, comparing hospital costs between countries caused by substance dependence could show the different impact of drug treatments on public budgets.

While activity data are well established in Europe, there has been limited information on the expenditure on drug treatment in hospitals. Difficulties are due to differences in definitions, data and organizational structures across countries. Therefore comparable estimates are scarce and the datasets available are still not fully explored (Lievens et al., 2014).

The analysis of expenditure on treatment by disease, in which includes the analysis of expenditure on treatments for drug and alcohol use, has been recently taken on by several international entities. As a starting point, international frameworks for public expenditure on health include the Classification of the Functions of Government (COFOG), published by Eurostat, and the System of Health Accounts (SHA), published by Eurostat, the OECD and WHO. These latter entities established a common framework for a joint healthcare data collection for SHA-based accounts.

COFOG focuses on government spending on healthcare while the SHA records the total expenditure on health (private and public). With the development of the SHA data system, this database has provided estimated data for different financing schemes.

Subsequent efforts at a disease level focused on expenditure in the hospital inpatient sector, but envisage covering other areas such as outpatient care and pharmaceutical spending, where data compilation has been more difficult. Using the aggregates from SHA-based accounts as a base, data can be reported in accordance with the 1st level of the International Shortlist for Hospital Morbidity Tabulation (ISHMT) and with the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10). Mental health and behavior disorders encompasses the F10 - F19 codes ('diagnosis related to mental and behavioral disorders due to psychoactive substance use and alcohol'). Disaggregated data are not published for these individual codes, though. In 2013, Eurostat funded a 30-month research project, the Health expenditure by Disease and Conditions (HEDIC), to develop the methodology for health expenditure by disease to monitor EU health, which has also contributed to progress in estimating expenditure by disease in European countries.

The current study aims to estimate national expenditure on the treatment of illicit drugs and alcohol use provided in hospitals in the European Union and Norway, using reliable and comparable data and; sound modeling approaches. Additionally, this study aims to build on the existing methodologies and to develop a method easily replicable. Last but not least, this study aims to be a first step to develop models to perform policy evaluation and cost-effectiveness analysis in this field.

All in all, this study will:

1. Explores the availability of hospital data on drug and alcohol use diagnosis in the European countries;
2. Analyzes recent trends on hospital activity indicators related to drug and alcohol diagnoses: bed days and discharges;
3. If direct data on costs are not available, estimates the costs of treating drug and alcohol diagnosis;
4. Understands the main factors that influence hospital activity and explains trends in this expenditure.

To accomplish these aims different steps were taken. First, authors reviewed the existing literature to identify the main issues arising from the estimates of costs of inpatient drug treatment in hospitals. Data limitations have been identified as an active constraint to this modelling exercise. As a second step, authors reviewed international datasets and listed the existing type of variables, countries and the time periods with annual data available. Third, a theoretical model has been developed to estimate hospital costs. Then, as a fourth step, authors estimated the most likely ranges of national expenditure on inpatient drug treatment. Fifth, authors compared results with other attempts to estimate these expenditures. Sixth, a panel data analysis was carried out to identify the main drivers of hospital expenditures to finance the treatment of drug and alcohol diagnosis.

2. HOSPITAL COSTS ON DRUG AND ALCOHOL USE: A REVIEW OF METHODS AND LITERATURE

2.1. METHODS REVIEW

Estimating hospital expenditures can be a controversial issue, if imperfections in health care markets are assumed. Valuing the resources spent on treating drug and alcohol use diagnosis, in a competitive and private environment, it usually based on market prices – according to the economic theory and, therefore, the price of a service is approximately the marginal cost of the resources used when this service is provided. In publicly financed systems, whereas competition may not be the only aim of the service provider and, therefore, valuation methods may also differ; resources are frequently estimated by valuing inputs. At this point, various alternatives exist:

1. Valuing resources with a cost valuation method based on activity, such as the Activity Based Costing (ABC). This option is applied if the objective is to achieve a very accurate estimate of the cost generated by a process or a service, being time and resources consumed;
2. Valuing resources based on the analytical accounting system of suppliers. In this case, it is not a question of generating new data, as

was the case with the previous option. Rather, this system relies on using data from an already existing healthcare entity;

3. Rely on micro-cost database: use data provided by secondary sources, published in reports and/or in scientific articles and; other complementary activity data publically available (ex., prevalence rates, discharges from treatment centres, number of treated patients, etc..) published by the agencies, ministries and other corresponding entities.

In countries where hospital charges are calculated in detail, cost estimates are common. Charges are converted to costs, using the standard cost-to-charge ratio method (Taira and al., 2003 and Nigrovic and Chiang, 2000). In other countries, estimates are based on the average hospital cost or on estimates provided by the Diagnosis-Related Groups system (DRG) (Drummond et al., 2015). The DRG values medical episodes according to typical hospitalization episodes, applied to groups of patients with similar clinical characteristics and with relatively homogeneous resource consumptions. It describes hospital activity classified by standardized units of episodes. Consequently, with the help of this DRG system, hospital managers and policymakers can compare the provision of health episodes by, for instance, lengths of stay or costs. Additionally, it also allows describing the characteristics of patients with the same DRG, either across hospitals or in the same hospital.

Last but not least, the application of financial data to cost estimates may be limited for several reasons. First, these data are frequently not available. Secondly, even when available, comparability of data may be limited because accounting practices may vary. Different systems of accounting for the amortization of equipment, overhead costs or subsidies may lead to marked differences in estimates, and consequently, may complicate comparisons across countries. Busse et al. (2008) argue that marked differences in cost estimates for identical services found in different countries are due to differences in 1) definition of the start and end of the service provided; 2) technology applied; and 3) the system applied to account associated services (Drummond et al., 2015).

Drug-related public expenditure is frequently classified as 'labelled drug-related expenditure' versus 'unlabelled expenditure' (EMCDDA, 2008). Labelled drug-related expenditure is the ex- ante planned expenditure that reflects, among other factors, the voluntary commitment of governments in the field of drugs. Commonly, drug and alcohol related expenditures are not accounted as labelled drug-related expenditure. Commonly, they are included in the overall hospital budgets and depend upon the number of patients presenting for treatment, which cannot be accurately known at the beginning of the financial year.

Hospital expenditure, as an 'unlabelled drug-related expenditure' needs to be estimated using modelling approaches. The two types of modelling approaches most commonly used are the 'top-down' and the 'bottom-up' approaches (EMCDDA, 2008). The top-down modelling approach is mainly used when data on drug-related expenditure are embedded in programmes with broader goals and the fraction attributable to drugs is disentangled using relevant, representative and measurable criteria. Criteria are frequently based on activity data, such as drug-related discharges or total number of bed days. Conversely, the bottom-up modelling approach starts by estimating the cost of providing an individual unit of each

treatment, taking into account all possible productive factors. Then, it estimates the costs of providing all types of treatment to all clients.

This study will apply the top-down approach to disentangle the proportion of hospital expenditure spent on alcohol and drug treatments.

2.2. LITERATURE REVIEW

Most estimates for the costs of treating substance and alcohol use in hospitals have applied a cost-of-illness approach. This approach estimates the amount of resources devoted to handle the drug use disease from the perspective of society, compared to the resources liberated should this disease be eradicated. Other approaches used are based on the hospital or the health care system perspective. Then, instead of estimating the costs of handling this disease, estimates focus on the cost and benefits of providing a specific type of treatment and compare them with the costs and benefits of therapeutic alternatives. In this case, cost-effectiveness is the approach used.

For the literature review, several databases were reviewed: PubMed, Econlit, Scopus and Web of Science. The search looked for scientific articles published in English. The search criterion were the following keywords in all fields of the article: 'hospital expenditures', 'alcohol', 'drug use', 'in-patient'; 'diagnosis', 'public spending', 'costs', 'heroin', 'hospital' and 'discharge'. The revision only considered studies published in the last 10 years.

The studies considered in this revision are original studies that present estimates on the hospital costs related to drug and alcohol diagnosis. The exclusion criteria were: studies with no estimates for public spending (but if studies would include other sources of financing as well, they were accepted); studies focusing on psychiatric hospitals discharges only and; studies that did not separate hospital costs from other cost categories.

The search in electronic databases reported a total of 406 studies. 19 studies have been identified through cross referencing and other sources. Once removing the duplicates, abstracts were examined. From this analysis, 33 studies complied with the criterion and were reviewed. From the revision of the full text of these studies it resulted that 16 studies could be considered. Annex 1 summarizes the studies under analysis.

The main limitations of this multi-country studies are the scarcity of financial data and variations in accounting practices. Among the studies reviewed, Lievens et al (2014) compared the hospital costs of treating drug and alcohol abuse in Europe. Consequently, this article will be used as a potential benchmark for equivalent results attained here.

Within these articles, 10 studies adopted the perspective of the whole society and they included estimates for both direct (health and non-health) costs and indirect costs. Authors considered indirect costs the lost productivity as a consequence of drug use as well as costs of premature deaths caused by drug use². The 6 remaining studies adopted the perspective of health providers.

² Intangible costs can also be measured and are frequently associated to the costs provoked by (mental or physical) suffering caused by drug use. These studies have not estimated intangible costs, though.

The analysis by diagnosis reveals that five studies estimated hospital costs due to alcohol diagnosis only, 4 studies due to drug consumption and 7 studies estimated costs derived from both alcohol and drug related illnesses.

In relation to the methodologies used for accounting costing hospital expenditures, 10 out of 16 studies based estimates on patient-level data. 7 of these studies used case-mix groups costs (e.g. DRGs) and; 3 studies used a micro-costing approach – estimating each component of resource use. In the 6 remaining studies, hospital costs were calculated based on aggregate organizational data, using average costs by disease or average daily costs. Taking into account the accuracy of costing, these methodologies are known to be less precise than the approaches that use micro-costing or DRGs (Drummond et al., 2015).

3. ESTIMATING HOSPITAL COSTS: DATA AND METHODOLOGY

3.1. DATA

The EUROSTAT database is, among other ends, used to gather activity and financial data on hospitalizations due to the treatment of alcohol and drug use-related illnesses and covers the European Union (28), Norway, Liechtenstein, Iceland and Switzerland.

EUROSTAT also publishes annual data for hospital expenditures, by financing scheme, function and provider. These data comply with the System of Health Accounts (OECD, Eurostat and WHO, 2011). Therefore, EUROSTAT publishes data for expenditure on health care providers, which have the provision of health care goods and services according to the International Classification of Health Providers (ICHA-HP). This dataset includes total (public and private) aggregated current expenditure on general hospitals, mental hospitals (mental and substance abuse hospitals included) and other specialized hospitals, e.g. that assist mental health³. Data sources are mainly administrative and register-based data, only a small percentage of the figures come from surveys or other means. Note, first, that the ICHA-HP classification does not distinguish between public and private ownership neither the legal status of establishments.

When defining hospitals, it means licensed establishments that are primarily engaged in providing medical, diagnostic and treatment services. They include physicians, nursing and other health services provided to inpatients and also include specialized accommodation services necessary. The tasks of hospitals may vary by country and are usually defined by legal requirements.

Health care data on activities are largely based on administrative data sources. Therefore, they reflect the country-specific way of organizing health care and may not always be completely comparable across countries.

Concerning data on hospital activity, this study will use data on 'hospital patients' provided by two types of indicators that OECD publishes. The first indicator is data on 'Hospital patients'. It refers to the number of (1) hospital discharges of in-patients and day cases, split by age, sex, and selected (groups of) diseases and; (2) to the average length of stay of in-patients aggregated by the same criteria. In both cases, data are classified according to the list of diagnostic categories, based on the

³ See <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>, verified 22/08/2018.

International Shortlist for Hospital Morbidity Tabulation (ISHMT) and the ICD-10 codes.

A (hospital) discharge is the formal release of a patient from a hospital after a procedure or course of treatment (episode of care). A discharge occurs anytime that a patient leaves because he/she has finalized a treatment, signs out against medical advice, transfers to another health care institution or because of death. A discharge can refer to in-patients or day cases. An 'in-patient' is a patient who is formally admitted (or 'hospitalized') in an institution for treatment and/or care and stays for a minimum of one night or more than 24 hours in the hospital or other institution providing in-patient care. The average length of stay is calculated from the total number of nights spent in hospitals by in-patients divided by the total number of discharges.

Last but not least, EUROSTAT also publishes national data on hospital activity, referring to contacts between patients and the health care system⁴.

Finally, some data considerations should be highlighted. Firstly, both activity and expenditure data comprise information about all types of hospital providers. Hospitals included are general hospitals (HP.1.1), mental health hospitals (HP.1.2) and other specialized hospitals (HP.1.3).

Additionally, no distinction is made by financing schemes, therefore, activity data from public, non-profit, and private hospitals are considered. Taking into account that different type of hospital providers and financial schemes exist, data are not fully homogenous, which reduces comparability across countries (see Annex II).

Moreover, Eurostat does not report data on external causes for diagnosis (codes V00-V98 from the ICD-10), because the reporting rate of this type of data has been low in most European countries. The same is true for the diagnosis 'Live-born infants according to place of birth and type of delivery' (Z38)⁵. Note that excluding these codes may lead to an overestimation of hospital costs. However, excluding improves comparability between countries and provides more reliable time series for hospital activity and for costs of alcohol and drug hospitalizations. In order to estimate the differences in hospital costs, consequent to considering or excluding these diagnoses, a specific analysis was carried out. The number of bed days, used due to external causes were estimated (using average crude rate for hospital admissions in the EU(28) due to injuries over the period 2012-2014 - EuroSafe, 2016). Once the number of inpatients is calculated, the number of bed days due to injuries were estimated using the average length of stay for 'Other injuries' diagnoses obtained from the EUROSTAT database (codes S10-S51, S53- S71, S73-S81, S83-T14, T79).

3.1. METHODOLOGY

Departing from the total expenditure on hospitals, the model estimates the expenditure on drug and alcohol (as first diagnosis) treatment in hospitals. The proportion of expenditure used to fund the treatment of drug use (and alcohol use) will be disentangled using criterion which take into account the available activity data.

⁴ See http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=hlth_co_dischls&lang=en, consulted 20/08/2018.

⁵ For example, in 2016, Spain started recoding data according to Z38 category because the classification system was revised, from ICD-9-CM to ICD-10ES-CM

Therefore, an attributable fraction will be estimated based on the proportion of average bed days which main diagnostic is drug use (and alcohol use).

Considering $ExpH_{it}$ as the total expenditure on hospitals, spent by country i and period t , to estimate the proportion of hospital expenditure that is spent in inpatient drug treatment, the following variables are presented (the same for alcohol expenditure):

$BdIH$: Total number of bed days, in all diagnosis, due to in inpatient treatment in hospitals.

$BdIH^D$: Total number of bed days, in drug treatment (F11-F19), due to in inpatient treatment in hospitals.

The proportion of expenditure allocated to in-patient drug treatment in hospitals is estimated taking into account the proportion that bed days for treating drug use represents on the total of bed days due all diagnosis (the same for discharges is a repartition key), then expenditure in bed days are:

$$ExpBd_{it}^D = \frac{BdIH_{it}^D}{BdIH_{it}^T} * ExpH_{it}$$

To analyze the main drivers of hospital expenditures, involved in the payment of health problems caused by drug and alcohol uses, a panel data estimating approach was employed. The basic functional form of the estimated panel equation is given by:

$$\ln h_{it}^e = \alpha_i + x'_{it} + u_i + \varepsilon_{it}$$

in which i and t represent, respectively, country and years. Then, $\ln h^e$ is the log of the hospital expenditure on drugs/alcohol treatment, per capita, in real terms. In the left part of the equation, α_i estimates the random country-specific effects; x'_{it} is a vector of variables capturing the structure of health systems, as well as domestic income and the intensity of substance use; u_i is a group-specific random element and; ε_{it} is the residual error.

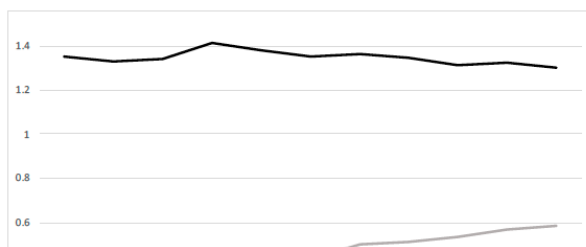
4. RESULTS

4.1. HOSPITAL ACTIVITY DUE TO ALCOHOL AND DRUG USE

First, this study provides a broad overview of recent trends in hospital activity, to set the background for the analysis. Hospital activity has been assessed consulting a spectrum of relevant databases with data on healthcare activity, over 2005-2015 period. EUROSTAT provided complete datasets on requested health statistics for 19 European countries over this ten years period.

Graph 1 shows trends for the proportion that alcohol and drug use diagnosis represented on total diagnosis, when measured by the number of bed days in hospitals. While alcohol treatment remained relatively stable during this period, the provision of drug treatment slightly increased over the decade (in 2015, drug treatment represented 0.6%, of the total bed days used in hospitals, as compared to 0.4%, in 2005).

Graph 1. Trends in hospital activity: bed days (2005-2015, 19 European countries)

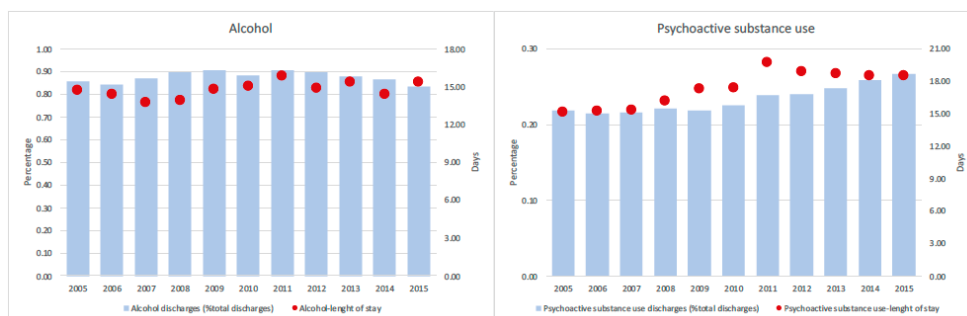


Source: Based on Eurostat (2018)

Note: Calculations are based on data from the following countries: Bulgaria, Czechia, Denmark, Germany, Ireland, Spain, France Croatia, Italy, Latvia, Luxembourg, Hungary, Malta, Netherlands, Austria, Portugal, United Kingdom, Norway and Switzerland.

Graph 2 shows the proportion of discharges of the total and the average length of stays in hospitals due to alcohol and psychoactive substance use, diagnosed between 2005 and 2015.

Graph 2. Trends in hospital activity: discharges and length of stay (2005-2015, 19 European countries)



Source: Based on Eurostat (2018)

Note: Calculations are based on data from the following countries: Bulgaria, Czechia, Denmark, Germany, Ireland, Spain, France Croatia, Italy, Latvia, Luxembourg, Hungary, Malta, Netherlands, Austria, Portugal, United Kingdom, Norway and Switzerland.

Note that the proportion of discharges due to alcohol remained stable over this period (0.8%). However, since the total number of discharges decreased significantly between 2008 and 2015, it means that alcohol discharges have followed the overall national trend, i.e., diminished.

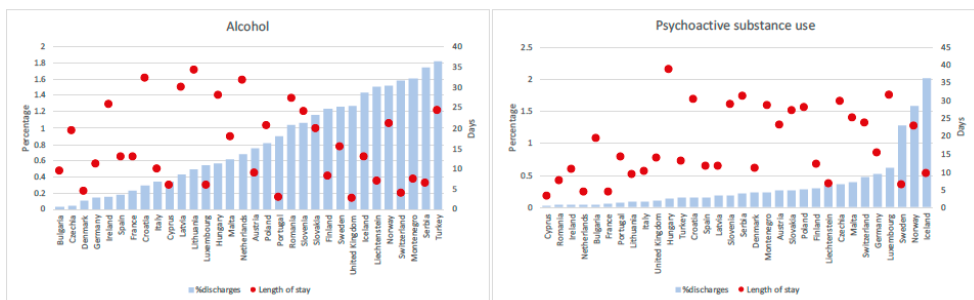
The trends observed in the proportion of discharges caused by the treatment of substance use, showed a slight increase over this period, from 0.2% to almost 0.3%. Additionally, the length of stay for hospitalizations caused by drug diagnosis increased also. Between 2005 and 2015, the average length of the stay increases by 0.6 days (for alcohol) and by 3.4 days (for drug use episodes). Data show that the length of stay in hospitals due to drug use use diagnosis is higher than the length of stay due to alcohol. This difference increases over the years, from 0.4 days in 2005 to 3 days in 2015.

If only 2015 is analyzed, 13 countries can be added to the sample (Graph 3). In this year, alcohol diagnosis represented between 0.03% to 1.8% of total first diagnoses, and drug use diagnoses represented between 0.02% and 2.0%. Turkey and Serbia reported the higher levels of alcohol as first diagnoses for discharges (1.7%); and Norway and Iceland reported the higher proportion of discharges associated to drug use (1.6% and 2%, respectively). Bulgaria and the Czech Republic reported the lowest proportions of discharges associated to alcohol diagnosis (0.1%). While nine countries reported a percentage lower than 0.1% associated to drug use as the first diagnosis. Cyprus and Romania reported the lowest percentages of discharges (0.02% and 0.03%, respectively).

Comparing the time that patients spend in hospitals on average associated to drug and alcohol diagnosis, alcohol treatment leads to stays two days longer than treatment for drug use, in 2015. The average length of stay of alcohol in-patients ranged from 2.8 to 34.2 days, in the United Kingdom and Lithuania, respectively. The longest average length of stay for alcohol in-patients was reported by Latvia, Netherlands, Croatia and Lithuania (ranged between 30 and 34 days). It may suggest that the types of inpatient treatment offered and institutions providing care vary markedly in those countries.

For drug use episodes, the average length of stay ranged from 3 days in Cyprus (4 days in the Netherlands) to 39 days in Hungary. For drug use diagnoses, Croatia, Serbia, Luxembourg and Hungary registered the highest lengths of stay, ranging between 30 and 39 days. Again, the different structures of drug treatment and different types of treatment provided should explain these differences.

Graph 3. Discharges and length of stay in hospitals (2015, 32 European countries)



Source: Based on Eurostat (2018)

There are some countries where drugs and alcohol diagnoses represent a high percentage of total discharges and in-patients stay longer in the hospital. This is the case in Turkey and

Norway. There, alcohol and drug hospitalization diagnoses represent a high percentage of the total discharges and; patients spend a high number of days in the hospital.

4.2. HOSPITAL EXPENDITURE

Data available for hospital expenditure are an additional challenge. But, in this case to implement a top-down approach and build a time-series, consistent data for expenditure and health provision activity were available for 24 countries (which we will call Europe(24) hereafter)⁶.

Therefore, Table 1 presents the estimates for the total expenditure on hospitals to pay for the treatment of drug and alcohol consumption diagnostics, over the 2013-2015 period.

In 2015, the model estimates that the Europe(24) countries spent EUR 5.9 billion on hospital treatment of alcohol diagnoses⁷ (equivalent to 0.5% of total health expenditure) and EUR 3.3 billion on drug diagnoses (0.29% of total health expenditure). The difference in hospital expenditures between these groups of diagnoses remained stable over these three years, varying within the range EUR 2,6 – EUR 2,8 billion and; per capita expenditure on hospitals was EUR 18.6 and EUR 14.4 on alcohol and drug diagnosis, respectively.

Comparing expenditure trends, hospital expenditure on drug use diagnosis increased more than the spending on alcohol diagnosis, over the 2013-2015 period. Over this period, total hospital expenditure on drug treatments increased by 15% (EUR 421 million) and hospital expenditure per capita by 8% (EUR 1.1).

Including expenditure on injury treatments⁸, the proportions that drug and alcohol expenditures represent of total expenditure decreased. Focusing on 2015, the reduction was estimated as 280 million euros for total expenditure in hospital treatments for alcohol diagnoses (173 million euros in drug diagnoses) and 1 euro per inhabitant in alcohol hospital treatments (0.9 euros per inhabitant in drug treatments).

Table 1. Expenditure on alcohol and drug treatments in hospitals and number of bed days (2013-2015, 24 countries)

	2013			2014			2015		
	Bed days (% of total)	Total hospital expenditure EUR millions (% of total HE)	Hospital expenditure (per capita, EUR)	Bed days (% of total)	Total hospital expenditure, EUR millions (% of total HE)	Hospital expenditure (per capita, euros)	Bed days (% of total)	Total hospital expenditure, EUR millions (% of total HE)	Hospital expenditure (EUR, per capita)
<i>A) Excluding V00-Y98 and Z38 codes</i>									
Alcohol diagnoses	1.46%	5,622.46 (0.53%) 2,847.13	18.47 €	1.44%	5,638.41 (0.52%) 2,976.04	17.65 €	1.48%	5,874.22 (0.52%) 3,267.72	18.58 €
Psychoactive substance use	0.68%	(0.26%)	13.31 €	0.73%	(0.28%)	13.75€	0.77%	(0.29%)	14.40 €
<i>B) Including injuries</i>									
Alcohol diagnosis	1.39%	5,357.65 (0.51%) 2,698.82	17.52 €	1.37%	5,373.12 (0.50%) 2,820.51	16.73 €	1.41%	5,593.81 (0.52%) 3,094.56	17.60 €
Psychoactive substance use	0.65%	(0.24%)	12.54 €	0.69%	(0.26%)	12.94 €	0.73%	(0.28%)	13.54 €

Source: Based on Eurostat (2018) and EuroSafe (2016).

Note: 2015 prices based on Hospital Services index for EU28 (Eurostat 2018).

⁶ Calculations are based on data from the following countries: Austria, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and United Kingdom.

⁷ Data for expenditure on hospital treatment episodes exclude extraordinary events (codes V00-Y98 and Z38 codes).

⁸ Including the expenditure on the treatment of 'Other injuries' diagnoses (codes S10-S51, S53-S71, S73-S81, S83-T14, T79)

This study aims also to explain the different patterns of expenditure on alcohol and drug treatment in hospitals in Europe. In order to allow for a more detailed analysis of patterns of expenditure trends, countries will be grouped. This aims to allow a systematic analysis of the patterns of hospital expenditure on target diagnosis.

The criterion used to group countries is the percentage that government expenditure on health, when added to the expenditure on mandatory social insurance financing schemes, represent of the total health expenditure. This criterion aims to group countries with a similar structure of health provision, in terms of the share that public health represents of the total health provided and, consequently, of the free/cheap rates by the overall population to access health services.

Table 2 shows the estimates of national expenditure on hospitals to treat alcohol and drug use, for Europe(24). Estimates need to be compared carefully, because part of these differences could be explained by data limitations. For instance, differences in data availability and in the methodology applied for hospital costs accounting.

Countries where public financing exceeds 80% of the total expenditure on health tend to spend more on the treatment of both alcohol and drug diagnoses in hospitals (Table 2)⁹. In 2015, countries where public funds exceeded 80% of total expenditure, alcohol expenditure in hospitals represented 0.75% of the total health expenditure (0.68% for drug use diagnoses). These proportions are relative higher than those observed in the other groups of countries, whereas the proportion of public spending on health represented a smaller proportion of the total. Considering spending per inhabitant, drug treatment expenditure exceeded alcohol by EUR 2.5 euros.

⁹ This fact can be either explained by a large proportion of spending on hospitals, compared to other settings, or to a larger volumes on total absolute expending on health, including the spending on substance abuse (alcohol and drugs) in hospitals. The econometric model developed later in this study will analyse these possibilities.

Table 2. Treatment of substance and alcohol use in hospitals: expenditure and bed days (2015, 24 European countries grouped by the proportion of public health spending) ‡

Country	Bed days due to alcohol diagnoses (% of total bed days)	Expenditure on alcohol treatment, in hospitals (% of total HE)	Expenditure on alcohol treatment, in hospitals (per capita, EUR)	Bed days due to psychoactive substance use diagnoses (% of total bed days)	Expenditure on treatment of psychoactive substance use, in hospitals (% of total HE)	Expenditure on treatment of psychoactive substance use, in hospitals (per capita, EUR)
Public expenditure is less than 70% of total HE †						
Cyprus	0.05%	0.021%	0.29 €	0.01%	0.004%	0.06 €
Lithuania	1.33%	0.456%	3.78 €	0.10%	0.035%	0.29 €
Bulgaria	0.75%	0.253%	1.31 €	0.16%	0.054%	0.28 €
Portugal	0.37%	0.154%	2.40 €	0.13%	0.055%	0.86 €
Latvia	1.46%	0.474%	3.31 €	0.27%	0.087%	0.61 €
Hungary	1.72%	0.623%	4.98 €	0.53%	0.190%	1.52 €
Poland	4.58%	1.632%	11.71 €	1.16%	0.413%	2.96 €
Switzerland	2.69%	0.939%	82.96 €	1.30%	0.456%	40.27 €
Mean (SD)	1.62% (1.45)	0.57% (0.52)	13.84 € (28.14)	0.46% (0.50)	0.16% (0.18)	5.86 € (13.94)
Public expenditure is between 70% and 80% of total HE †						
Romania	0.45%	0.173%	0.69 €	0.03%	0.012%	0.05 €
France	0.50%	0.193%	7.32 €	0.05%	0.018%	0.70 €
Ireland	0.36%	0.127%	5.31 €	0.08%	0.028%	1.18 €
Italy	0.21%	0.094%	2.30 €	0.12%	0.053%	1.28 €
United Kingdom	0.46%	0.193%	7.58 €	0.21%	0.088%	3.46 €
Spain	0.34%	0.146%	3.09 €	0.26%	0.111%	2.36 €
Finland	1.15%	0.405%	14.65 €	0.39%	0.138%	4.99 €
Croatia	2.68%	1.151%	8.69 €	0.48%	0.205%	1.55 €
Austria	1.97%	0.752%	31.23 €	0.73%	0.280%	11.62 €
Mean (SD)	0.90% (0.87)	0.36% (0.36)	8.98 € (9.31)	0.26% (0.24)	0.10% (0.09)	3.02 € (3.56)
Public expenditure is more than 80% of total HE †						
Netherlands	0.10%	0.038%	1.63 €	0.04%	0.015%	0.64 €
Denmark	0.65%	0.285%	14.14 €	0.45%	0.200%	9.92 €
Germany	2.03%	0.593%	24.62 €	0.87%	0.254%	10.56 €
Czechia	2.28%	0.946%	10.81 €	1.11%	0.461%	5.27 €
Sweden	1.08%	0.411%	20.84 €	1.45%	0.554%	28.07 €
Luxembourg	4.98%	1.567%	88.11 €	2.19%	0.689%	38.73 €
Norway	3.39%	1.380%	94.11 €	6.43%	2.617%	178.37 €
Mean (SD)	2.07% (1.69)	0.75% (0.57)	36.32 € (38.18)	1.79% (2.16)	0.68% (0.88)	38.80 € (62.99)

Source: Authors' estimatyes are based on Eurostat dataset (2018)

Notes:

‡ Excluding V00-Y98 and Z38 ICD-10 codes.

† Percentage of total expenditure on health financed by Government and compulsory contributory health care financing schemes.

In the group of countries, whereas the percentage of public financing ranges between 70% and 80%, hospital expenditure on alcohol treatments is EUR 6 higher than on drug-related diagnoses, per capita. Austria presents the highest expenditure per capita on the treatment of alcohol related diseases in hospitals (EUR 31); followed by Finland (EUR 14.6) and; by Croatia (EUR 8.7). Expenditure per capita on drug treatment was higher in Austria and Finland (EUR

11.6 and EUR 5, respectively). Croatia and Austria reported the highest shares of alcohol and drug expenditure, over the total healthcare expenditures. In 2015, expenditure on alcohol treatments in Croatia was equivalent to 1.2% of total healthcare expenditures, while it reached 0.8% in Austria. These shares of drug treatments were over the mean for this subgroup of countries (0.2% and 0.3%, respectively).

The third group of countries, whereas public financing is below 70% of total health expenditure, expenditure per capita on alcohol treatments is EUR 13.8 and EUR 5.9 euros on drug treatment. Switzerland (EUR 83) and Poland (EUR 11.7) registered the highest expenditures on alcohol treatment, while at the other end of the range, Cyprus and Bulgaria spent EUR 0.3 and EUR 1.3. Per capita spending on drug treatments ranged from EUR 40 euros in Switzerland to EUR 3 in Poland and; falling to EUR 0.1 in Cyprus and EUR 0.28 in Bulgaria. As a percentage of total health expenditure, expenditure on alcohol and drug treatments registered the highest value in Switzerland and Poland (0.9% and 1.6% for alcohol treatments, and 0.5% and 0.4% for drugs, respectively).

4.3. HOSPITAL EXPENDITURE-DRIVERS

This study performs a panel data regression, which combines data for 27 European countries and covers ten years (2006-2015 period)¹⁰. The aim of this analysis is to determine the main factors that drive hospital expenditure on alcohol and drug treatment. Authors based their analysis on three sets of explanatory variables. First, expenditure may be driven by the characteristics of the health provision system. Second, expenditure can be driven by the socio-economic characteristics of countries. Last but not least, expenditure can be driven by the epidemiologic situation of countries in the fields of drug and alcohol use.

To assess health system characteristics, this study used variables that describe the financing structure of hospitals availability of drug treatment. The financing structure of hospitals is assessed by the percentage of total health expenditure that is public financed (see, for example, Culyer, 1988; van der Gaag and Stimac 2008; Wagstaff, 2009). Additionally, the availability of drug and alcohol treatment was assessed through the number of outpatient treatment units reported for drug and alcohol, per 100000 inhabitants.

The second type of variables depicts the social economic framework experienced by countries which may impact on national health provision. The Gross Domestic Product, per capita, recurs in literature as an important explaining factor for differences in health care expenditures across countries (see, Hitiris and Posnett, 1992; Ke et al., 2011; or Farag et al., 2012). Consequently, GDP per capita is included in estimates as an explanatory variable.

Last but not least, the model explains expenditure on drug and alcohol treatment with data depicting countries' epidemiologic situation. Due to the absence of longitudinal and homogeneous data on the prevalence on drug and alcohol use for a significant number of countries – a trend analysis is only possible in a small number

¹⁰ Calculations are based on longitudinal data from the following countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, and United Kingdom.

of countries and for a limited number of years— the seriousness of the problem substance use (alcohol and drugs) was assessed with the help of two variables: the number of drug and alcohol-related deaths, per 100,000 inhabitants and; the number of clients under opioid treatment (only for drug treatments regressions). Table 3 shows the variables used in the panel data estimates.

Table 3. Variable labels, definitions and sources

VARIABLES	Definition	Source
Hospital treatment expenditure due to alcohol and drug consumption		
<i>lndrug</i>	Logarithm of the expenditure on hospital drug treatment per capita (2015 prices)	Eurostat: Hospital discharges and length of stay statistics; healthcare expenditure statistics and price statistics (health services prices)
<i>lnalcohol</i>	Logarithm of the expenditure on hospital alcohol treatment per capita (2015 prices)	Eurostat: Hospital discharges and length of stay statistics; healthcare expenditure statistics and price statistics (health services prices)
Health system variables		
<i>publicexp</i>	Public expenditure on healthcare (% of the total health expenditure)	Eurostat - Healthcare expenditure statistics
<i>outpatient_units</i>	Number of units supplying drug and alcohol outpatient treatment, per 100,000 inhabitants	EMCDDA - Treatment demand statistics (Statistical Bulletins)
Income variable		
<i>lnGDPpc</i>	Logarithm of the GDP, per capita (PPPS/real terms)	Eurostat - National Accounts
Problem drug use		
<i>opioidclients_nt</i>	Number of clients under opioid treatment per 100,000 inhabitants (treated for the first time)	EMCDDA - Treatment demand statistics (Statistical Bulletin, TDI dataset).
<i>deathrate_alcohol</i>	Alcohol deaths per 100,000 inhabitants (ICD code: F10)	WHO - Causes of death statistics
<i>deathrate_drug</i>	Drug dependence deaths per 100,000 inhabitants (ICD codes: F11-F16; F18-F19)	WHO - Causes of death statistics

Table 4 displays the descriptive statistics for the main set of variables of the model, over the 2006-2015 period. The annual expenditure on drug treatment in hospitals was 11.32€ , per patient, at 2015 prices and on average. Expenditure on alcohol treatment in hospitals was EUR16.12.

Annual substance-related deaths were higher for drug than for alcohol abusers 2.7 and 0.3, respectively. Notice however, that these results might be biased by different national prevalence ratios and patterns of drug and alcohol abuse. Additionally, the practices of recording and reporting deaths, may influence mortality rates and its trends, affecting cross- country comparisons.

Table 4. Summary statistics of the explanatory variables

Variable	Obs	Mean	SD	Min; max
Expenditure on hospitals for drug and alcohol treatments)				
Hospital expenditure - drug treatment	148	11.32	29.22	0.003; 178.37
Log hospital expenditure – drug treatment	148	0.78	1.87	-5.75; 5.18
Hospital expenditure - alcohol treatment	153	16.12	23.45	0.04; 99.35
Log hospital expenditure – alcohol treatment	153	1.96	1.41	-3.34; 4.60
Health system variables				
Percentage of public expenditure on health	187	73.97	8.84	42.62; 85.4
Outpatients units (per 100,000 inhabitants)	230	1.37	1.39	0.0; 8.49
Income variable				
GDP per capita	300	27,381	11,778	9,200; 77,300
Log GDP per capita	300	10.14	0.40	9.13; 11.26
Disease burden variables				
Death rate - alcohol (per 100,000 inhabitants)	275	0.33	0.54	0.0; 2.84
Death rate - drug (per 100,000 inhabitants)	288	2.71	2.63	0.0; 15.28
Clients on opioid substitution treatment (per 100,000 inhabitants)	247	8.14	7.91	0.14; 35.57

This modeling approach provides interesting conclusions. Table 5 displays the results of our model. Expenditures on drug and alcohol treatment in hospital are explained by the organizational characteristics of national health provision systems, by a set of social economic factors and; by alcohol and drug use epidemics.

First, the model concludes that the organizational characteristics of treatment systems impact on expenditure on substance treatment. It concludes that countries where the public sector is in charge of providing/financing a larger proportion of health services tend to spend more on alcohol and drug treatment in hospitals, per capita. In this model, the characteristics of country's health system, more specifically, the public intervention in the provision of health services is measured by the percentage of public expenditure on total spending on health and by the number of outpatient units per 100,000 inhabitants. This model shows that the percentage of public expenditure on total spending on health is positively related to hospital expenditure on both drug and alcohol treatments. This effect is smaller in alcohol, though, implying probably that more private sector can be involved in the provision of alcohol treatments in hospitals. In fact the model shows that hospital expenditures on drug treatment increase by 8%, for each additional unit point of public expenditure (3% for alcohol episodes).

Table 5. Regression results

Explanatory variables	Hospital drug treatments			
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
Public Exp.	0.0769**	0.332	0.075**	0.038
lnGDPpc	1.395**	0.677	1.866*	0.705
deathrate_drugs	0.206***	0.115	0.14**	0.062
outpatient_units			-0.262***	0.155
opioidclients_nt	-0.017**	0.008	-0.017*	0.006

<i>_cons</i>	-19.337*	5.211	-23.506*	4.974
Obs.	103		Obs.	88
Countries	22		Countries	21
R-sq:			R-sq:	
within	0.03		within	0.05
between	0.67		between	0.71
overall	0.57		overall	0.58
Hospital alcohol treatments				
<i>Explanatory variables</i>	<i>Coef.</i>	<i>Robust Std. Err.</i>	<i>Coef.</i>	<i>Robust Std. Err.</i>
<i>publicexp</i>	0.031*	0.012	0.04*	0.011
<i>lnGDPpc</i>	0.879**	0.436	1.051**	0.432
<i>deathrate_alcohol</i>	0.148**	0.068	0.129**	0.061
<i>outpatient_units</i>			0.008	0.075
<i>_cons</i>	-9.657**	4.0	-12.104*	3.85
Obs.	134		Obs.	104
Countries	27		Countries	24
R-sq:			R-sq	
within	0.03		within	0.002
between	0.6		between	0.73
overall	0.6		overall	0.73

Note: Hausman Test rejects fixed effect specification. *, **, *** indicate significance at the 1, 5 and 10 % level.

Another conclusion of this model is that the impact outpatient treatment is negative, on the financing of drug treatment in hospitals; but not statistically significant on spending on alcohol treatment. Therefore, this model may suggest that increasing the availability of outpatient treatment may reduce the spending on hospital drug treatment because, first, it substitutes hospital treatment and, second, because it is a less expensive form of treating drug patients. Therefore, both reasons allow diminishing the spending on hospital drug treatments. Table 5 shows that if the number of outpatient units increases by one unit, the expenditure on hospital drug treatments decreases by 30%¹¹. Note that this variable is not statistically significant when the expenditure on alcohol treatment episodes is considered.

When the impact of the economic background is assessed, the model shows that an increase of the GDP per capita, leads to increases in hospital expenditure on the treatment of substance abuse in general (alcohol and drugs). Coefficients measure how one percentage point increase of the GDP per capita impacts on expenditure on drug/alcohol treatment; in another words, these coefficients measure the income elasticity of substance-related health expenditure or the response of demand for health care to changes in gross domestic product.

Coefficients are larger (and significantly above one) for hospital expenditure on drug treatments than for expenditure on alcohol treatment. In practice, it means that in situations of economic growth, expenditure on drug-related treatments in hospitals tends to grow and, eventually, grow more than GDP. By the same token, in situation

¹¹ Note that when the variable 'number of outpatient treatment units' is included in the model, the sample reduces from 103 to 88 observations and estimates lose some degrees of freedom (i.e., that the model losses some explanatory model due to statistical limitations).

of economic deceleration or fall, spending on drug treatment tends to be severely affected. Therefore, we may conclude that spending on substance treatment in hospitals is exposed and affected by the economic cycle. This result is in line with other literature, which estimated the income elasticity of health expenditure (Newhouse, 1977 or Getzen 2000). The study from De la Maisonneuve and Oliveira Martins (2013) analyzing total public expenditure on health in OECD countries shows an income elasticity of 0.8 (as a central estimate with ranges varying between 0.6 and 1).

The coefficient associated to the number of new clients in opioid substitution treatment assesses the impact of the drug problem and awareness of this harm-reduction intervention (and also, simultaneously, the coverage of the drug treatment system) on hospital expenditure to treat drug use. EMCDDA (2018) last report shows that the use of opioids still accounts for much of the morbidity and mortality associated with drug use. Recently, Gryczynski et al (2016) found that people with a substance use disorder involving heroin and opioid analgesic misuse can be expected to experience an inpatient hospital stay in a course of the year. In the same line, opioids consumption is linked to prevalence of infectious diseases such as HIV, hepatitis or tuberculosis.

This study shows that the seriousness of the substance (drug and alcohol) problem is positively associated to spending on substance treatment in hospitals, as expected. The model concludes that mortality rates are positively correlated with hospital expenditures (and statistically significant) in all estimates. Expenditure on drug treatment in hospitals increases between 15% and 23% when drug-related mortality rises by one unit; and it rises by 14% to 16% when mortality is associated to alcohol.

Interestingly enough, an increasing provision of opioid substitution therapy (OST) declines drug treatment expenditure on hospitals. Estimates show that when the number of new clients in OST increases, hospital expenditure decreases by about approximately 1.7%. As EMCDDA reports (EMCDDA 2018), opioid substitution treatment is frequently not offered in hospitals. Therefore, the availability of this treatment replaces drug interventions in hospitals and, therefore, reduces drug-related expenditure in hospitals. These results show the importance of OST to reduce drug and alcohol related harms (for example, drug overdose) and to avoid hospital expenditures.

5. DISCUSSION

5.1. CONCLUSION

This study proposes a method and, using international datasets, estimates the spending on substance-related (alcohol and drugs) treatments in hospitals in Europe. Additionally, the study analyses what are the main factors which contribute to explain spending. In order to do so, this study proposes a set of explanatory factors. These are based on a pragmatic approach. The explanatory model is guided by two types of considerations. First, by the theoretical framework commonly applied to explain spending on health services and; second, by a pragmatic application of models based on the best data available.

Taking these considerations into account, first, this study estimates time trends in substance (alcohol and illicit drugs) treatment in hospitals, over the 2005-2015

period, in 19 European countries. First, it concludes that while the number of people in alcohol treatment in hospitals (when measured by the number of patient discharges) fell, the number of alcohol bed days increased, suggesting that less people were treated for alcohol but their treatment lasted longer. Drug treatment time trends differed. The number of people treated for drugs in hospitals (measured by hospital discharges) increased over the decade and so did their length of stay in hospitals.

If the analysis focuses on the year of 2015, data are available for 24 European countries. These countries would represent 83% of the European Union population and XX% of the EU(28) GDP. In that year, alcohol-related diagnoses represented between 0.03% and 1.8% of total first diagnoses in hospitals and, the average length of in-patient treatment ranged from 2.8 to 34.2 days. Drug use was the first diagnosis reported in less than 0.1% of cases and the length of stay in hospitals varied between 3 to 39 days. In both cases it may suggest that the type of problems and treatments offered varied considerably from country to country. Additional information is required regarding the types of treatment provided in hospitals and diagnoses associated to substance abuse in order to better explain this result.

This study then estimated what each country spent to treat these hospital interventions. In 2015, 24 European countries allocated 0.5% of their total health expenditure to treat alcohol as first diagnosis in hospitals. Expenditure to treat drug diagnoses ranged close to 0.28%-0.29% of total health expenditure on hospitals. Per capita, the average expenditure on the treatment of alcohol episodes varied between EUR 18.6 – EUR 17.6; while between EUR 14.4 –EUR 13.5 were spent on treating drug episodes. Over a twoyear period (2013-2015), for the group of 24

countries, hospital expenditure on the treatment of drug use as first diagnosis increased more than spending on alcohol diagnosis (15% and 8% respectively). At country level, the results show a huge variation in the spending on hospital drug and alcohol treatments. The drug situation and the provision of health care organization could explain part of these differences, as we may see below.

Grouping countries by the proportion of health care that publicly financed, we may conclude that countries where over than 80% of total national expenditure on health is public financing, tend to spend more on the treatment of substance abuse – both alcohol and drug diagnoses in hospitals¹².

This study performed a panel data analysis to explain expenditure on drug and alcohol treatment in hospitals, in the European countries. Variables such as national income or the associated mortality were included. The panel data regressions confirmed that overall public expenditure is positively related to both the hospital expenditure on drug and alcohol treatments. Furthermore, increasing GDP (per capita) is also associated with increasing substance-related spending on hospitals. Therefore, we may conclude that the overall socio- economic situation of each country and the overall 'generosity' of public sectors contribute to more spending on the treatment of substance abuse diagnosis in hospitals.

By comparison, the study that most resembles to this one is the Lievens et al. (2014). These authors only made estimates for total spent and overall, confirm almost comparable results. These authors estimated public expenditures on treatments of

¹² Outcome variables are not available in order to assess if these treatment are cost-efficient, though.

illegal drugs and alcohol in hospitals, in 21 EU member states, in 2010. Authors used data from EUROSTAT and a top-down approach. Considering that the sample of countries is slightly different and they excluded private spending, any comparison should be made with caution. In their study, total hospital spending on alcohol and drug treatments was estimated at EUR 6,693 million (2015 prices). Hospital expenditures for alcohol treatments represented 77.7% of total expenditures for substance (alcohol and drugs) treatment in hospitals (64.3% in our study).

In Lievens et al. (2010), hospital expenditure on alcohol treatments was estimated at EUR 14.5, per capita, in the EU-21 (compared to EUR 18.6, per capita, in this study, at 2015). Lievens et al. (2010) estimated that expenditure on drug treatments was EUR 4.12 per capita, in 2010 at 2015 prices, (compared to EUR 14.4 per capita in this study, 2015). These differences could be explained by the different sample of countries: the inclusion of Switzerland and Norway in our estimates. If these countries are not taken into account in the estimates, the average hospital expenditure per capita would be EUR 12.2 and EUR 5.8, for alcohol treatments and drug treatment, respectively.

Lievens et al. applied a model with simple correlations to explain public spending on substance abuse treatments. They found a strong positive correlation between GDP per capita and public expenditures on hospitals per day (as our study does). These authors have found no positive correlation between prevalence of drug and alcohol problems with hospital expenditure.

The current study attempted to go one step further. The current study made an econometric analysis to explain spending on drug and alcohol treatments in hospitals. Using the number of substance-related deaths as a proxy for the dimension of the substance (alcohol and alcohol) use problem, analysis confirms that the epidemic situation observed impacts as expected in the spending on treatment: the worse the situation is and more people deaths are related to substance abuse, the more expenditure is allocated to substance treatment in hospitals.

It should be noted however, that drug-related deaths were used to assess the size and seriousness of the drug use situation in a country because there were no data available on alcohol and drug prevalence neither for problem substance (alcohol and drug) use in a significant number of countries. However, comparable data are not available for a sufficient number of countries and, therefore, panel data analysis would be reliable otherwise.

This model sustains that the economic situation of a country impacts positively in the expending on the treatment of substance abuse. This conclusion confirms the Prieto (2010) study. Countries benefitting from higher GDP growth rates, per capita, spend more on substance treatment, in hospitals.

Additionally, this study concludes that the organization of treatment services impacts on health expenditure, i.e., that an increasing public financing of health provision is positively correlated with higher spending on substance (alcohol and drugs) treatment in hospitals. In another words, when national health provision is mostly financed by the public sector, more money tend to be allocated to substance treatment in hospitals. Notice however, that at this stage, this model does not make any cost-effectiveness analysis.

Additionally, this study concludes also that potential alternatives to substance treatment in hospitals, such as outpatient or/and opioid substitution treatment, impact negatively on the spending on substance abuse treatment in hospitals, as expected. In fact, these treatments may constitute alternatives to types of treatments provided in hospitals and, therefore, substitute substance treatment in hospitals.

5.2. METHODOLOGICAL CONSIDERATIONS AND LIMITATIONS

First, the unavailability of data for spending on substance treatment on other settings than hospitals limits the representativeness of this analysis, when one wants to have a complete estimate of spending on substance treatment in Europe. This analysis would be much enriched if data were available for specific expenditure on substance treatments provided in other settings.

Second, the data currently available for making international comparisons imposes several limitations. Data for health expenditure on hospitals are missing in some countries and for some years. Additionally, to the data for health expenditure is classified according to a system (the SHA) which is not fully comparable with health activity data, frequently published according to the ICD classification system¹³. The ICD is the foundation for the identification of health trends and statistics globally, and the most commonly used international standard for reporting diseases and health conditions. Estimates would improve if expenditure data were classified according to the ICD codes.

Nevertheless, the data used in this study comply with the System of Health Accounts (SHA), published by the OECD. The SHA is an international recognized classification system that gathers harmonized international data on health expenditure, guaranteeing across countries comparability and articulated with activity data.

The second characteristic that may constitute a limitation is that it adopted a top-down approach. Top-down approaches base estimates on attributable-fractions and underlying criteria. Commonly, the criteria lay down for estimating attributable-fractions do not take into account all of the characteristics that may impact on total costs and, therefore, may result in oversimplified cost functions. For instance, the model estimated in this study assumes that unit costs are the same for all stays at the hospital, for patients treated for drug or alcohol use. This simplifying assumption reduces precision of estimates. Nevertheless, the level of precision required in the estimates of hospital expenditure may depend on the objectives of the study. In this sense, economic evaluations comparing different therapeutic alternatives, or prospective clinical studies, may have to undertake more precise estimates, and be based on a micro-costing approach (Drummond et al, 2015). This study, as said, does not make cost-effective analysis and aims to estimate expenditure mainly for understanding their size, and second to understand what their main forces are.

Thirdly, this study has only accounted for expenditure to finance the substance treatment when substance use was registered as first diagnosis, excluding registers and, therefore, expenditure when drug and alcohol-related treatment were registered as second diagnosis. This decision has been taken because it is difficult to attribute a reliable proportion of expending under the responsibility of alcohol and drug use, in cases where this diagnosis are not the main cause of the spending. Which proportion of the medical expenditure is attributable to the first diagnosis and which

¹³ See <https://icd.who.int/>.

proportion is attributable to drugs or alcohol use? There are no scientific guidelines or data coupled with objective criteria which permits adopting acceptable methods for disentangling expenditure. Therefore, the existing literature tends to account only with expenditure made to pay for the treatments of first diagnosis. This limitation leads to an underestimation of costs of treating substance use (both alcohol and drug related use) in hospitals.

Fourthly, in the panel data estimating approach, it is difficult to assess if all relevant explanatory variables are included in estimates and what is the weight of missing – and relevant– explanatory variables. This model does not consider, for example, rules and laws to control substance supply and demand (for instance, restrictiveness of police control measures on drug illicit supply or alcohol taxation), nor characteristics such as the supply of treatment in prisons hospitals, among others factors (EMCDDA, 2011).

In particular it has to be noted that, despite longitudinal data for expenditure on preventive care, mental health facilities, or the prevalence of substance use, among others, had been introduced in a previous step into the models, the scarcity of data availability restricted seriously the sample and the reliability of results. Therefore, authors decided to exclude these variables in order to increase robustness of results.

5.3. IMPLICATIONS FOR PUBLIC HEALTH POLICY

The first conclusion is that expenditure on the treatment of alcohol is higher than the expenditure of treating substance abuse in hospitals. As previously described, for instance, in 2015 with data available for 24 European countries, estimates suggest that countries spent 0.5% of their total health expenditure in hospitals on the treatment of alcohol as first diagnosis. Spending to treat drug diagnosis ranged between 0.28% and 0.29% of the total. An obvious reason to explain higher spending on alcohol treatment than on illicit drug use treatment is the number of patients treated. The number of alcohol use diagnosis is higher than diagnosis associated to the use of illicit drugs. Data show that, in 2015, alcohol diagnosis represented between 0.03% and 1.8% of total first diagnosis treated in hospitals (with an average length of in-patient treatment ranging between 2.8 to 34.2 days). The number of patients treated for drug use (as the first diagnosis) was inferior to 0.1% of cases (a length of stay in hospitals varied between 3 to 39 days).

This conclusion is widely corroborated by literature on the costs of substance use (Kopp, 2015, Lievens et al, Rehm et al., 2006; Potapchik, E. and Popovich 2014). Again, these results are partly explained by the size of the population affected by an alcohol problem being larger than the size of the population using drugs and; consequently, the population in need of treatment is also correspondingly larger.

The size of alcohol and illicit drugs populations and their social burdens has been estimated by Peacock et al. (2017). Their study, on the global statistics of alcohol, tobacco and illicit drugs, shows that in 2015 alcohol and tobacco use cost the society more than a quarter of a billion disability-adjusted life years, with illicit drugs costing only a further tens of millions. In fact, these authors estimated that prevalence among the world adult population was 18.3% for heavy episodic alcohol use (in the past 30 days); 15.2% for daily tobacco smoking; and 3.8%, 0.77%, 0.37%, and 0.35% for past-year cannabis, amphetamine, opioid, and cocaine use, respectively, in 2015. Concerning heavy episodic, European regions had the highest prevalence. These authors estimate that, in 2015, age-standardised prevalence of alcohol dependence

was 843.2 per 100,000 people; compared to 259.3 per 100,000 people for cannabis, 220.4 per 100,000 people for opioids, 86.0 per 100,000 people for amphetamines and 52.5 per 100,000 people for cocaine dependence.

Since the size of populations that use addictive substances results from multiple factors, as diverse as local, for instance, cultural traditions or socio-economic characteristics of societies; the legal framework applied to substance supply and use may constitute an element to take into consideration, especially because it is a powerful tool available to Governments. Such a tool can be used having short and long term effect. Studies corroborate the impact that legal framework may have on variables such as the age of initiation of substance use and their risk perceptions. Less legal deterrents to substance use may be perceived as signals of their reduced harms on public and individual health and, therefore, may tend to increase the amounts of substances consumed over time.

The type of problems and treatments offered for both alcohol and drug diagnosis varied considerably from country to country and, this study recognizes the need of systematic additional information, compiled in a comparable manner, to fully describe and characterize the types of specific treatment provided according to the substance used, data on diverse types of costs of treatment provided classified, for instance, by substance or drug used; in order to better explain results.

Another important consideration is that spending in hospitals is very associated to drug related deaths. Therefore, even without having specific information on the specific types of treatment, it is visible that these treatments have a short length (close to one month), and are associated to drug-related deaths. Therefore, it is fair to assume that when patients are treated in hospitals it is because they are experiencing the consequences of problematic substance use. These harms should have been avoided with previous resource to other therapies in other settings. Therefore, in a perfect world, we might be led to conclude that substance treatments provided in hospital are a treatment of last resort which should be avoided. Studies from other health fields have concluded that the use of ambulatory care would lead to better patient care and case management, and a reduction in avoidable emergency admissions, which are costly and expose patients to otherwise avoidable clinical risks (NHS Digital, 2018 or Tian and al., 2012) In order to be fully conclusive, this analysis should be completed with a cost-effectiveness analysis, i.e., an analysis whereas the spending in hospitals treatment would be compared to its benefits (value of avoided deaths, for instance) and, last but not the least, to the spending and benefits of alternative settings/types of substance treatment.

In this framework, we might conclude that estimates for the expenditure on substance use treatment in hospitals are an indispensable step to evaluate interventions and should contribute for improving the decision making process of health providers. This is especially true if countries are experiencing austerity situations and Governments are called to implement reorganization or cuts in the provision of health care. But it is also true, if health providers want to make regular the policy evaluation exercises. In fact, since one third of total health care expenditure is spent in hospitals, in the OECD countries, the analysis of expenditure and, its cost-effectiveness, by diagnosis and type of treatment provided should be relevant (OECD, 2015). Estimating the money spent in hospitals is an input of cost-effectiveness analysis. These estimates may permit establishing a relationship between care provided in other settings and hospital expenditures on treatment of

drug and alcohol diagnosis, helping policy makers to weighting priorities and allocating resources. This is an example of a crucial decision in allocating health care resources to substance problem. In fact, policy makers can get the highest increases in health expenditures efficiency reallocating resources at an aggregated level of health care (Lorenzoni and Marino, 2017).

A second application of this study is to permit quantifying the potential economic returns achieved by effective policies that reduce demand for substance use in hospitals. This fall in hospital interventions may be due to a reduction in the overall prevalence of substance use or by better access to other types of treatment that replace hospitals.

In the future, efforts should focus on improving data availability and detail. For instance, developing a consistent methodology to gather data on expenditure at more detailed level and classified by ICD codes, for instance. This, would improve accuracy of estimates; increase their utility and better support policy formulation. Last but not least, would allow comparing expenditures across countries.

REFERENCES

- BUSSE, R., SCHREYÖGG, J., AND SMITH, P (2008). Analysing the variation of health care treatment costs in Europe. *Health Economics*, 17(S1), S1-S104.
- BYRNE, S. (2010) *Costs to Society of Problem Alcohol Use in Ireland*. Dublin: Health Service Executive
- COLLINS, D., & LAPSLEY, H. M. (2008). *The costs of tobacco, alcohol and illicit drug abuse to Australian society in 2004/05*. Canberra: Department of Health and Ageing.
- COST F., CHIARELLO P., SALVADOR X., CASTELLS X AND QUENTIN W (2011). *DRG-based hospital payment: intended and unintended consequences, in Diagnosis-related groups in Europe: moving towards transparency, efficiency and quality in hospitals*, ed. By Busse R., Geissler A., Quentin W. and Wiley M., Mc Graw Hill Open University Press, USA
- CULYER, A. J. (1988). *Health care expenditures in Canada: myth and reality, past and future* (No. 82). Canadian Tax Foundation.
- DRUMMOND, M. F., SCULPHER, M. J., CLAXTON, K., STODDART, G. L., & TORRANCE, G. W. (2015). *Methods for the economic evaluation of health care programmes*. Oxford university press.
- European Association for Injury Prevention and Safety Promotion - Eurosafe (2016). *Injuries in the European Union*, Summary on injury statistics 2012-2014, Amsterdam 2016.
- European Monitoring Centre for Drugs and Drug Addiction (2008). *Towards a better understanding of drug-related public expenditure in Europe*. Office for Official Publications of the European Communities, European Monitoring Centre for Drugs and Drug Addiction, Printed in Belgium.
- European Monitoring Centre for Drugs and Drug Addiction (2011). *Cost and financing of drug treatment services in Europe*, Selected issue. Office for Official Publications of the European Communities, European Monitoring Centre for Drugs and Drug Addiction, Printed in Belgium.
- European Monitoring Centre for Drugs and Drug Addiction (2017). *Drug treatment expenditure: a methodological overview*, EMCDDA Insights 24, Publications Office of the European Union, Luxembourg.
- European Monitoring Centre for Drugs and Drug Addiction (2017a). *European Facility Survey Questionnaire*, March 2017.
- European Monitoring Centre for Drugs and Drug Addiction (2018). *European Drug Report 2018: Trends and Developments*, Publications Office of the European Union, Luxembourg.

- European Monitoring Centre for Drugs and Drug Addiction (2018a). <http://www.emcdda.europa.eu/data/stats2018/tdi>, consulted 30 August, 2018.
- Eurostat (2016). HEDIC: *Health expenditure by diseases and conditions*, 2016 edition, Statistical working papers, Luxembourg Publications Office of the European Union
- GETZEN, T.E., 2000. Health care is an individual necessity and a national luxury: applying multilevel decision models to the analysis of health care expenditures. *Journal of Health Economics*, 19(2), pp.259-270.
- GONÇALVES, R., LOURENÇO, A., & DA SILVA, S. N. (2015). A social cost perspective in the wake of the Portuguese strategy for the fight against drugs. *International Journal of Drug Policy*, 26(2), 199- 209.
- GRYCZYNSKI, J., SCHWARTZ, R. P., O'GRADY, K. E., RESTIVO, L., MITCHELL, S. G., & JAFFE, J. H. (2016). Understanding patterns of high-cost health care use across different substance user groups. *Health Affairs*, 35(1), 12-19.
- HITIRIS, T., & POSNETT, J. (1992). The determinants and effects of health expenditure in developed countries. *Journal of Health Economics*, 11(2), 173-181.
- HSU, D. J., MCCARTHY, E. P., STEVENS, J. P., & MUKAMAL, K. J. (2017). Hospitalizations, costs and outcomes associated with heroin and prescription opioid overdoses in the United States 2001– 12. *Addiction*, 112(9), 1558-1564.
- FARAG, M., NANDAKUMAR, A. K., WALLACK, S., HODGKIN, D., GAUMER, G., & ERBIL, C. (2012). The income elasticity of health care spending in developing and developed countries. *International Journal of Health Care Finance and Economics*, 12(2), 145-162.
- JARL, J., JOHANSSON, P., ERIKSSON, A., ERIKSSON, M., GERDTHAM, U. G., HEMSTRÖM, Ö., ... & ROOM, R. (2008). The societal cost of alcohol consumption: an estimation of the economic and human cost including health effects in Sweden, 2002. *The European Journal of Health Economics*, 9(4), 351-360
- KE, X., SAKSENA, P., & HOLLY, A. (2011). *The determinants of health expenditure: a country-level panel data analysis*. Geneva: World Health Organization, 26.
- KOPP P., 2015, The social cost of drugs in France, OFDT, Memo 2015-04, Saint-Denis, 10 September 2015
- LIEVENS, D., VANDER LAENEN, F., & CHRISTIAENS, J. (2014). Public spending for illegal drug and alcohol treatment in hospitals: an EU cross-country comparison. *Substance Abuse Treatment, Prevention, and Policy*, 9(1), 26.
- LIEVENS D., VANDER LAENEN F., VERHAEGHE N., SCHILS N., PUTMAN K., PAUWELS L., HARDYNS W., ANNEMANS L. (2016) The social cosys of legal and illegal drugs in Belgium, IRCP research series, Maklu, Antwerpen
- LIEVENS, D., VANDER LAENEN, F., VERHAEGHE, N., PUTMAN, K., PAUWELS, L., HARDYNS, W., & ANNEMANS, L. (2017). Economic consequences of legal and illegal drugs: the case of social costs in Belgium. *International Journal of Drug Policy*, 44, 50-57.
- LORENZONI, L., & MARINO, A. (2017). *Understanding variations in hospital length of stay and cost*. OECD health working paper n° 94.
- NHS Digital, 2018, Unplanned Hospitalisation for Chronic Ambulatory Care Sensitive Conditions (IAP00068) <https://digital.nhs.uk/data-and-information/national-indicator-library/unplanned-hospitalisation-for-chronic-ambulatory-care-sensitive-conditions>
- OECD (2015). *Health at a Glance*. OECD Publishing, Paris. http://dx.doi.org/10.1787/health_glance-2015-en
- OECD (2015). *Tackling harmful alcohol use: economics and public health policy*, OECD Publishing. <http://dx.doi.org/10.1787/97892641181069-en>
- OECD (2016). *Focus on Health Spending: expenditure by disease, age and gender*, April 2016

- OECD (2018), Health Care Utilisation Database, https://stats.oecd.org/OECDStat_Metadata/ShowMetadata.ashx?Dataset=HEALTH_PROC&ShowOnWeb=true&Lang=en, consulted August 2018.
- OECD, Eurostat and WHO (2011). *A System of Health Accounts: 2011 edition*, OECD Publishing, Paris.
- NEWHOUSE, J.P., 1977. Medical-care expenditure: a cross-national survey. *The Journal of Human Resources*, 12(1), pp.115-125.
- NIGROVIC, L. E., & CHIANG, V. W. (2000). Cost analysis of enteroviral polymerase chain reaction in infants with fever and cerebrospinal fluid pleocytosis. *Archives of Pediatrics & Adolescent Medicine*, 154(8), 817-821.
- PEACOCK AMY, LEUNG J., LARNEY S., COLLEDGE S., HICKMAN ., REHM J., GIOVINO G., WEST R. , HALL W., GRIFFITHS P., ALI R., GOWING L., MARSDEN J., FERRARI A., GREBELY J., FARRELL M., DEGENHARDT L. (2018), Global statistics on alcohol, tobacco and illicit drug use: 2017 status report, *Addiction*, 113, 1905-1926.
- POTAPCHIK, E. AND POPOVICH L., (2014), Social Cost of Substance Abuse in Russia, *Value in Health regional issues* 4c(2014) 1-5;
- PRIETO L. (2010). Labelled drug-related public expenditure in relation to gross domestic product (GDP) in Europe: a luxury good?. *Substance Abuse Treat Prev Policy*. 2010 May 17;5:9. doi: 10.1186/1747-597X-5-9.
- REHM J., BALLUNAS D., BROCHU S., FISCHER B., GNAM W., PATRA J., POPVA S., SARNOCINSKA-HART A., TAYLOR B. 2006, The cost of substance abuse in Canada 2002, *CCSA*.
- RITTER, A., CHALMERS, J., & BERENDS, L. (2015). Health expenditure on alcohol and other drug treatment in Australia (2012/2013). *Drug and Alcohol Review*, 34(4), 397-403.
- RIVERA, B., CASAL, B., & CURRAIS, L. (2017). The social cost of illicit drugs use in Spain. *International Journal of Drug Policy*, 44, 92-104.
- SANTORA, P. B., & HUTTON, H. E. (2008). Longitudinal trends in hospital admissions with co- occurring alcohol/drug diagnoses, 1994–2002. *Journal of Substance Abuse Treatment*, 35(1), 1- 12.
- SLACK, A., Business and Economic Research Limited (BERL), & et al. (2009). *Costs of harmful and alcohol and other drug use*. BERL economics.
- Scottish Government. (2008). *Costs of Alcohol Use and Misuse in Scotland*.
- TAIRA, D. A., SETO, T. B., SIEGRIST, R., COSGROVE, R., BEREZIN, R., & COHEN, D. J. (2003). Comparison of analytic approaches for the economic evaluation of new technologies alongside multicenter clinical trials. *American Heart Journal*, 145(3), 452-458.
- TIAN Y., DIXON A. AND GAO H, 2012, Emergency hospital admissions for ambulatory care-sensitive conditions: identifying the potential for reductions, The King's Fund 2009, 2012 https://www.kingsfund.org.uk/sites/default/files/field/field_publication_file/data-briefing-emergency-hospital-admissions-for-ambulatory-care-sensitive-conditions-apr-2012.pdf
- United States Department Of Justice (2011): *Economic Impact of Illicit Drug Use on American Society*. United States Department of Justice. Washington DC.
- VAN DER GAAG, J., & ŠTIMAC, V. (2008). *Towards a new paradigm for health sector development*. Amsterdam Institute for International Development.
- VERHAEGHE, N., LIEVENS, D., ANNEMANS, L., VANDER LAENEN, F., & PUTMAN, K. (2017). The health- related social costs of alcohol in Belgium. *BMC Public Health*, 17(1), 958.
- WAGSTAFF, A. (2009). *Social health insurance vs. tax-financed health systems-evidence from the OECD*. The World Bank.
- WHITE, A. M., HINGSON, R. W., PAN, I. J., & YI, H. Y. (2011). Hospitalizations for alcohol and drug overdoses in young adults ages 18–24 in the United States, 1999–2008: results from

the Nationwide Inpatient Sample. *Journal of Studies on Alcohol and Drugs*, 72(5), 774-786.
 YOUNG, M. M., & JESSEMAN, R. J. (2014). *The impact of substance use disorders on hospital use*. Ottawa, ON: Canadian Centre on Substance Abuse.

Annex 1. Output of the literature review, overview of studies considered

AUTHOR AND YEAR OF PUBLICATION	COUNTRY	TIME PERIOD	STUDY PERSPECTIVE	SUBSTANCE/DIAGNOSE	COSTING METHOD	METHOD TO ESTIMATE HOSPITAL COSTS
Collins and Lapsley (2008)	Australia	2004-2005	Society	Tobacco, alcohol and illicit drug abuse	Case-Mix Group	The cost of hospitalisation due to drug abuse was determined from the Australian National DRGs and the National Hospital Costing Data.
Jarl et al (2008)	Sweden	2002	Society	Alcohol	Case-Mix Group	The disease-specific costs for inpatient care were based on 2 different inpatient registers. Each care episode was valued by a DRG-based administrative process resulting in weighted costs.
Santora and Hutton (2008)	USA	1994-2002	Health system - Hospitals	Co-occurring diagnosis: Alcohol/drug abuse and addiction with other medical diagnoses	Micro-Costing	Charges per admission were adjusted to produce costs incurred by the hospital.
Scottish Government (2008)	Scotland	2005/2006	Society	Diagnosis attributable to alcohol	Average per Diem	The average cost of a bed day was calculated from the Scottish Health Service Costs data (£374 for an acute bed and £259 for psychiatric).
Slack et al (2009)	New Zealand	2005-2006	Society	Alcohol and other drugs (illegal and misused legal drugs)	Case-Mix Group	Hospital costs were calculated using hospital discharges. Each discharge has a case-weight, attributed accordingly to its therapeutic complexity. Attributable fractions were applied to case-weights. The annual average cost of a case was applied to these numbers.

Byrne (2010)	Ireland	2007	Society	Alcohol related illnesses	Average per Diem	Alcohol attributable hospitalizations were applied to estimate the proportion of costs of hospital care attributable to the alcohol disease.
US Department of Justice (2011)	USA	2007	Society	Illicit drugs	Cost Per Event	The drug use attributable fraction is a proportion of the number of hospital cases with an indication of illicit drug use in the total hospital cases. Cost per event is applied based on hospital data.
White et al (2011)	USA	1999-2008	Health system - Hospitals	Diagnosis of poisoning and nondependent abuse of alcohol and drugs in patients ages 18-24 (drugs and alcohol overdoses)	Micro-Costing	Hospital charges indicated in discharge records and the cost-to-charge ratios developed by the Healthcare Cost and Utilization Project (HCUP).
Lievens et al (2014)	21 EU member states	2010	Health system - Hospitals	Primary diagnosis of mental and behavioral disorders due to psychoactive substance use or alcohol use	Average per Diem	Average cost per hospital day is calculated by dividing the total public expenditure on health hospitals by the total number of days in hospital for treating all causes of diseases.
Young and Jesseman	Canada	2006-2012	Health system - Hospitals	Diagnosis of mental and behavioral disorders due to psychoactive substance use or alcohol use	Case-Mix Group	Cost per 'Weighted Case' indicator (Case Mix Groups).
Gonçalves et al (2015)	Portugal	1999-2010	Society	Pathologies included in the Major Diagnostic Categories (MDC) number seven ('Hepatobiliary System And Pancreas', which includes hepatitis) and twenty-five ('HIV infection')	Case-Mix Group	Number of hospital episodes for Diagnosis-Related Groups (DRG). Payment per episode received by hospitals in that same year as a proxy for each episode's treatment costs.

Ritter et al (2015)	Australia	2012-2013	Health system	Alcohol and other drugs treatment	Case-Mix Group	Costs were calculated using DRGs.
Hsu et al (2017)	USA	2001-2012	Health system - Hospitals	Diagnosis of heroin or opioid overdose using	Micro-Costing	Total hospital costs were calculated by converting total hospital charges to costs using the HCUP cost-to-charge ratio, which is based on hospital account reports.
Lievens et al (2017)	Belgium	2012	Society	Alcohol, tobacco, illegal drugs and psychoactive medication	Disease-Specific	The hospital costs were calculated by multiplying the age- and gender-specific substance-attributable fractions (SAFs), the number of (age and gender-specific) hospital care episodes and the weighted average disease-specific unit costs.
Rivera et al (2017)	Spain	2012	Society	Illicit drugs	Case-Mix Group	Discharges are valued using Diagnosis-Related Groups (DRG).
Verhaeghe et al. (2017)	Belgium	2012	Society	Diseases known to be causally related to	Disease-Specific	Costs were calculated by multiplying specific alcohol-attributable fractions by the number of age- and sex-specific.

Annex II – Data limitations and breaks in time series

Country	Limitations
Ireland	<ul style="list-style-type: none"> – Database does not include private hospitals – A small number of non-acute hospitals are included. – Data for Psychiatric inpatients and day-cases receiving curative and rehabilitative care in specialist psychiatric hospitals (HP.1.2) have not been included.
France	<ul style="list-style-type: none"> – Excluded long term care hospitals and nursing facilities – Psychiatric hospitals and post-acute or rehabilitation hospitals have been excluded until 2015 and army hospitals until 2008.
Italy	<ul style="list-style-type: none"> – Military hospitals are not included. – Psychiatric hospitals and Substance abuse hospitals do not exist in Italy.
Cyprus	<ul style="list-style-type: none"> – Database covers only discharges from the public sector medical institutions.
Latvia	<ul style="list-style-type: none"> – Whilst hospitals have not concluded an agreement with the National Health Service, data of all discharged inpatients are not available.
Lithuania	<ul style="list-style-type: none"> – Database does not include data of 5 budget financed drug and alcohol abuse hospitals, prison hospital; database partly includes data of hospital of the Ministry of Interior and private hospitals.
Netherlands	<ul style="list-style-type: none"> – HP.1.2 category is not included. Database does also not cover some hospitals of the HP.1.3 category. – Database also exclude military hospital and private clinics. – Part-time psychiatric treatments in category HP.1. hospitals are excluded.
Poland	<ul style="list-style-type: none"> – Military and Ministry of Internal Affairs hospitals are not included.
Norway	<ul style="list-style-type: none"> – Private financed activity in private hospitals are not included. – From 2011: Covers all governmental financed bed-days in general hospitals (HP.1.1; HP.1.2 and HP.1.3) – Up to 2010: Only general hospitals are covered.
Switzerland	<ul style="list-style-type: none"> – Military and prison hospitals are not included.

INCORPORACIÓN DEL FACTOR MEMORIA EN EL MODELO DE CUATRO FACTORES DE FAMA Y FRENCH

MARÍA DE LAS NIEVES LÓPEZ GARCÍA

Departamento de Economía y Empresa/Universidad de Almería
Carretera Sacramento s/n 04120/marian00lg@hotmail.es

JUAN EVANGELISTA TRINIDAD SEGOVIA

Departamento de Economía y Empresa/Universidad de Almería
Carretera Sacramento s/n 04120/jetrini@ual.es

MIGUEL ÁNGEL SÁNCHEZ GRANERO

Departamento de Matemáticas/Universidad de Almería
v Carretera Sacramento s/n 04120/misanche@ual.es

e-mail María de las Nieves López García: marian00lg@hotmail.es

Resumen

El objetivo del trabajo es la incorporación del factor memoria en el modelo de Fama y French, a través del Exponente de Hurst, haciendo uso de dos métodos de cálculo diferentes, HFD4 y HP. Comprobaremos cuál de los dos métodos de cálculo ofrece más información dentro del modelo factorial usando una muestra de 2.500 acciones, dentro del periodo 2012-2016.

Palabras clave: Factor, Hurst, memoria, Fama y French, HFD4, HP.

Abstract

The objective of the work is the incorporation of the memory factor in the Fama and French model, through the Hurst Exponent, making use of two different calculation methods, HFD4 and HP. We will check which of the two calculation methods offers more information within the factorial model using a sample of 2,500 actions, within the 2012-2016 period.

Key Words: Factor, Hurst, memory, Fama y French, HFD4, HP.

Área o eje Temático 9:

Economía Cuantitativa. Para la Economía y la Empresa

1. INTRODUCCIÓN

Desde los inicios de la teoría de carteras con Markowitz (1952) han sido muchos los autores que han centrado sus esfuerzos en entender el comportamiento de los rendimientos y los precios del mercado. Sobre esta línea de investigación, algunos autores han intentado encontrar una función de distribución que se ajuste a las rentabilidades de los mercados financieros, y otros se han centrado en la búsqueda de relaciones entre el riesgo y el rendimiento o en buscar cuáles son las mejores variables explicativas de los retornos de las acciones.

El primer gran paso en esta última línea de investigación lo dio Sharpe (1964) con el desarrollo de su modelo de un solo Índice o también conocido como modelo Diagonal, el cual perseguía solucionar el problema en la estimación de la matriz de covarianzas que tanto complicaba el cálculo del modelo de Markowitz. Posteriormente los trabajos de Lintner (1965), Mossin (1966) y Black & Scholes (1973) crearon el conocido modelo Capital Asset Pricing Model (CAPM).

La contribución del CAPM a las finanzas fue el de asociar el rendimiento de un activo financiero a su riesgo sistemático, el cual es medido mediante la Beta. Sus implicaciones son que cualquier cartera es eficiente en el sentido de Markowitz, lo que se traduce por una parte en que el rendimiento de un activo es una función lineal de su Beta de mercado y, por otra parte, que esta Beta describe de forma adecuada su rendimiento.

Pese a que Black (1972) y posteriormente Fama & MacBeth (1973) probaron que el CAPM era un modelo válido para la determinación del rendimiento de empresas cotizadas con anterioridad a 1969, las primeras dificultades empíricas no tardaron en aparecer. Reinganum (1981) y Lakonishok & Shapiro (1986) encontraron las primeras anomalías del CAPM para la estimación de la rentabilidad del mercado en el periodo 1964-1990 y más tarde, Fama & French (1993) para el periodo 1941-1990. Las principales razones por lo que se piensa que el modelo no es válido, es que existen uno o varios factores adicionales que son relevantes para la determinación del rendimiento de los activos.

Bajo esta línea de pensamiento surgieron diversos trabajos como el de Banz en 1981, donde destaca el efecto tamaño como una variable clave para el estudio de la rentabilidad. Bhandari (1988) demostró la relación positiva entre el apalancamiento y el rendimiento de una cotizada., Stattman (1980), Rosenberg, Reid, & Lanstein (1985) y Chan, Hamao, & Lakonishok (1991) destacaron la importancia del Book to Market en la determinación de los rendimientos.

Fama y French propusieron un modelo factorial, compuesto a partir de los factores que han considerado como los más necesarios para explicar los retornos medios de las acciones, la capitalización, el Book to Market y el CAPM.

En este trabajo proponemos incluir el factor memoria medido a través del exponente de Hurst, como variable explicativa de la rentabilidad esperada de los activos. Este exponente cuanta con diversas metodologías de cálculo; en este trabajo usaremos dos métodos diferentes, el HFD4 y HP, con el propósito de comprobar que método da mejores resultados en el estudio.

2. BASE TEÓRICA

2.1. MODELO FACTORIAL DE FAMA Y FRENCH

Según el modelo CAPM, el rendimiento medio de las acciones puede describirse como una función lineal creciente de su beta de mercado:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \quad (2.1)$$

Donde, R_{it} es el rendimiento de la acción "i" para un periodo de tiempo "t"; R_{mt} es el rendimiento del mercado, representado generalmente a través de un índice o por el valor ponderado de una cartera; ϵ_{it} es el valor residual medio.

Si en (2.1) introducimos la rentabilidad del activo libre de riesgo, denominada R_f , la ecuación del CAPM se escribe de la siguiente forma:

$$R_{it} - R_f = \alpha_i + \beta_i (R_{mt} - R_f) + \epsilon_{it} \quad (2.2)$$

Donde $\beta_i (R_{mt} - R_f)$ es la prima de riesgo de mercado. La ecuación (2.2) recibe el nombre de Línea Característica del título y describe la relación entre la rentabilidad del activo "i" y el mercado.

Este modelo ha sido criticado por varios autores quienes han demostrado la insuficiente de Beta para predecir el retorno medio de las acciones para periodos posteriores a 1969 (Fama & French, 1993; Lakonishok & Shapiro, 1986; Reinganum, 1981). Uno de los principales motivos por los cuales el CAPM no es preciso en sus predicciones parece derivarse de la falta de factores explicativos dentro del modelo.

Basándose en las imperfecciones del CAPM, Fama & French (1993) proponen una extensión de (2.2) mediante la introducción de dos nuevos factores, capturando en el modelo la información recogida en el tamaño y en el valor de cada una de las acciones. El modelo empírico de fijación de precios de tres factores se define como:

$$R_{it} - R_f = \alpha_i + \beta_i (R_{mt} - R_f) + s_i SMB_t + h_i HML_t + \epsilon_{it} \quad (2.3)$$

Donde SMB_t es la diferencia entre el retorno medio de tres carteras de empresas pequeñas menos el retorno medio de carteras de empresas grandes; HML_t es la diferencia entre el retorno medio de dos carteras de empresas con alto valor menos el retorno medio de dos carteras de empresas de bajo valor.

Más adelante, el factor Momentum (Carhart, 1997) fue introducido en el modelo de tres factores (Fama & French, 2012). Los beneficios asociados en la utilización de este factor pueden derivarse de los problemas de especificación en los modelos de fijación de precios a causa de los ciclos económicos. El modelo de cuatro factores se define como:

$$R_{it} - R_f = \alpha_i + \beta_i (R_{mt} - R_f) + s_i SMB_t + h_i HML_t + w_i WML_t + \epsilon_{it} \quad (2.4)$$

Donde WML_t es la diferencia entre los retornos medio de tres carteras de empresas perdedoras menos el retorno promedio de tres carteras de empresas ganadoras.

Volviendo al modelo de tres factores, varios autores como Novy-Marx (2013); Titman, Wei, & Xie (2004), demostraron que era un modelo incompleto al no tener en cuenta gran parte de la variación de los rendimientos medios. En base a estas críticas Fama & French (2015) introdujeron en su modelo dos nuevos factores que aportan más información relevante en la estimación de los retornos medios.

$$R_{it} - R_f = \alpha_i + \beta_i (R_{mt} - R_f) + s_i SMB_t + h_i HML_t + r_i RMW_t + i_i CMA_t + \epsilon_{it} \quad (2.5)$$

Donde RMW_t es la diferencia entre los retornos de las carteras diversificadas con robustas y débiles rentabilidades y CMA_t es la diferencia entre los retornos de carteras diversificadas con altos y bajos niveles de inversión.

En general el modelo de cinco factores obtiene mejores resultados, pero aun se aprecia la incapacidad del modelo para capturar los pequeños rendimientos de las acciones de reducido tamaño cuyos rendimientos se comportan como el de las empresas que invierten mucho a pesar de la baja rentabilidad.

En este trabajo proponemos el uso del exponente de Hurst como un factor de memoria del mercado, mediante el uso de dos metodologías, HFD4 y HP. Para introducir estos nuevos factores en el modelo hemos creado las carteras con los retornos medios de las empresas con mayor exponente de Hurst que han obtenido una rentabilidad anual positiva menos las empresas con mayor exponente de Hurst que han obtenido una rentabilidad anual negativa.

3. EL EXPONENTE DE HURST COMO UN INDICADOR DE MEMORIA

El exponente de Hurst fue introducido por el hidrólogo inglés H.E. en Hurst (1951) para tratar el problema del control de los embalses cerca de la presa del río Nilo en base a la idea de que los fenómenos naturales muestran memoria.

En la geometría fractal, el exponente de Hurst ha sido definido por H o por H_q . Cuantifica la tendencia relativa de una serie temporal a regresar fuertemente a la media o agruparse en una dirección (Kleynow, 2002). Un valor H en el rango de $0.5 - 1$ indica una serie de tiempo con autocorrelación positiva a largo plazo, lo que significa que un valor alto en la serie probablemente será seguido por otro valor alto y que los valores durante un periodo de tiempo tenderán a ser altos. Un valor en el rango $0 - 0.5$ indica una serie de tiempo con conmutación a largo plazo entre valores altos y bajos en pares adyacentes, lo que significa que los valores tendrán tendencia a cambiar entre valores altos y bajos a lo largo del tiempo. Un valor $H = 0.5$ se asocia a una serie no correlacionada, pero de hecho es el valor aplicable a las series para las cuales las autocorrelaciones en pequeños retrasos de tiempo pueden iniciar una serie completamente no correlacionada, pero donde los valores absolutos de las autocorrelaciones disminuyen exponencialmente a cero. Esto contrasta con el decaimiento típico de la ley de potencia para los casos $0.5 < H < 1$ y $0 < H < 0.5$.

El método más popular para estimar el exponente de Hurst es el análisis R/S introducido por Hurst (1951). Sin embargo, autores como Couillard & Davison (2005), Lo (1989) o Weron (2002) y recientemente Sánchez-Granero, Trinidad-Segovia, & García-Pérez (2008) mostraron que el análisis R/S está sesgado cuando las series son demasiado cortas. La mejora en la estimación de H constituye una línea de investigación muy popular en la actualidad, pudiéndose citar como referentes los trabajos de Alessio, Carbone, Castelli, & Frappietro (2002), Barabasi & Vicsek (1991), Bensaïda (2014), Das & Das (2006), Fernández-Martínez, Sánchez-Granero, & Trinidad-Segovia (2013), Geweke & Porter Judak (1983), Hassler (1994), Kantelhardt et al. (2002), Monreal-Pérez, Aragón-Sánchez, & Sánchez-Marín (2012), Taqqu, Teverovsky, & Willinger (1995) o Veitch & Abry (1999) entre otros.

3.1. ALGORITMO HFD4

Desarrollados por Sanchez-Granero, Fernández-Martínez & Trinidad-Segovia (2015), su fundamento se basa en el concepto de dimensión fractal de una curva, previamente definido por Fernández-Martínez & Sánchez-Granero (2012). Los autores consideran la dimensión fractal como una generalización del Exponente de Hurst, cuya principal ventaja es que se puede calcular para una gama más amplia de movimientos y no necesariamente Brownianos. Los autores definen cuatro versiones del algoritmo FD, apareciendo las tres primeras en Sanchez-Granero, Fernández-Martínez, et al. (2015) y la última versión en Fernández-Martínez, Sánchez-Granero, Trinidad-Segovia & Román-Sánchez (2014) donde también se hace una reenfoque de los anteriores algoritmos FD. De esta forma, los autores indican que los algoritmos FD se calculan como sigue.

Denotemos por X a una variable aleatoria cuyo valor absoluto del momento de orden q th se define como $m_q(X) = E[X^q]$ y para cada $q > 0$ se puede obtener un valor esperado.

Así, sea X un proceso aleatorio con incrementos estacionarios y supongamos que existe un parámetro $H > 0$ tal que se cumple que $M(T, \omega) \sim T^H M(1, \omega)$.

De forma que si tomamos q -potencias en la ecuación anterior, entonces tenemos que:

$$M(T, \omega)^q \sim T^{qH} M(1, \omega)^q \quad (2.6)$$

para cada $q > 0$. Vamos a considerar $T_n = 1/2^n$ como una discretización razonable del periodo de tiempo T para todo $n \in N$. De esta forma:

$$M(T_n, \omega)^q \sim T_n^{qH} M(1, \omega)^q \quad (2.7)$$

para todo $q > 0$ y todo $n \in N$, de acuerdo con la ecuación (2.6). Así, si denotamos por X_n el rango acumulador del T_n -periodo del proceso aleatorio X , denominado, $X_n = M(T_n, \omega) = M(1/2^n, \omega)$ para todo $n \in N$, entonces tenemos que $X_n^q \sim T_n^{qH} X_0^q$ para todo $n \in N$ y todo $q > 0$. De esta forma, tenemos la siguiente relación entre las q -potencias de los periodos consecutivos de los rangos acumulados de X : $X_n^q \sim 2^{qH} X_{n+1}^q$.

Además, puesto que las dos variables aleatorias precedentes tienen la misma función de distribución conjunta y finita, entonces sus medias deben de ser iguales, denominadas, $E[X_n^q] = 2^{qH} E[X_{n+1}^q]$ lo cual nos lleva a la siguiente expresión:

$$m_q(X_n) = 2^{qH} m_q(X_{n+1}) \quad (2.8)$$

lo cual relaciona los consecutivos q th-momentos para todo $n \in N$ y todo $q > 0$.

Téngase en cuenta que la ecuación (2.8) es equivalente a la siguiente:

$$m_q(X_n) = \frac{1}{2^{qH}} m_q(X_0) \quad (2.9)$$

Por tanto, es suficiente con tomar logaritmos de base 2 en ambos lados de la ecuación (2.8) para obtener la siguiente expresión:

$$\log_2 \left(\frac{m_q(X_n)}{m_q(X_{n+1})} \right) = qH \quad (2.10)$$

Donde se establece la relación lineal entre $\log_2 \left(\frac{m_q(X_n)}{m_q(X_{n+1})} \right)$ y q , dado que $m_q(X_n)$ existe para todo $n \in N$.

El índice de autosimilaridad H del proceso aleatorio X podría ser estimado clásicamente mediante la ecuación (2.10) como $H = \frac{1}{q} \log_2 \left(\frac{m_q(X_n)}{m_q(X_{n+1})} \right)$. De esta forma, se denota como FD a esta aproximación

genérica (para $q > 0$) para el cálculo del exponente de autosimilaridad de un proceso aleatorio X .

3.2. ALGORITMO HP

En este apartado proponemos un nuevo método de cálculo para el exponente de Hurst que denominamos HP.

El método HP es una nueva herramienta creada para medir la relación entre dos activos. Si r_n y s_n son rentabilidad (logarítmicas) podemos formar una serie de productos acumulados:

$$z_n = \sum_{i=1}^n r_i s_i \quad (2.11)$$

de esta forma HP será el exponente de Hurst de la serie z_n .

Si dos activos están positivamente correlacionados, entonces el producto $r_i s_i$ tendrán normalmente el mismo signo y z_n será creciente, y esta persistencia producirá un valor de H alto y cercano a 1.

Si los dos activos están negativamente correlacionados, entonces el producto $r_i s_i$ tendrá normalmente distinto signo y z_n será decreciente, y de nuevo tendremos un valor de H alto y cercano a 1.

Por otro lado, si los dos activos no están correlacionados, entonces el producto $r_i s_i$ será aleatoriamente positivo o negativo con lo que z_n no tendrá memoria y su exponente de Hurst será cercano a 0.5.

4. APLICACIÓN PRÁCTICA

Queremos comprobar cuál de los dos factores, HFD4 y HP, explicados en la sección anterior, ofrece más información en el modelo de cuatro factores de Fama y French. Para ello consideramos un modelo de seis factores:

$$R_{it} - R_{ft} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + w_i WML_t + h_i HP_t + H_i HP_t + \epsilon_{it} \quad (3.1)$$

Para comprobar que factor es más significativo dentro del modelo, en primer lugar, planteamos un modelo de un solo factor y elegimos aquel factor F1 que mejor explique los datos. A continuación, planteamos un modelo de dos factores con F1 y el siguiente factor que mejor explique los datos. Reproducimos este proceso hasta obtener seis modelos diferentes, compuesto cada uno por un factor más que el anterior.

Obviamente, el último modelo de seis factores siempre explicará mejor los datos que el modelo con un único factor, pero si la mejora no es significativa, preferiremos el modelo de menos factores ya que es más simple.

Para medir esto usamos el criterio de información de Akaike (AIC) (Akaike, 1974), que mide la calidad relativa de un modelo teniendo en cuenta la bondad del ajuste como la complejidad del modelo.

$$AIC = 2k - \ln(L) \quad (3.2)$$

Donde k es el número de factores y L es el máximo valor de la función de verosimilitud para los parámetros estimados.

Entre un grupo determinado de modelos se elegirá el que tenga el AIC más pequeño. Nosotros proponemos cinco modelos, F1, F1 + F2, F1 + F2 + F3, F1 + F2 + F3 + F4, F1 + F2 + F3 + F4 + F5, F1 + F2 + F3 + F4 + F5 + F6. El primer modelo es el mejor si solo se utiliza un factor, el segundo es el mejor si se utilizan dos factores y así sucesivamente.

Hemos realizado este procedimiento con una muestra compuesta por 2.500 acciones de mayor capitalización de EEUU. Para algunas de estas acciones, el mejor modelo es el de un solo factor, mientras que para otras el mejor modelo es alguno de los que usan varios factores. En las siguientes tablas, se muestra la frecuencia de aparición de cada uno de los factores en los modelos construidos con esta muestra.

En la tabla 1 podemos ver que los factores que más usan las acciones para explicar sus rentabilidades son HFD4, SMB y HML (el exponente de Hurst, la capitalización y el Book to Market). Con este resultado queda patente la importancia de los dos factores centrales que componen el modelo básico de Fama y French en el análisis de rentabilidades, estando entre los tres mejores factores.

El factor HP queda en cuarta posición superando al momentum y con valores de uso bastante más bajos que los obtenidos con HFD4. Para continuar con nuestro análisis presentamos la tabla 2, donde comparamos las apariciones de HFD4 y HP.

TABLA 1.
Porcentaje de presencia de cada factor en la muestra

	2012	2013	2014	2015	2016
HML	0.511	0.411	0.718	0.757	0.663
SMB	0.9109	0.761	0.620	0.793	0.929
HFD4	0.790	0.876	0.801	0.888	0.717

MOM	0.269	0.516	0.215	0.192	0.382
MK	0.024	0.026	0.033	0.038	0.011
HP	0.633	0.612	0.510	0.460	0.471

Fuente: Elaboración Propia (2018).

En la tabla 2, observamos que un gran número de acciones hacen uso del exponente de Hurst para explicar sus rentabilidades sin importar su forma de cálculo, por ejemplo, en 2013, el 56% de las acciones usan ambas metodologías. A pesar de estos resultados, no podemos afirmar que los métodos sean indistintos ya que, si nos fijamos en el desglose individual de las dos metodologías, vemos que es HFD4 la que consigue representar a más acciones, consiguiendo el máximo porcentaje en 2015 con un 47%. En cambio, los valores obtenidos que usan solo HP son muy bajos yendo del 4-15%

TABLA 2.
FD4 vs MOM

		Ninguna	HP pero no HFD4	HFD4 pero no H	Ambos
2012	Acciones	204	223	544	1067
	Porcentaje	0.100	0.109	0.267	0.524
2013	Acciones	169	94	651	1200
	Porcentaje	0.080	0.044	0.308	0.568
2014	Acciones	232	232	911	957
	Porcentaje	0.099	0.099	0.391	0.410
2015	Acciones	145	120	1137	972
	Porcentaje	0.061	0.05	0.479	0.409
2016	Acciones	327	320	881	755
	Porcentaje	0.143	0.140	0.386	0.331

Fuente: Elaboración Propia (2018).

5. CONCLUSIONES

En este trabajo hemos introducido dos factores nuevos, HFD4 y HP, los cuales son dos metodologías diferentes para el cálculo del exponente de Hurst. El objetivo de incorporar este exponente en el modelo factorial de Fama y French, es comprobar si un factor que estudia la memoria del mercado puede aportar información relevante en el estudio de las rentabilidades de las carteras de inversión, cuestión muy estudiada por los inversionistas.

Tras el estudio realizado, hemos comprobado que el factor memoria, representado a través del exponente de Hurst, si aporta información relevante dentro del modelo factorial, pero que dependiendo de la metodología de cálculo escogida los resultados no son los mismos.

Tras una comparación de los resultados obtenidos, conjunta e individualmente, concluimos que el método de cálculo de HFD4 consigue unos resultados que aportan más información sobre las rentabilidades de las acciones que el método de cálculo de HP

Por último, queremos destacar, que en los cinco años estudiado (2012-2016) HFD4 consigue posicionar entre el primer y segundo puesto, como factor más explicativo dentro del modelo. Esto es bastante interesante, ya que el exponente de Hurst no es por sí mismo una variable económica, sino física, que se ha adaptado para poder ser usada a diversas ramas de la ciencia, en este caso al estudio de carteras.

REFERENCIAS BIBLIOGRÁFICAS

- AKAIKE, H. (1974). A new look at the statistical model identification. *IEEE Transactions on Automatic Control*, 19, 716-723.
- ALESSIO, E., CARBONE, A., CASTELLI, G., & FRAPPIETRO, V. (2002). Second-order moving average and scaling of stochastic time series. *The European Physical Journal B-Condensed Matter and Complex Systems*, 27, 197-200.
- BARABASI, A. L., & VICSEK, T. (1991). Multifractality of self-affine fractals. *Physical Review A*, 44, 2730.
- BENSAÏDA, A. (2014). Noisy chaos in intraday financial data: Evidence from the American index. *Applied Mathematics*

and Computation, 226, 258–265.

BHANDARI, L. C. (1988). Debt/Equity Ratio and Expected Common Stock Returns: Empirical Evidence. *The Journal of Finance*, 43, 507–528.

BLACK, F. (1972). Capital Market Equilibrium with Restricted Borrowing. *The Journal of Business*, 45, 444–455.

BLACK, F., & SCHOLES, M. (1973). The pricing of options and corporate liabilities. *Journal of Political Economy*, 81, 637–654.

CARHART, M. M. (1997). On persistence in mutual fund performance. *Journal of Finance*, (52), 57–82.

CHAN, L. K., HAMAOKA, Y., & LAKONISHOK, J. (1991). Fundamentals and Stock Returns in Japan. *The Journal of Finance*, 46 (5), 1739–1764.

COUILLARD, M., & DAVISON, M. (2005). A comment on measuring the Hurst exponent of financial time series. *Physica A: Statistical Mechanics and Its Applications*, 348, 404–418.

DAS, A., & DAS, P. (2006). Does composite index of NYSE represents chaos in the long time scale? *Applied Mathematics and Computation*, 174, 483–489.

FAMA, E. F., & FRENCH, K. R. (1993). The Cross-Section of Expected Stock Returns. *Journal of Finance*, 47, 427–465.

FAMA, E. F., & FRENCH, K. R. (2012). Size, value, and momentum in international stock returns. *Journal of Financial Economics*, 105, 457–472.

FAMA, E. F., & FRENCH, K. R. (2015). International tests of a five-factor asset pricing model. *Journal of Financial Economics*, 116, 443–462.

FAMA, E. F., & MACBETH, J. D. (1973). Risk, Return, and Equilibrium: Empirical Tests. *Journal of Political Economy*, 81, 607–636.

FERNÁNDEZ-MARTÍNEZ, M., & SÁNCHEZ-GRANERO, M. A. (2012). Fractal dimension for fractal structures: A Hausdorff approach, Topology and its Applications. *Topology and Its Applications*, 159, 1825–1837.

FERNÁNDEZ-MARTÍNEZ, M., SÁNCHEZ-GRANERO, M. A., & TRINIDAD-SEGOVIA, J. E. (2013). Measuring the self-similarity exponent in Lévy stable processes of financial time series. *Physica A: Statistical Mechanics and Its Applications*, 392, 5330–5345.

FERNÁNDEZ-MARTÍNEZ, M., SÁNCHEZ-GRANERO, M. A., TRINIDAD-SEGOVIA, J. E., & ROMÁN-SÁNCHEZ, I. M. (2014). An accurate algorithm to calculate the Hurst exponent of self-similar processes. *Physics Letters A*, 378, 2355–2362.

GEWEKE, J., & PORTER JUDAK, S. (1983). The estimation and application of long memory time series models. *Journal of Time Series Analysis*, 4, 221–238.

HASSLER, U. (1994). specification of long memory in seasonal time series. *Journal of Time Series Analysis*, 15, 19–30.

HURST, H. E. (1951). Long-term storage capacity of reservoirs. *Trans. Amer. Soc. Civil Eng.*, 116, 770–808.

KANTELHARDT, J. W., ZSCHIEGNER, S. A., KOSCIELNY BUDE, E., HAVLIN, S., BUNDE, A., & STANLEY, H. E. (2002). Multifractal detrended fluctuation analysis of nonstationary time series. *Physica A: Statistical Mechanics and Its Applications*, 316, 87–114.

KLEINOW, T. (2002). *Testing continuous time models in financial markets*. Humboldt-Universität.

LAKONISHOK, J., & SHAPIRO, A. C. (1986). Systematic risk, total risk and size as determinants of stock market returns. *Journal of Banking and Finance*, 10, 115–132.

LINTNER, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economics and Statistics*, 47, 13–37.

LO, A. W. (1989). Long-term memory in stock market prices. *Econometrica*, 59, 1279–1313.

MARKOWITZ, H. (1952). Portfolio Selection. *The Journal of Finance*, 7, 77–91.

MONREAL-PÉREZ, J., ARAGÓN-SÁNCHEZ, A., & SÁNCHEZ-MARÍN, G. (2012). A longitudinal study of the relationship between export activity and innovation in the Spanish firm: The moderating role of productivity. *International Business Review*, 21(5), 862–877. <https://doi.org/10.1016/j.ibusrev.2011.09.010>

MOSSIN, J. (1966). Equilibrium in a Capital Asset Market. *Econometrica*, 34, 768–783.

NOVY-MARX, R. (2013). The other side of value: The gross profitability premium. *Journal of Financial Economics*, 108, 1–28.

REINGANUM, M. R. (1981). Misspecification of capital asset pricing: Empirical anomalies based on earnings' yields and market values. *Journal of Financial Economics*, 9, 19–46.

ROSENBERG, B., REID, K., & LANSTEIN, R. (1985). Persuasive Evidence of Market Inefficiency. *Journal of Portfolio Management*, 11, 9–17.

SÁNCHEZ-GRANERO, M. A., FERNÁNDEZ-MARTÍNEZ, M., & TRINIDAD-SEGOVIA, J. E. (2015). Introducing fractal dimension algorithms to calculate the Hurst exponent of financial time series. *The European Physical Journal B-Condensed Matter and Complex Systems*, 28, 1–17.

SÁNCHEZ-GRANERO, M. A., TRINIDAD-SEGOVIA, J. E., & GARCIA PEREZ, F. (2008). Some comments on Hurst exponent and the long memory processes on capital markets. *Physica A: Statistical Mechanics and Its Applications*, 387, 5543–5551.

SHARPE, W. (1964). Capital Asset Prices: a theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19, 425–442.

STATTMAN, D. (1980). Book values and stocks returns. *The Chicago MBA: A Journal of Selected Papers*, 4, 25–45.

- TAQQU, M. S., TEVEROVSKY, V., & WILLINGER, W. (1995). Estimators for long-range dependence: an empirical study. *Fractals*, 3, 785–798.
- TITMAN, S., WEI, K., & XIE, F. (2004). Capital investments and stock returns. *Journal of Financial and Quantitative Analysis*, 39, 677–700.
- VEITCH, D., & ABRY, P. (1999). A wavelet-based joint estimator of the parameters of long-range dependence. *IEEE Transactions on Information Theory*, 45, 878–897.
- WERON, R. (2002). Estimating long-range dependence: finite sample properties and confidence intervals. *Physica A: Statistical Mechanics and Its Applications*, 312, 285–299.

UNA REVISIÓN DE LA LITERATURA SOBRE POLÍTICA FISCAL DESDE LA PERSPECTIVA DE LA TEORÍA MONETARIA MODERNA

EDUARDO GARZÓN ESPINOSA

Departamento de Economía y Hacienda Pública/Universidad Autónoma de Madrid
Calle Roncesvalles, 5, 5º, 1, Madrid, 28007

BIBIANA MEDIALDEA GARCÍA

Departamento de Economía Aplicada I/Universidad Complutense de Madrid
Calle Seseña 6, 4 A. 28024, Madrid

e-mail Eduardo Garzón: eduardo.garzon@uam.es

Resumen

En los últimos años se ha ido popularizando un marco analítico de política fiscal denominado Teoría Monetaria Moderna (MMT). Su aparición en escena no ha estado exenta de polémica debido a que muchos de sus planteamientos entran en cierta contradicción –cuando no son directamente incompatibles– con muchos principios sólidamente asentados en la literatura ortodoxa pero también heterodoxa. Esto ha llevado a muchos autores a considerar que la MMT no supone una contribución académica, sino una suerte de preceptos económicos que no tienen sustento en la teoría económica, lo que ha desembocado en duras críticas y descalificaciones, algunas de reconocidos economistas como Paul Krugman, Kenneth Rogoff o Lawrence Summers. Con el presente trabajo se pretende poner a prueba esa idea realizando un repaso por las principales perspectivas de política fiscal desde la óptica de la MMT con el objetivo de identificar nexos entre los distintos enfoques y visibilizar posibles vías de diálogo. Este repaso nos es útil para constatar que la MMT no se desarrolla en paralelo a los debates académicos previos, sino que tiene un arraigo y determinados vínculos con enfoques anteriores.

Palabras clave: Teoría Monetaria Moderna, política fiscal, revisión literatur.

Área Temática 1: Economía Internacional

Abstract

An analytical framework of fiscal policy called Modern Monetary Theory (MMT) has been popularized in recent years. His appearance on the scene has not been exempt from polemics because many of his approaches enter into a certain contradiction -when they are not directly incompatible- with many principles solidly established in orthodox and heterodox literature. This has led many authors to consider that the MMT does not suppose an academic

contribution, but a sort of economic precepts that have no basis in economic theory, which has led to harsh criticisms and disqualifications, some of well-known economists like Paul Krugman, Kenneth Rogoff or Lawrence Summers. The present paper intends to try this idea by reviewing the main perspectives of fiscal policy from the MMT view with the aim of identifying links between the different approaches and making visible possible ways of dialogue. This review is useful to verify that the MMT is not developed in parallel to the previous academic debates, but that it has roots and certain links with previous approaches.

Key Words: Modern Monetary Theory, fiscal policy, survey.

Thematic Area 1: International Economy

1. INTRODUCCIÓN

En los últimos años ha ido ganando progresivamente popularidad un marco analítico de política fiscal denominado Teoría Monetaria Moderna (MMT). Su aparición en escena no ha estado exenta de polémica debido a que muchos de sus planteamientos son incoherentes con –cuando no directamente opuestos a– muchos principios sólidamente asentados en la literatura ortodoxa y heterodoxa. De hecho, economistas ampliamente reconocidos como Paul Krugman (2019), Kenneth Rogoff (2019), o Lawrence Summers (2019) han manifestado su discrepancia con este nuevo marco teórico, al cual le han dedicado incluso palabras de desprecio. Otras personalidades reconocidas del mundo económico, como Jerome Powell y Janet Yellen, o populares multimillonarios como Warren Buffet y Bill Gates, también han tenido palabras de descrédito para dicho enfoque.

El aspecto más difundido de la MMT tiene que ver con el concepto de soberanía monetaria y con la idea de que los países que gozan de dicha soberanía no tienen ningún tipo de restricción técnica para financiar su gasto público. Esta rompedora idea facilita que proliferen respuestas que sin entrar a fondo en el análisis caricaturicen el planteamiento. Puede pensarse que a los autores de la MMT no les preocupa el déficit público o que confían en la mera creación de dinero para financiar las políticas de gasto y estimular así –sin ninguna consecuencia negativa– la actividad económica. Podría pensarse, en efecto, que estas ideas se plantean por parte de personas que no están familiarizados con las distintas contribuciones previas de teoría económica o que desafían todas ellas. Debido a ello, y también a sus pocos años de vida –sus orígenes se remontan a los años 90 del siglo pasado– no son pocos los autores que consideran que la MMT no supone una contribución académica y que no es más que una suerte de preceptos económicos sin sustento teórico sólido.

Sin embargo, la MMT, sin llegar a ser un marco teórico cohesionado y bien delimitado, tampoco parece ser fruto de una ocurrencia sin arraigo en la tradición académica. En las contribuciones de sus autores más reconocidos (Warren Mosler, Randall Wray, Stephanie Kelton, William Mitchell, Mathew Forstater o Scott Fullwiller, entre otros) se pueden encontrar planteamientos y conceptos desarrollados en la academia hace décadas que, eso sí, han cristalizado en un enfoque relativamente novedoso y provocador. Por ejemplo, el autor que seguramente más ha inspirado a la MMT es John Maynard Keynes, pero ni todas sus contribuciones son asumidas ni es el único autor que ha marcado su trayectoria: también se pueden encontrar aportaciones de Mitchell Innes, George Friedrich Knapp, Abba Lerner, Hyman Minsky o Wynne Godley, entre otros. Esta constatación ya nos indica que la MMT no es un cuerpo ajeno a los desarrollos teóricos previos, sino que se basa en la literatura existente y por tanto presenta nexos de diálogo con ella, a pesar de que buena parte de ellos cristalicen en forma de fuerte controversia o directa confrontación.

Arrojar luz sobre este asunto es precisamente lo que se pretende con este trabajo. Para ello, se realiza una revisión crítica de la literatura académica referida al impacto económico de las políticas fiscales desde la perspectiva de la MMT, con el objetivo de ir identificando puntos en común y de discordia. Este repaso nos ayudará a ubicar este particular marco analítico en sus debidas coordenadas respecto al espacio

académico previamente existente, así como a visibilizar potenciales vías de diálogo con otras tradiciones.

Para organizar el repaso por los distintos enfoques en los dos siguientes apartados se abordan las contribuciones académicas sobre las políticas fiscales expansivas y contractivas respectivamente, haciendo siempre hincapié en el impacto de los gastos o los ingresos públicos sobre la actividad económica. Después, el cuarto apartado aborda los efectos económicos de la política fiscal pero desde el punto de vista del saldo fiscal, como propone la MMT, y no de sus componentes tomados de forma individual. Finalmente, en las conclusiones se señalan las principales diferencias y similitudes con la literatura presentada.

2. EFECTOS DE LA POLÍTICA FISCAL EXPANSIVA

2.1. LA DEMANDA EFECTIVA Y LOS MULTIPLICADORES FISCALES DE KEYNES

Si existe un enfoque de política fiscal claramente presente en la MMT es el que deriva de las contribuciones de John Maynard Keynes, de las más importantes e influyentes del siglo XX en el campo de la política económica. Antes de que sus trabajos vieran la luz, los economistas clásicos consideraban que las políticas públicas de gasto e ingreso no afectaban al nivel agregado del producto y el empleo. Concretamente, se suponía que cada unidad monetaria gastada por el Estado era una unidad monetaria que el sector privado dejaba de gastar, de forma que el volumen total de gasto e ingreso quedaba inalterado. Subyacía la idea de que el estado natural de la economía era el de pleno empleo y de plena utilización de la capacidad productiva, de modo que ningún estímulo fiscal podría incrementar adicionalmente el producto ya que no existirían personas desocupadas para emplear ni recursos que poner en marcha para aumentar la producción. El gasto del sector público sólo podría materializarse como sustitución a un gasto privado que, en ausencia del primero, se habría realizado (Blinder y Solow, 1972, p. 1).

En cambio, tras la detallada exposición que Keynes realizó —en un artículo en “The Times” en 1934 y posteriormente en “La teoría general”— comenzó a cobrar fuerza la idea de que una unidad monetaria gastada de forma adicional podía elevar el ingreso nacional. Keynes pudo hacer esta novedosa interpretación porque partió de una premisa distinta: frente a la creencia generalizada de que en una economía siempre se emplean todos los recursos, el economista británico hizo hincapié en que tal estado era sólo uno de muchos posibles, siendo de hecho más habitual que los recursos (la mano de obra entre ellos) estuvieran ociosos (Keynes, 1964 [1936], p. 3). En efecto, en una economía en la que hubiera personas desocupadas y máquinas en desuso, aumentos de gasto público o disminución de impuestos permitirían que personas desempleadas se pusieran en marcha para utilizar dichas máquinas, elevando así el producto (Samuelson, 1948; Seidman, 2012, p. 88).

Ésta fue una de las principales contribuciones de Keynes: el desarrollo del concepto de “demanda efectiva” (tal y como la denominó en el capítulo 3 de “La teoría general”). Esta insuficiencia de demanda agregada se debía, a su vez, al deseo de ahorro por parte de los agentes económicos: toda unidad monetaria ahorrada era una unidad que no se convertía en consumo y que por lo tanto no contribuía a elevar el producto. Mientras que los economistas clásicos asumían que los ahorros de las familias eran canalizados a través de préstamos a empresas para instalar más

máquinas y así poder atender a la demanda futura de dichas familias (dejando, por lo tanto, intacto el nivel de demanda agregada), Keynes señalaba que el gasto no realizado en el presente no tenía por qué ser materializado en el futuro, implicando por lo tanto una reducción en la demanda agregada (Keynes, 1964 [1936], p. 210).

Acorde a Keynes, ese deseo de ahorro es más fuerte cuanto mayor es la incertidumbre, de forma que ahorrar sería en el mecanismo lógico de protección frente a imprevistos. Puesto que los periodos en los que hay más incertidumbre serían aquellos atravesados por una crisis o recesión económica, el nivel de demanda efectiva sería menor durante esta época y, por tanto, mayores las posibilidades de incrementar el producto gracias a shocks de demanda. El corolario lógico de todo este razonamiento es la invitación a utilizar la política fiscal expansiva (aumento de gasto o reducción de impuestos) durante los periodos de crisis o recesión económica –e, inversamente, a relajar esta política durante los periodos de expansión. Por otro lado, Keynes tenía muy en cuenta que no todos los agentes económicos tienen la misma propensión al ahorro, sino que ésta sería más elevada para aquellos de mayor renta e, inversamente, más reducida para los de menos. Por eso, a mayor concentración de la renta, menor demanda efectiva y menor producto. En consecuencia, Keynes proponía la utilización de la política fiscal para disminuir la desigualdad de los ingresos y así estimular el producto, especialmente a través de mayor presión fiscal sobre todas las formas de ingreso recibidas desproporcionalmente por los más adinerados (Keynes, 1964 [1936] p. 95).

Los autores de la MMT adoptan estos planteamientos de incertidumbre, propensión al ahorro e insuficiencia de demanda en determinados momentos del ciclo, pero crean un nuevo concepto con el que pretenden superar al de “demanda efectiva”: la “demanda dirigida”. En vez de incrementar la demanda agregada con las típicas políticas expansivas que incrementarían la renta y el empleo de casi todas las capas de la población sin apenas distinción, los autores de la MMT proponen una forma de dirigir el impulso de la demanda hacia quienes menos renta tienen (Tcherneva, 2011). La fórmula para “dirigir” esa demanda extra (inspirada en la medida del “Empleador de último recurso” de Hyman Minsky, 1986), se conoce como Job Guarantee y toma la forma de planes de empleos públicos a un salario mínimo y fijo, garantizados para toda aquella persona que quiera trabajar. Se considera que, a diferencia de lo que ocurriría con las típicas políticas que incrementan la demanda efectiva pero también la inflación, el Job Guarantee conseguiría pleno empleo con estabilidad de precios: la condición de salario mínimo y fijo mantendría controlada la tendencia alcista de los costes laborales a la vez que el nuevo gasto público beneficiaría a las capas con menos renta, manteniendo controlada así la demanda para la mayor parte de la población (Murray y Forstater, 2013)¹.

Pero Keynes no sólo se limitó a señalar que un aumento adicional de gasto podía elevar en igual cantidad el producto nacional, sino que podía ampliarse gracias a lo que vino a denominar “multiplicadores de gasto”². Aunque su aportación inicial se refería a cualquier componente de la demanda agregada, muy pronto la atención se

¹ Así lo proponen Mitchell y Watts (1997) y Gordon (1997) para Australia, Wray (1997), Murray (2013) y Tcherneva, (2018) para Estados Unidos, Antonopoulos y otros (2013) para Grecia, y Garzón y Guamán (2015) para España.

² Un concepto ya presentado por primera vez en 1930 por Richard F. Kahn en un artículo no publicado y que fue brevemente desarrollado un año más tarde en un artículo en “Economic Journal” (Kahn 1931).

centró en los multiplicadores fiscales, es decir, en el impacto que podía tener sobre el producto un cambio en el gasto o ingreso público.

El concepto de multiplicador fiscal dejó una huella importantísima, no sólo en los autores que reivindican explícitamente su tradición keynesiana. Y, sin embargo, los autores de la MMT los ignoran, pues no son útiles para su desarrollo argumental, que como veremos se establece en términos de saldo neto en lugar de en términos de gastos e ingresos tomados de forma independiente.

En definitiva, Keynes es una fuente de inspiración importante para la MMT, pero no de forma absoluta. Entre los principales elementos que la MMT adopta destaca el papel estratégico de la demanda pública para incidir sobre el nivel de producción, la conveniencia de activar políticas fiscales expansivas en determinados momentos del ciclo, así como la relación clave entre la distribución de la renta y la composición de la demanda. Entre los elementos de ruptura, matización o exclusión cabría resaltar el énfasis en la demanda dirigida frente a la demanda efectiva, el desinterés por los multiplicadores fiscales, y la puesta en valor del saldo fiscal en su conjunto. A continuación revisaremos enfoques sobre política fiscal que están en las antípodas teóricas del planteamiento keynesiano, y veremos qué conexión presenta con la MMT.

2.2. EFECTO “CROWDING-OUT” Y EFECTO RIQUEZA DE LA POLÍTICA FISCAL

Uno de los primeros cuestionamientos importantes que recibió la visión keynesiana de la política fiscal vino del enfoque “neoclásico” liderado por Lucas (1972, 1973) y Sargent y Wallace (1975), basado en la distinción entre los impactos transitorios y los permanentes de dicha política³. Acorde a estos planteamientos, aunque un shock de gasto público lograra incrementar a corto plazo el producto, también generaría una serie de condiciones que terminarían lastrando la actividad económica, neutralizando así los efectos positivos iniciales. Existen dos tipos de razonamiento que explicarían dicho efecto: uno asociado con la demanda de crédito y otro con el efecto riqueza.

El primero es conocido como efecto “crowding-out” del gasto público. Algunos autores se han referido con este término al fenómeno de desplazamiento de recursos reales que tenían en mente los economistas clásicos y que ya ha sido mencionado —el gasto público se realiza a costa del gasto privado— (Blinder y Solow, 1972, p. 3) pero en este caso se trata de un efecto distinto: el impacto económico positivo de cualquier shock de gasto público financiado con deuda acabaría siendo neutralizado por la caída en otros componentes de la demanda agregada. Es importante destacar que este tipo de crowding-out “financiero” es independiente del crowding out “real” aludido antes: teniendo en cuenta los distintos grados de utilización de capacidad productiva que tiene una economía, el crowding out “real” sólo podría ocurrir cuando la economía está a pleno rendimiento; en cambio, el crowding out financiero podría ocurrir tanto en una economía con pleno empleo como sin él (Friedman, 1978, p. 4). La MMT acepta el efecto crowding-out “real” pero rechaza el crowding out “financiero”, como veremos enseguida.

³ Esta distinción ya había sido puesta de manifiesto por Friedman (1957) y Modigliani y Brumberg (1954), entre otros.

El razonamiento del efecto crowding-out es el siguiente. La obtención de financiación para cubrir el incremento del gasto público disminuiría la cantidad de fondos prestables, provocando su encarecimiento. Por un lado, el encarecimiento de la financiación a los agentes económicos privados perjudica el consumo y la inversión; por otro lado, los activos financieros nacionales pasan a ser más atractivos que los extranjeros, conllevando una entrada de capital que aprecia la moneda, favoreciendo importaciones y perjudicando exportaciones. En consecuencia, la caída en la inversión, en el consumo y en las exportaciones netas desplazaría el efecto positivo inicial provocado por el shock de gasto público. El resultado sería, por lo tanto, neutro o incluso negativo (Van der Ploeg, 2005).

Los autores de la MMT rechazan de raíz este razonamiento porque no consideran que el incremento del déficit público aumente los tipos de interés, sino que creen precisamente lo contrario: los tipos de interés tenderían a bajar. Coincidiendo con los análisis del circuito monetario de Augusto Graziani (1990) y Alain Parguez y Mario Seccareccia (2000) –entre otros–, la MMT sostiene que todo shock de déficit público incrementa la cantidad de reservas bancarias, lo que empuja a la baja los tipos de interés en el mercado interbancario ya que los bancos intentan colocar ese exceso de reservas para poder darles rentabilidad (y frente a una demanda de reservas que no habría variado el resultado sería un descenso de los tipos). Ahora bien, esa tendencia a reducir los tipos de interés se vería respondida por el banco central ofreciendo más rentabilidad al mantenimiento de reservas u ofreciendo una alternativa de inversión financiera más rentable: los bonos públicos (Mosler y Forstater, 2004; Tymoigne, 2014, 2016). Como resultado, el incremento del gasto público no encarecería la financiación ni perjudicaría el consumo o la inversión, así como tampoco apreciaría los activos nacionales ni deterioraría el saldo comercial. En resumen, la MMT mantiene un razonamiento opuesto al ampliamente extendido del crowding-out “financiero”.

La segunda explicación señalada sobre por qué el gasto público no estimula la actividad económica a medio plazo revive un argumento utilizado por David Ricardo denominado “hipótesis de la equivalencia ricardiana”⁴: los agentes económicos aumentan su ahorro en exactamente la misma cantidad en la que se eleva el déficit público, borrando por completo su efecto positivo. La base de este razonamiento es la siguiente: los consumidores entenderían que el incremento del déficit público tendría que ser compensado en un futuro con incrementos tributarios, de forma que, para afrontar dichos gastos futuros, incrementarían su ahorro, lo cual perjudicaría el consumo y la inversión. Resultado: el déficit público no tendría ningún impacto en la actividad económica (Barro 1974; Buiter 1977)⁵.

La MMT, coincidiendo con los postulados poskeynesianos, rechaza este fenómeno: los hogares basan sus decisiones de gasto en sus preferencias de ahorro y consumo -variables que no se ven afectadas por el déficit público-, mientras que las empresas basan sus decisiones de inversión en la rentabilidad esperada, también independiente del déficit público (Wray, 2012a; Juniper y otros, 2014; Mitchell, 2015). Además, como veremos más adelante, los autores de la MMT consideran que el Estado –bajo determinadas condiciones– no tiene necesidad de reducir el

⁴ Entre los responsables de revivir esta idea se encuentran Bailey (1971), Barro (1974) y Kochin (1974).

⁵ Se aporta evidencia empírica de este tipo de efectos no keynesianos en Feldstein (1982), Christiano y Eichenbaum (1992), Aiyagari y otros (1992) y Baxter y King (1993).

déficit público, y por tanto queda invalidada la idea de que el sector privado tenga que “prepararse” para un futuro incremento de impuestos (o reducción de gastos).

Existen muchos trabajos que han tratado de abordar la existencia del efecto crowding-out en función de la forma de financiar el incremento del gasto público: Coenen y Straub (2005) y Cwik y Wieland (2009) concluyen que el déficit público financiado con deuda provoca un efecto crowding-out sobre el consumo privado y – sobre todo– la inversión. Otros han señalado que ese efecto negativo no se produce –o su efecto es reducido- si el endeudamiento es externo, puesto que el efecto crowding-out se traslada al extranjero (Farhi y Werning 2017; Priftis y Zimic, 2018; Broner y otros, 2018). Por su parte, Jong y otros (2017) señalan que la inversión pública financiada con deuda conlleva más ganancias de productividad que si fuese financiada con recortes de gastos. Por otro lado, Mountford y Ulich (2009) puntualizan que, puestos a financiar con deuda una expansión fiscal, mejor hacerlo con recortes impositivos y no con aumentos de gasto. Otros trabajos como los de Baxter y King (1993), Ludvigson (1996) y Bom y Ligthart (2014) encuentran que este efecto crowding-out sobre el consumo y la inversión se produciría también aunque el déficit público se financiase con impuestos distorsionantes.

En definitiva, insistimos en que el debate sobre posibles “crowding out” no tiene sentido desde la óptica de la MMT. De hecho, la MMT impugna la preocupación misma por la forma de financiar el déficit público: Acorde a sus postulados, inspirados en el enfoque chartalista de Knapp (1924), un Estado con soberanía monetaria (que emite la moneda que utiliza) no necesitaría disponer de dinero para gastar, sino que le bastaría con acreditar las cuentas bancarias de los receptores de ese gasto; para ingresar, lo único que tendría que hacer es debitar las cuentas bancarias de los contribuyentes. Como lo que el Estado debitaría es dinero que inyectó antes a través del gasto, el déficit público no sería más que la cantidad de dinero que el Estado no habría retirado de la economía a través de impuestos, ergo hablar de financiación del gasto carecería de sentido: no se puede financiar algo que se contabiliza después de realizar el gasto (Tymoigne y Wray, 2013; Medina, 2016; Mitchell y otros, 2019).

3. EFECTOS DE LA CONSOLIDACIÓN FISCAL

3.1. EFECTOS EXPANSIVOS NO KEYNESIANOS Y TIPOS DE CONSOLIDACIONES

En general, lo que se aplica para una política fiscal expansiva se aplica en sentido contrario para una política fiscal contractiva. Así, para los economistas clásicos, con la economía siempre en pleno empleo, la unidad monetaria que dejase de gastar el sector público se gastaría por el sector privado, dejando el producto inalterado. En cambio, desde un punto de vista keynesiano, la reducción de gastos o el incremento de impuestos tienen un efecto negativo en el producto a través de una reducción de la demanda efectiva. Este planteamiento general es compartido por la MMT, aunque centra su atención –como se verá más adelante– en el saldo fiscal y no en la evolución individual de los gastos o de los ingresos. Por último, partiendo de un enfoque neoclásico, las consolidaciones fiscales podrían ser expansivas solo en el caso de que que se interpretaran como un indicador de futuras reducciones de impuestos, lo cual animaría al gasto presente.

Esto último se conoce como “efectos expansivos no keynesianos”, estudiados mediante distintas metodologías y definiciones de contracción fiscal. Por ejemplo Perotti (1999), Van Riet (2010) y Afonso (2010) encuentran que la consolidación fiscal expansiva es más probable cuando los niveles de deuda pública son elevados, y OCDE (1996) cuando la política monetaria acompaña. Algunos autores, como Feldstein (1982), Giavazzi y Pagano (1990, 1996) y Giavazzi y otros (2000) señalan la importancia de la dimensión de la consolidación fiscal, mientras otros como Alesina y Ardagna (1998), Alesina y otros (2002), Giudice y otros (2003) y Forni y otros (2009) destacan la importancia de su composición. Para McDermott y Westcott (1996) ambos factores tienen el mismo nivel de importancia.

En cuanto a los planteamientos de la MMT, la consolidación fiscal sólo sería necesaria cuando la economía estuviese utilizando plenamente (o casi) sus capacidades productivas y se estuvieran generando tensiones inflacionistas. Para cualquier otro estado de la economía toda consolidación fiscal lastraría la actividad económica (Medina, 2016; Mitchell y otros 2019).

La mayoría de los analistas considera que los efectos de ajustes fiscales difieren si se basan en gastos o en ingresos⁶. Puesto que los multiplicadores de los gastos improductivos son reducidos, algunos autores, consideran que la reducción de estos gastos debería protagonizar la expansión fiscal no keynesiana (De Castro, 2005; Afonso, 2010; Warmendinger y otros 2015; Gechert, 2015); Gechert y Rannenber (2014) descartan esta idea en recesión económica, ya que los multiplicadores de dichos gastos sí serían elevados en ese momento.

Por otro lado, múltiples trabajos sostienen que aunque un recorte de salarios públicos tiene un impacto negativo a corto plazo, a medio y largo plazo el efecto podría ser positivo gracias al efecto de imitación que se produciría en el sector privado⁷, lo que a su vez mejoraría las expectativas de beneficio e inversión empresarial así como la competitividad de la economía (Afonso y Gómez, 2008; Linnemann, 2009; Hernández y Moral-Benito, 2016). En algunos de ellos se hace hincapié en que los efectos contractivos a corto plazo de los recortes salariales son menos perjudiciales para la economía que los provocados por recortes en empleo (Lamo y otros, 2016; Bermpetoglou y otros, 2013). Y, generalmente, se considera que la mejor forma de reducir la factura de los sueldos públicos es a través de reformas estructurales y no temporales (IMF, 2015; Forni y Novta, 2015). Otros como Algan y otros (2002), Stähler y Thomas (2011) o Stepanyan y Leigh (2015), ponen el foco sobre el volumen de empleo público y no tanto sobre los salarios.

Desde el punto de vista de consolidar las cuentas públicas a través de ajustes impositivos también existe mucha heterogeneidad de estudios y resultados. Por un lado se señala que, como los multiplicadores de los ajustes impositivos serían más elevados que los de gasto, estos últimos serían menos recesivos y duraderos (Alesina y Ardagna, 1998; Giavazzi y otros, 2000; von Hagen y otros, 2001; Kataryniuk y Vallés, 2015; Alesina y otros 2019). No obstante, está mucho más extendido en la literatura –especialmente en los últimos años– el planteamiento opuesto: los multiplicadores fiscales son más altos si la consolidación se basa en gastos (Batini y otros 2012; Blot y otros, 2014; Carbonnier y otros 2016). Por su

⁶ Hay excepciones como Kilponen y otros (2015).

⁷ Este mecanismo de transmisión es estudiado, entre otros, por Lindquist y Vilhelmsson (2006) y Lamo y otros (2012).

parte, Fazzari y otros (2012) matizan que esto sólo se cumpliría en lo más bajo del ciclo.

Basándose en estos planteamientos (multiplicadores de gasto más elevados que los de ingresos) se propone un tipo de consolidación fiscal que pretende ser lo más eficiente y menos dañina posible: budget balanced expansion. Consiste en incrementar los ingresos y gastos simultáneamente para sanear las cuentas a la vez que se estimula la actividad económica. Desarrollos concretos de esta propuesta se pueden encontrar en Wren-Lewis (2011), Mulheim (2012), Ragan (2013), Karagounis y otros (2015), Uxó y Álvarez (2017) y Uxó y otros (2018).

Desde la perspectiva de la MMT la posición frente a esta propuesta es clara: mientras haya holgura en la capacidad productiva de la economía y, por lo tanto, posibilidad de incrementar el producto y empleo a través de un incremento de la demanda dirigida, no existe ningún motivo para consolidar las cuentas. Apoyándose en el enfoque de las haciendas funcionales de Abba Lerner (1941), se defiende que la política fiscal debería guiarse por el impacto que provoca en las variables económicas reales (nivel de empleo y de inflación, fundamentalmente) y nunca por los niveles abstractos de déficit o deuda pública (Nersisyan y Wray, 2016; Cruz y Parejo, 2017). En caso de economía a pleno rendimiento y aplicación de consolidación fiscal, suele preferirse incrementos impositivos frente a reducciones de gasto, sin llegar a señalar qué tipo de tributos serían los más adecuados (Mosler, 2014).

3.2. CONSOLIDACIÓN FISCAL CON ALTOS NIVELES DE DEUDA PÚBLICA

Ya apuntábamos antes que algunos autores señalan que la consolidación fiscal expansiva es más probable cuando los niveles de deuda pública son elevados (Reinhart y Rogoff, 2009; Cecchetti y otros, 2011; Eberhardt y Presbitero, 2015; Doménech y González-Páramo, 2017). El razonamiento de fondo es que cuando la deuda pública presenta niveles elevados los multiplicadores se contraen y el crecimiento económico queda lastrado, por lo que la mejor forma de darle la vuelta a la situación sería disminuyendo la deuda (Kumar y Woo, 2010; Afonso y Alves, 2015; Hernández y otros, 2018). De ahí que exista una amplia literatura que indaga sobre cuáles son los niveles óptimos de deuda pública para asegurar el crecimiento económico (Woodford, 1990; Aiyagari y McGrattan, 1998; Werning, 2007) o, al menos, cuáles son los niveles prudenciales de deuda pública que protegen frente a la suspensión de pagos (Bi y otros, 2013; Daniel y Shiamptanis, 2013; Collard y otros, 2015). Según Baum y otros (2012), estos niveles óptimos han cambiado tras la crisis económica de 2008.

Tradicionalmente se ha considerado que existen dos canales fundamentales a través de los cuales la mala situación de las finanzas públicas puede disminuir los multiplicadores fiscales y afectar al crecimiento económico: a) el incremento en el pago de intereses de deuda pública y b) el efecto riqueza (expectativas de incrementos impositivos).

Con respecto al pago de intereses, las dificultades de financiación del Estado derivadas del incremento en el spread financiero contagiarían al sector privado, dificultando el consumo y la inversión (Corsetti y otros, 2013; Vranceanu y Besancenot, 2013). Precisamente por ello, los ajustes fiscales, aunque tengan a corto plazo un impacto negativo en la actividad económica, podrían arrojar resultados positivos a medio plazo si consiguen una reducción en la prima de riesgo

(Blanchard, 1990; Nickel y Tudyka, 2013; Locarno y otros, 2013). Aunque, como apuntan Chang y Leblond (2016) y Lalik (2017), si la elevada prima de riesgo se debe a factores exógenos y no a la mala situación de las finanzas públicas, los efectos negativos de una consolidación podrían ser mayores de lo esperado (no tendría por qué reducir la prima de riesgo a corto plazo). A la inversa, también puede haber factores exógenos que expliquen que una mala situación fiscal no sea castigada con elevación de primas de riesgo (Afonso, 2007).

En cuanto al efecto riqueza, los niveles elevados de deuda pública serían entendidos como antesalas de incrementos impositivos, de forma que los agentes económicos reaccionarían reduciendo su consumo e inversión para maximizar el ahorro (Chalk y Tanzi, 2002; Demirci y otros, 2017). De ahí que autores como Blanchard (1990), Afonso (2010) o Abbas y otros (2013) señalen que cuando la deuda pública es elevada es más probable disfrutar de efectos no keynesianos mediante la consolidación fiscal, ya que los agentes económicos esperarían que el gobierno no elevase mucho los impuestos en el futuro para pagar la deuda que estaría liquidando en la actualidad.

Muchos autores utilizan estos planteamientos para señalar la pertinencia de aplicar consolidaciones fiscales a la mayor velocidad posible cuando el endeudamiento público es muy elevado: con multiplicadores pequeños existe un amplio margen para aplicar los ajustes fiscales sin que el impacto negativo a corto plazo sea muy importante (Müller, 2013; Corsetti y otros, 2013; Bi y otros, 2013; Díaz-Roldán, 2015). Desde este punto de vista, aunque a corto plazo los ajustes fiscales puedan contraer el PIB, también conllevarían una recuperación más temprana y menores costes en términos de valor actualizado (Almeida y otros 2010).

Sin embargo, otros autores no encuentran relación directa entre posición fiscal o nivel de deuda pública y crecimiento económico. Según Égert (2012), esta relación queda siempre contaminada por muchos factores coyunturales, de forma que con muestras suficientemente amplias no identifica relaciones significativas. Por su parte, Panizza y Prebistero (2012) señalan que cuando se ajustan las cuentas públicas teniendo en cuenta los efectos por el tipo de cambio, la relación entre deuda pública elevada y crecimiento desaparece (al menos para las economías avanzadas).

Estos últimos planteamientos son coherentes con el enfoque de la MMT: un Estado que tenga el grado máximo de soberanía monetaria (es decir, que emita la moneda que utiliza, que establezca un tipo de cambio flexible y que emita bonos en su moneda) puede evitar la insolvencia siempre que se lo proponga, por lo que elevados niveles de deuda pública no tendrían por qué suponer un problema para el crecimiento económico (Mosler, 2014; Mitchell y otros, 2016). Tampoco sería problemático el elevado pago de intereses, porque no se entiende la emisión de bonos como un mecanismo para financiar el déficit público sino solamente para controlar los tipos de interés. En consecuencia, un Estado con plena soberanía monetaria podría perseguir sus objetivos de economía política sin preocuparse por los niveles de deuda o déficit público; sólo se debería preocupar por los niveles de desempleo (cuando la demanda agregada fuese insuficiente) y por los niveles de inflación (cuando la demanda agregada fuese excesiva) (Medina, 2016; Mitchell y otros, 2019). Por otra parte, y como ya se ha adelantado, el efecto de riqueza negativo es rechazado en los análisis de la MMT, por lo que tampoco explicaría que fuese preocupante tener elevados niveles de deuda.

3.3. CAMBIOS TRAS LA CRISIS DE 2008

Antes de la crisis económica internacional de 2008 se consideraba generalmente que los multiplicadores fiscales no variaban notablemente a lo largo del tiempo⁸. Sin embargo, posteriormente muchos autores constataron que los multiplicadores comenzaron a elevarse tras la crisis (Baum y Koester 2011; Mitnik y Semmler, 2012; Karras, 2013)⁹.

Muchas explicaciones –la mayoría complementarias entre sí– han emergido para dar respuesta al aumento del valor de los multiplicadores fiscales. Una de ellas sitúa la recesión como causa de este incremento, debido a que en dicha fase del ciclo hay más holgura para incrementar la renta a partir de incrementos de demanda efectiva –concretamente de gasto público–. Encuentran evidencia en este sentido Auerbach y Gorodnichenko (2012), Fazzari y otros (2012) y Michailat (2012) para Estados Unidos; Baum y otros (2012) para los países del G7 (exceptuando Italia); Batini y otros (2012) para Estados Unidos, la Eurozona y Japón; Warmedinger y otros (2015) para la Eurozona; Qazizada y Stockhammer (2015) para 21 países de la OCDE; y Bellod (2015) para los PIGS (Portugal, Irlanda, Grecia y España). Otros hacen hincapié en que después de una recesión los multiplicadores de ingreso son más elevados que los de gasto, como Kataryniuk y Vallés (2015) o Alesina y otros (2015).

Esta interpretación ha llevado a muchos autores a sugerir que, puestos a realizar consolidaciones fiscales, estas no deberían aplicarse en periodos de recesión sino cuando el crecimiento se hubiera recuperado, lo que disminuiría el impacto y duración del impacto provocado por los ajustes fiscales (Christodoulakis, 2013; Blot y otros, 2014; Ferreira y otros, 2014; Rodríguez-Ortiz, 2014; Blanchard y Portugal, 2017).

Es más, muchos analistas señalan que la consolidación fiscal durante las recesiones económicas podría ser contraproducente, incrementando la deuda pública, que es precisamente lo contrario que se perseguiría. A esta paradoja se le suele denominar “austeridad autoderrotada”: políticas fiscales restrictivas materializadas en momentos de recesión económica –y por lo tanto con multiplicadores de gasto elevados– agravarían aún más la actividad económica, provocando con ella una caída de los ingresos impositivos, un aumento de los gastos asociados a los estabilizadores automáticos y, por lo tanto, un empeoramiento de las finanzas públicas. En consecuencia, los ajustes fiscales en periodos de recesión podrían no reducir el déficit público (de hecho podría aumentar) y, sobre todo, podría provocar hacer crecer el indicador de deuda pública sobre el PIB debido al afecto adicional sobre el denominador. De forma inversa, aplicar políticas fiscales expansivas podría contribuir a reducir tanto el déficit público como la deuda pública a través de un impulso del PIB y, consecuentemente, mayores ingresos y menores gastos (Boyer, 2012; Botta y Tori, 2018). Se hace hincapié sobre estas paradojas en los trabajos de Gros y Maurer (2012), Dodig y Herr (2014), Mastromatteo y Rossi (2015) y Rodríguez-Ortiz (2016) para la

⁸ Por supuesto, había excepciones. Por ejemplo, Kirchner y otros (2010) señalaron que la efectividad de la política fiscal había estado decreciendo durante las últimas décadas, mientras que otros como Burriel y otros (2009) o Paredes y otros (2009) indicaban exactamente lo contrario.

⁹ Algunos analistas no han encontrado evidencia de esta subida post crisis en los multiplicadores, como Owyang y otros (2013) o, para el caso de la inversión pública, Jong y otros (2017). Otros, consideran que se trata de un fenómeno a corto plazo sin gran importancia (Górnicka y otros, 2018).

Eurozona y los Estados Unidos, Muñoz de Bustillo (2014) para la Unión Europea de los 27 y Fatás y Summers (2018) para multitud de economías avanzadas y emergentes. En cambio, otros trabajos ponen de manifiesto que el incremento de la deuda pública en porcentaje del PIB como consecuencia de los ajustes fiscales es transitorio, ya que con el tiempo volvería a bajar hasta su nivel inicial (Cherif y Pasanov, 2012) o incluso por debajo (Eyraud y Weber, 2013). Attinasi y Metelli (2016) matizan que esto último sólo es así si la consolidación se realiza a través de recortes de gastos y no de ingresos.

El reconocimiento de la importancia de los estabilizadores automáticos ha servido para cuestionar la consolidación fiscal expansiva recurriendo también a dos argumentos adicionales. El primero es que la causalidad podría ir desde la recuperación de la actividad económica hacia el saneamiento de las cuentas públicas, y no al revés como los defensores de los efectos no keynesianos mantienen. El segundo es que la salud de las finanzas públicas no dependería únicamente de las políticas fiscales aplicadas sino que responderían también al ciclo económico, algo que a menudo ignorarían los proponentes de los efectos no keynesianos (Guajardo y otros 2011; Baker y Rosnick, 2014). Estos planteamientos que cuestionan la idoneidad del ajuste fiscal son nucleares para la propuesta analítica de la MMT, como veremos más adelante.

Otra explicación de por qué los multiplicadores fiscales son mayores después de 2008 reside en el bajísimo nivel de los tipos de interés que mantienen los bancos centrales tras la crisis. La idea es que mientras en condiciones normales las autoridades monetarias -rigiéndose por la regla de Taylor¹⁰- elevan los tipos de interés cuando persiguen enfriar la economía y contener la inflación, cuando están comprometidas a mantener tipos cercanos a cero no cuentan con esta posibilidad, por lo que cualquier shock fiscal calentaría la actividad económica. Entre los distintos estudios teóricos que existen al respecto destacan los de Woodford (2011), Denes y otros (2013) y Bletzinger y Lalik (2017). Algunos estudios empíricos son los de Coenen y otros (2012), Christiano y otros (2011), Stehn (2012) y DeLong y Summers (2012) para Estados Unidos, Boussard y otros (2012) y Burgert y Wieland (2012) para la Unión Europea, y Eichengreen y O'Rourke (2012) para la Eurozona.

En realidad, las dos últimas explicaciones -la recesión y los tipos de interés como causa del mayor nivel de los multiplicadores- podrían ser compatibles, - aunque para Hall (2009) el hecho de que en las recesiones previas a 2009 los multiplicadores no fueran tan elevados indicaría que la causa del nuevo fenómeno fuese la política monetaria. En la misma línea Erceg y Lindé (2014) aseguran que esta particular situación dependerá del tiempo que se mantenga vigente la política monetaria ultraexpansiva. Por otro lado, mientras para algunos este sería el momento propicio para consolidar fiscalmente a través de recortes de gasto, aprovechando que en este contexto dicho movimiento podría resultar expansivo (Bi y otros, 2013), para otros el impacto en el PIB de recortes de gasto es más elevado que el de aumentos impositivos cuando los tipos de interés están próximos a cero (Eggertsson, 2011).

Otra explicación al aumento de los multiplicadores tras 2008 radica en el intenso desapalancamiento que registran los sectores privados tras la crisis. Con tasas de crecimiento del crédito y del consumo privado reducidas o incluso negativas,

¹⁰ Propuesta por John B. Taylor (1993), se trata de vincular el tipo de interés oficial del dinero a la evolución de los precios, del producto interno bruto y de otras variables económicas.

cualquier estímulo del gasto público encontraría vía libre para impactar fuertemente en la actividad económica (Afonso y otros 2011; Eggertsson y Krugman, 2012; Farhi y Werning, 2012). Batini y otros (2016) muestran, además, que el lastre que la deuda privada impone al crecimiento económico es más severo que el producido por el endeudamiento público. Asimismo, analistas como Andrés y otros (2016) añaden que el proceso de desapalancamiento podría ser perjudicado y ralentizado si se realizasen consolidaciones fiscales agresivas, retrasando la recuperación económica y causando mayores pérdidas de actividad en el medio plazo. Siguiendo un razonamiento similar, la débil demanda externa resultante de la crisis internacional conformaría otra explicación al incremento de los multiplicadores fiscales tras la crisis, ya que estaría actuando como lastre a la demanda del sector privado, permitiendo una fácil sobrereacción de la economía frente a cualquier shock de gasto público (Eyraud y Weber, 2013). Como se verá a continuación, y en coherencia con estos últimos planteamientos, incorporar la deuda privada y la demanda externa al análisis de la política fiscal es clave para los autores de la MMT.

4. SALDO FISCAL

Todos los enfoques analizados hasta el momento se centran en el análisis aislado ya sea del gasto o del ingreso público. Quizás la única excepción sea la consideración de los ingresos y gastos cíclicos –pues aborda tangencialmente las interrelaciones que pueden existir entre ellos– pero, en cualquier caso, sigue sin abordarse explícitamente el saldo público como variable relevante en sí. La apreciación no es irrelevante y de hecho son múltiples los analistas que han señalado cuán importante es poner el foco en el saldo en su conjunto en vez de hacerlo de forma separada sobre los ingresos o los gastos; los autores de la MMT se encuentran entre ellos.

Algunos trabajos insisten en las ventajas o desventajas que supone presentar superávits fiscales. Los hay que consideran que registrar más ingresos que gastos es un requisito indispensable para acumular colchones fiscales con los que afrontar desafíos futuros como crisis económicas o el envejecimiento de la población (Ghosh, 1995; Auerbach y Gale, 2000; Afonso, 2007; Eichengreen y Panizza, 2016); otros, como los autores de la MMT, consideran que los superávits públicos son, en esencia, negativos para la actividad económica al detraer más recursos del sector privado –a través de impuestos, fundamentalmente– de los que se les suministra –a través de servicios y prestaciones públicas, fundamentalmente– (Papadimitriou y Wray, 1998; Brenton y Pierre, 2016; Connors y Mitchell, 2017). Por otra parte, es extensa la literatura que estudia la relación entre el saldo fiscal y el externo, mientras que es mucho menos frecuente la incorporación explícita del tercer saldo (sector privado) al análisis. Lo abordamos a continuación.

4.1. CUATRO INTERPRETACIONES SOBRE LA RELACIÓN ENTRE EL SALDO FISCAL Y EL SALDO POR CUENTA CORRIENTE

Existe un debate muy particular con respecto a la relación que existe entre el saldo fiscal y el saldo por cuenta corriente. En primer lugar la interpretación convencional, la “hipótesis de los saldos gemelos¹¹”, establece que un shock de déficit público

¹¹ Este término surgió en los años 80 del siglo XX al calor del importante crecimiento que estaban experimentando tanto el déficit fiscal como el déficit por cuenta corriente de Estados Unidos (Miller y Russek, 1989).

provoca crowding out de tipo financiero que incrementa el déficit por cuenta corriente. Según esta hipótesis, el incremento del déficit público elevaría los tipos de interés, provocando una entrada de capitales y una apreciación de la moneda. Dicha apreciación perjudicaría a las exportaciones e impulsaría las importaciones, deteriorando el saldo por cuenta corriente. Muchos autores han encontrado evidencia en este sentido para distintas economías y periodos temporales, destacando Abell (1990), Bahmani-Oskooee (1992), Leachman y Francis (2002) y Blanchard (2007) para Estados Unidos EEUU; Vamvoukas (1999) y Brissimis y otros (2010) para Grecia; Chinn y Prasad (2003) para varias economías industriales y emergentes; Salvatore (2006) y Teney (2014) para las economías del G7 – incluyendo a Australia el último–; Beetsma y otros (2008) y Bluedorn y Leigh (2011) para 14 países de la Unión Europea y la Eurozona, respectivamente. Erceg y otros (2005) también encuentran evidencia en este sentido pero matizan la intensidad de la causalidad. Por su parte, Kim y Roubini (2008), en un estudio para Estados Unidos, obtienen resultados inusuales: los shocks fiscales no deterioran el saldo por cuenta corriente, sino que lo mejoran. Los autores de la MMT que, como dijimos rechazaban el efecto crowding out, no comparten este razonamiento.

Otra interpretación importante es la ya mencionada hipótesis de la equivalencia ricardiana, aplicada esta vez al saldo fiscal. La idea es que no existe relación causal entre ambos saldos. Incrementos en el gasto público serían interpretados por el sector privado como la antesala de incrementos de impuestos, de forma que se reduciría el consumo y aumentaría el ahorro privado. Así, el incremento de la demanda agregada provocado por el shock de gasto público quedaría neutralizado y el saldo por cuenta corriente no cambiaría. El saldo por cuenta corriente sólo respondería a los cambios del sector privado (Barro, 1989). Algunos estudios que encuentran evidencia empírica sobre esta hipótesis para Estados Unidos son los de Miller y Russek (1989), Enders y Lee (1990), Dewald y Ulan (1990) y Kim (1995). A la misma conclusión llega Evans (1986) para Canadá, Bélgica, Francia, Alemania, Países Bajos, Suiza y Reino Unido; y Kaufmann y otros (2002) para Austria. Por su parte, Bernheim (1987) –para el caso de EEUU– y Cardia (1997) –para el caso de los países del G7– encuentran poca evidencia que respalde la hipótesis de la equivalencia ricardiana. La MMT también rechaza este planteamiento por los motivos señalados con anterioridad.

Una tercera hipótesis es la denominada “current account targeting”¹², que establece una relación de causalidad entre los dos saldos inversa a la tradicional, que comparte la MMT: el incremento en el déficit por cuenta corriente provocaría un mayor déficit público (Summers, 1988; Nikiforos y otros 2015). El razonamiento suele aplicarse a Estados Unidos, debido a la peculiaridad que supone el privilegio de ser el emisor de la moneda de reserva internacional. Así, según Stiglitz (2010) la condición del dólar como moneda de reserva haría que se demandasen muchos activos financieros nominados en dólares, empujando así al alza el déficit comercial –los dólares se estarían usando para inversiones financieras en vez de para compras de productos estadounidenses–, lo que debilitaría a su vez la demanda agregada del país. Para compensar este impacto se aplicarían políticas fiscales expansivas y eso provocaría el déficit fiscal. Coppola (2018) da un paso más:

¹² Término atribuido a Summers (1988): los gobiernos se preocupan por el saldo por cuenta corriente, de forma que los desequilibrios en dicho saldo suelen conllevar políticas fiscales orientadas a mantener el equilibrio.

Estados Unidos estaría obligada a presentar déficit fiscal y por cuenta corriente debido a esa enorme demanda internacional de dólares e, intentar reducir esos déficits podría provocar (y, de hecho, señala que lo suele hacer) crisis nacionales y también internacionales.

Otros autores aplican este razonamiento no solo a EEUU sino de forma generalizada: los desequilibrios por cuenta corriente podrían producirse por asimetrías productivas, diferencias en competitividad, en especialización productiva, por fuga de capitales, u otra gran cantidades de factores no directamente controlables. Los déficits externos sustraerían demanda agregada y empleos, por lo que el déficit fiscal se dispararía (tanto involuntariamente por los estabilizadores automáticos como voluntariamente por decisiones políticas). En consecuencia, el déficit por cuenta corriente provocaría déficits fiscales, no a la inversa. Entre los estudios empíricos que aportan evidencia en este sentido están los de: Kearney y Monadjemi (1990) para los países del G7 incluyendo a Irlanda; Bussiere y otros (2005) para 21 miembros de la OCDE; Marinheiro (2008) para Egipto; Stockhammer y Sotiropoulos (2012), Flassbeck y Lapavitsas (2013) y Nersisyan y Wray (2016) para la Eurozona; Kalou y Paleologou (2012) y Nikiforos y otros (2015) para Grecia; y Glötzl y Rezai (2017) para 22 países de la Unión Europea.

La cuarta interpretación que recogemos presenta relaciones causales bidireccionales entre los dos saldos. Biswas y otros (1992) en un estudio para Estados Unidos hacen una distinción entre el saldo público causado por decisiones políticas y el saldo público que responde al ciclo económico para señalar que el primero afecta al déficit por cuenta corriente, mientras que el segundo es afectado por los cambios exógenos en el comercio exterior. La causalidad iría, por tanto, desde el saldo público hacia el saldo por cuenta corriente cuando se adoptasen políticas fiscales, y seguiría el camino inverso cuando determinados cambios exógenos en el comercio afectaran a las variables presupuestarias. Este último razonamiento es compartido por Chang y Hsu (2009), quienes –en un estudio para cinco países de Europa del norte, cuatro “tigres asiáticos” y Estados Unidos- añaden la importancia de los rescates bancarios. Por su parte, Florio y Ghiani (2015) -con datos de Estados Unidos- indican que la causalidad propia de los déficits gemelos se da en periodos de expansión económica –con bajo ahorro privado y evolución alcista en el precio de los activos- mientras que la causalidad propia de la “current account targeting” se presentaría en tiempos de recesión económica, cuando el gobierno actuase fiscalmente para impedir desequilibrios en el saldo por cuenta corriente.

Por otro lado, Khalid y Guan (1999) y Kouassi y otros (2004) analizan una muestra amplia de países desarrollados y subdesarrollados y encuentran un abanico diverso de sentidos de causalidad entre los dos saldos. En concreto, encuentran evidencia de causalidad bidireccional para las economías de India y Canadá. Entre las razones que barajan para explicar esta variedad de causalidad se encuentran las siguientes: a) el deterioro en la cuenta corriente conllevaría menor crecimiento y, en consecuencia, mayor déficit público (causalidad propia de la “current account targeting”); b) los ineficientes sistemas de tributación forzarían a financiar los déficits públicos con ahorro externo, lo que deterioraría el saldo por cuenta corriente (causalidad propia de los déficits gemelos); y c) la apertura comercial explicaría cuán intenso es el efecto de los cambios exógenos en el comercio sobre el saldo fiscal (casualidad propia de la “current account targeting”). Esta última explicación es

similar a la desarrollada por Fountas y Tosukis (2000) quienes, utilizando datos de Estados Unidos, Canadá, Japón, Australia, Países Bajos, Reino Unido y Alemania, hacen hincapié en que la causalidad propia de la orientación hacia la cuenta corriente puede ser un signo de economías financieramente abiertas, mientras que la inexistencia de causalidad entre los dos saldos (equivalencia ricardiana) se daría en economías cerradas.

4.2. LOS TRES SALDOS SECTORIALES DE LA MMT

La MMT recuperan la mayoría de estos razonamientos, pero de forma particular: la introducción explícita de un tercer saldo, el del sector privado (empresas y hogares). Este elemento, normalmente ausente en los análisis sobre el saldo fiscal, supone para la MMT la pieza clave que completa el puzle que supone no sólo el errático diálogo entre el saldo fiscal y el externo, sino también el ya señalado galimatías sobre el impacto de las políticas fiscales. Incorporar este tercer saldo al análisis contribuiría a abordar de una forma más sencilla y coherente muchos de los problemas y desafíos señalados hasta ahora (Wray, 2012a; Mitchell y otros, 2016; Ehnts, 2016).

Con este enfoque, que bebe de los planteamientos de Godley y Cripss (1983), se parte de que existe una orgánica y sistemática vinculación entre los tres saldos: contablemente los saldos se compensan entre sí y su suma ha de ser igual a 0. En consecuencia, el nivel del saldo fiscal siempre tendría su reflejo en los otros dos. Por ejemplo, sólo se podría obtener equilibrio presupuestario si el resto de saldos estuviesen equilibrados o si el saldo positivo de uno de los dos estuviese compensado con el saldo negativo del otro. De la misma forma, sólo se podría registrar superávit fiscal si al menos uno de los otros dos saldos fuese deficitario. Este planteamiento tiene importantes implicaciones: para poder lograr equilibrio presupuestario sería necesario que a) el sector privado nacional gastase más (o lo mismo) de lo que ingresase; b) el sector exterior gastase más (o lo mismo) de lo que ingresase —esto es, que registrase superávit por cuenta corriente o saldo nulo—; o c) una combinación de a y b. Así las cosas, sólo podrían lograr el saneamiento de las cuentas públicas las economías con superávit por cuenta corriente y/o con apalancamiento privado.

Esta simple identidad contable no implica vínculos causales, pero los economistas de la MMT los establecen a partir de los siguientes elementos teóricos: a) la teoría del dinero-crédito de Mitchell Innes (1913), b) la teoría chartalista de George Friedrich Knapp (1924), c) el principio de la demanda efectiva de Keynes (1964 [1936]), d) las “haciendas funcionales” que presentó Abba Lerner (1941), e) la concepción poskeynesiana del dinero endógeno, f) los principios de consistencia en los flujos y stock de Godley y Crips (1983), g) la hipótesis de la inestabilidad financiera de Himan Minsky (1986) y h) la teoría del circuito monetario de Augusto Graziani (1990).

Basándose en dicho entramado teórico la MMT arroja los siguientes postulados: 1) puesto que la propensión a ahorrar del sector privado sería frecuente y notable, el saldo público tendería a estar en déficit por regla general y el sector privado en superávit, aunque el sobreendeudamiento privado y el superávit por cuenta corriente podrían alterar esta inercia (Juniper y Mitchell, 2008; Ehnts, 2016); 2) una economía con superávit por cuenta corriente podría permitirse tener un superávit del sector privado y del público al mismo tiempo, puesto que la renta exterior

permitiría acumular ahorro privado sin necesidad de déficit público (Mitchell y Muysken, 2008; Semieniuk y otros, 2011); 3) las economías que registran de forma estructural un déficit por cuenta corriente sólo podrían encontrar el “equilibrio” del que nos habla la identidad contable de tres formas: a) a través de un déficit público sostenido que compensase el saldo negativo por cuenta corriente (haciendo inviable la consolidación fiscal), b) a través de un déficit privado que compensase el saldo negativo por cuenta corriente (provocando un endeudamiento privado que no podría ser indefinido), o c) una combinación de a y b (Arestis y Sawyer, 2004; Papadimitrou y otros, 2018); 4) la lógica consecuencia de estos planteamientos es que las economías con déficit por cuenta corriente solo podrían lograr la consolidación fiscal a costa de socavar constantemente el ahorro del sector privado, algo que no podría ser sostenible ni duradero (Sawyer, 2011; Wray, 2012b).

De este enfoque se derivan dos diferentes propuestas, compatibles entre sí. Por un lado, que el déficit público (no el gasto público) debería elevarse todo lo necesario para atender el deseo de ahorro del sector privado (con un saldo por cuenta corriente determinado), y la forma propuesta para hacerlo sería con el mencionado Job Guarantee. Eso sí, en países con saldo externo superavitario la captación de renta desde el exterior podría estar cubriendo las necesidades de ahorro del sector privado, por lo que podría no ser necesario registrar e incrementar el déficit público (Hansgen y Papadimitrou, 2012; Wray, 2012a; Mitchell y otros, 2019; Sawyer, 2018). En el contexto de la eurozona el estímulo del déficit público se podría conseguir mediante el presupuesto europeo (Papadimitrou y otros 2013; Hein y Detzer, 2014), o abandonando el euro y recuperando la soberanía monetaria para no tener restricciones financieras (Mitchell, 2015; Medina, 2016).

Por otro lado también se propone, recuperando a Keynes, redistribuir la renta desde los beneficios a los salarios (con mayor propensión al consumo), lo que permitiría “secar” el exceso de ahorro y así, reducir una parte del déficit público que viene explicado por exceso de ahorro del sector privado (Sawyer 2011; Wray, 2012b; Hein y Detzer, 2014; Nikiforos, 2016).

5. CONCLUSIONES

Un recorrido por la literatura existente sobre el impacto económico de la política fiscal permite identificar similitudes y diferencias que existen entre la MMT y el resto de enfoques. Este ejercicio es útil también para visibilizar que, en contra de la impresión que ha ido generalizando, los postulados de la MMT no son ajenos a la literatura especializada previamente existente, sino que se apoya y mantiene un rico diálogo con buena parte de ella.

En primer lugar, la MMT comparte los planteamientos de Keynes de incertidumbre, propensión al ahorro e insuficiencia de demanda en determinados momentos del ciclo, aunque elabora un nuevo concepto con el que pretende superar el de “demanda efectiva”: la “demanda dirigida”. La política fiscal expansiva más apropiada no sería la inversión pública, como plantea la mayoría de enfoques existentes, sino la del Job Guarantee. De esta forma, el estímulo a la demanda efectiva no sería generalizado sino focalizado a la población de menos renta, lo que contribuiría a evitar tensiones inflacionistas. Otra diferencia notable con el análisis de Keynes es que los autores de la MMT ignoran los multiplicadores fiscales.

En segundo lugar, aunque desde la MMT se admite que puede existir el efecto crowding-out “real” cuando la economía está a pleno rendimiento, se rechaza completamente la existencia del efecto crowding-out “financiero” (típico de la economía neoclásica). Se sostiene que los déficits públicos no incrementarían los tipos de interés y, en consecuencia, no habría encarecimiento de la financiación ni apreciación de la moneda como consecuencia del registro de déficits públicos.

En tercer lugar, a diferencia de lo que ocurre con la mayoría de enfoques, la MMT sostiene que niveles elevados de déficit público no tienen por qué suponer un problema para las economías que gozan del mayor grado de soberanía monetaria, a las que no se les supone ningún tipo de restricción financiera. La única complicación a la que se enfrentarían es de tipo inflacionario, en el caso de que la capacidad productiva utilizada se aproximase a la instalada. Un Estado con estas características podría permitirse todos los niveles de déficit y deuda que necesitase por lo que las reglas fiscales de estabilidad presupuestaria carecerían de sentido; lo que debería guiar la política fiscal es el impacto que provoca en las variables económicas reales (nivel de empleo y de inflación, fundamentalmente) y no los niveles de déficit o deuda pública. En consecuencia, las consolidaciones fiscales sólo deberían ser aplicadas cuando la economía estuviese utilizando plenamente (o cerca de hacerlo) sus capacidades productivas y preferiblemente actuando sobre los ingresos y no sobre los gastos. Para cualquier otro estado de la economía, toda consolidación fiscal sería indeseable porque lastraría la actividad económica.

En cuarto lugar, para la MMT el objeto más relevante de análisis es el saldo público, y no cualquiera de sus dos componentes (gastos e ingresos) de forma aislada. Sólo así se podría obtener una imagen precisa de la interrelación que existe entre la política fiscal y el sector privado (nacional y extranjero). Esta relación sistemática que queda representada por las identidades contables permitiría constatar cómo el habitual deseo de ahorro por parte de los agentes privados derivado de la incertidumbre con respecto al futuro explicaría que el registro de déficits públicos fuese la tónica habitual. En quinto lugar Como consecuencia, la deuda privada y la demanda externa pasarían a ser variables claves a la hora de abordar la política fiscal: cualquiera de las dos incrementaría el gasto en la economía, reduciendo así la necesidad de que fuese el déficit público el que rellenase la insuficiencia de demanda. Los Estados sólo podrían alcanzar superávit fiscal si disfrutasen de superávit por cuenta corriente y/o si el sector privado se situase en déficit (lo cual no perduraría, especialmente si ello ocurre durante burbujas de crédito).

En sexto lugar, la TMM comparte la visión de la “austeridad autoderrotada”, puesto que cualquier intento de reducir el déficit público conllevaría inevitablemente –por identidad contable– una presión a la baja sobre el superávit del sector privado (interno y/o externo), lo cual tendría en principio un efecto recesivo sobre la actividad económica. Los estabilizadores automáticos cerrarían el círculo vicioso: la débil actividad económica arrojaría menos ingresos impositivos y más gastos públicos que empeorarían el saldo fiscal. En séptimo y último lugar, se considera que la relación causal entre los saldos del sector público y de cuenta corriente no sería constante, sino que dependería de la evolución del saldo privado: cuando éste permaneciese estable, un empeoramiento (una mejora) del saldo público provocaría un deterioro (una mejora) en el saldo por cuenta corriente, y viceversa. La idea es coherente con la hipótesis de los déficits gemelos y la “current account targeting”, y

entra en contradicción con la hipótesis de la equivalencia ricardiana. Por último, cuando el saldo privado variase, las posibilidades serían numerosas.

REFERENCIAS

- CORNING, J.; LEVY, A. (2002): Demand for Life Theater with Market Segmentation and Seasonality. *Journal of Cultural Economics*, 26 (3), 217-235.
- ENDERS, W. (1995): *Applied Econometric Time Series*. John Wiley and Sons, Nueva York.
- DOBSON, L.C.; WEST, E.G. (1997): Performing Arts Subsidies and Future Generations. En TOWSE, R. (ed.): *Cultural Economics: The Arts, The Heritage and The Media Industries*, Vol. I, 151-159. Cheltenham: Edward Elgar Publishing.
- ABBAS, S.A., AKITOBY, B., ANDRITZKY, J., BERGER, H., KOMATSUZAKI, T. Y TYSON, J. (2013): *Dealing with high debt in an era of low growth*. IMF Staff Discussion Note SDN/13/07.
- ABELL, J. D. (1990): Twin déficits during the 1980s: and empirical investigation. *Journal of Macroeconomics* 12 (1), 81-96.
- AFONSO, A. (2007): *Public finances in Portugal: a brief long-run view*. ISEG-UTL Economics Working Paper No. 01/2007/DE/CISEP/UECE.
- AFONSO, A. (2010): Expansionary fiscal consolidation in Europe: new evidence. *Applied Economics Letters* 17 (2), 105-109.
- AFONSO, A. y ALVES, J. (2015): The role of government debt in economic growth. *Hacienda Pública Española / Review of Public Economics* 215, 9-26.
- AFONSO, A. y GOMES, P. (2008): *Interaction between private and public sector wages*. ECB Working Paper No. 971.
- AFONSO, A., BAXA, J. y SLAVIK, M. (2011): *Fiscal developments and financial stress: a threshold VAR analysis*. ECB Working Paper No. 1319.
- AIYAGARI, S. R., CHRISTIANO, L. y EICHENBAUM, M. (1992): The output, employment, and interest rate effects of government consumption. *Journal of Monetary Economics* 30, 73-86.
- AIYAGARI, S. R. y MCGRATTAN (1998): The optimum quantity of debt. *Journal of Monetary Economics* 42, 447-469.
- ALESINA, A. y ARDAGNA, S. (1998): Tales of fiscal adjustments. *Economic Policy* 27, 489-545.
- ALESINA, A., ARDAGNA, S., PEROTTI, R. y Schiantarelli, F. (2002): Fiscal policy, profits, and investment. *American Economic Review* 92 (3).
- ALESINA, A., BARBIERO, O., FAVERO, C., GIAVAZZI, F., y Paradisi, M. (2015): Austerity in 2009-13. *Economic Policy* 30(83), 383-437.
- ALESINA, A., FAVERO, C. y GIAVAZZI, F. (2019): *Austerity: When It Works and When It Doesn't*. Princeton University Press.
- ALGAN, Y., CAHUC, P. y ZYLBERBERG, A. (2002): Public employment: does it increase unemployment? *Economic Policy* 17, 7-65.
- ALMEIDA, V., CASTRO, G., FÉLIZ, M. y MARIA, J. F. (2010): *Fiscal stimulus in a small Euro Area economy*. Bank of Portugal Working Paper No, 16/2010.
- ANDRÉS, J., ARCE, O. y THOMAS, C. (2016): *When fiscal consolidation meets private deleveraging*. Banco de España Documentos de Trabajo No. 1622.
- ANTONOPOULOS, R., ADAM, S., KIM, K., MASTERSON, T. y PAPADIMITRIOU, D.B. (2013): *Impact of a Job Guarantee policy for Greece*. Levy Economics Institute of Bard College Public Policy Brief No. 138.

- ARESTIS, P. y SAWYER, M. (2004): On fiscal policy and budget deficits. *European Journal of Economics and Economic Policies: Intervention* 1 (2), 61-74.
- ASCHAUER, D.A. y GREENWOOD, J. (1985): Macroeconomic Effects of Fiscal Policy. *Carnegie-Rochester Conference Series on Public Policy* 23, 91-138.
- ATTINASI, M.A. y METELLI, L. (2016): *Is fiscal consolidation self-defeating? A panel-VAR analysis for the euro area countries*. ECB Working Paper Series No. 1883.
- AUERBACH, A. J. y GALE, W. G. (2010): Activist fiscal policy to stabilize economic activity. *Financial Stability and Macroeconomic Policy* 327 74.
- AUERBACH, A. J. y GORODNICHENKO, Y. (2012): Measuring the output responses to fiscal policy. *American Economic Journal: Economic Policy* 4(2), 1-27.
- BAHMANI-OSKOOEE, M. (1992): What are the long-run determinants of the U.S. trade balance? *Journal of Post Keynesian Economics* 15 (1), 85-97.
- BAILEY, M. J. (1971): National income and the price level: A study in macroeconomic theory. New York: McGraw-Hill.
- BAKER, D. y ROSNICK, D. (2014): *Stimulus and fiscal consolidation: the evidence and implications*. IMK Working Paper No. 135.
- BARRO, R. J. (1974): Are government bonds net wealth? *Journal of Political Economy* 82: 1095-1117.
- BARRO, R. J. (1981): Unanticipated money growth and economic activity in the United States. En BARRO, R. J. (ed) *Money, Expectations, and Business Cycles: Essays in Macroeconomics*. New York: Academic Press
- BARRO, R. J. (1989): The neoclassical approach to fiscal policy. En BARRO, R.J. (ed.). *Modern Business Cycle Theory*. Cambridge, Mass.: Harvard University Press.
- BATINI, N., CALLEGARI, G. y MELINA, G. (2012): *Successful austerity in the United States, Europe and Japan*. International Monetary Fund Working Paper No. WP/12/190.
- BATINI, N., MELINA, G. y VILLA, S. (2016): *Fiscal buffers, private debt, and stagnation: the good, the bad and the ugly*. IMF Working Paper, No. 16/104.
- BAUM, A., y KOESTER, G.B. (2011): *The impact of fiscal policy on economic activity over the business cycle. Evidence from a threshold VAR analysis*. Bundesbank Discussion Paper No. 03/2011.
- BAUM, A., POPLAWSKI-RIBEIRO, M. y WEBER, A. (2012): *Fiscal multipliers and the state of the economy*. IMF Working Paper No. 12/286
- BAXTER, M. y KING, R. (1993): Fiscal policy in general equilibrium. *American Economic Review* 83, 315-334.
- BEETSMA, R, GIULIODORI, M. y KLAASSEN, F. (2008): The effects of public spending shocks on trade balances and budget deficits in the European Union. *Journal of the European Economic Association* 6 (2–3), 414–23
- BELLOD, J.F (2015): PIGS: fiscal austerity, structural reforms and potential growth. *Revista de Economía Mundial* 43, 161-178.
- BERMPEROGLOU, D., PAPPAS, E. y VELLA, E. (2013): *Spending cuts and their effects on output, unemployment and the deficit*. Mimeo, European University Institute.
- BERNHEIM, B. D. (1987): *Ricardian equivalence: an evaluation of theory and evidence*. NBER Working Paper No. 2330.
- BI, H., LEEPER, E.M., y LEITH, C. (2013): Uncertain fiscal consolidations. *Economic Journal* 123, 31-63.
- BISWAS, B., TRIBEDY, G. y SAUNDERS, P. (1992): Further analysis of the twin deficits. *Contemporary Policy Issues* 10, 104-107.

- BLANCHARD, O.J. (1990): *Suggestions for a new set of fiscal indicators*. OECD Working Paper No. 79.
- BLANCHARD, O. (2007): Current account deficits in rich countries. *Panoeconomicus* 54 (2), 127-158
- BLANCHARD, O. J., y LEIGH, D. (2013): *Growth forecast errors and fiscal multipliers*, National Bureau of Economic Research.
- BLANCHARD, O. y PORTUGAL, P. (2017): *Boom, slump, sudden stops, recovery, and policy options: Portugal and the Euro*. Peterson Institute for International Economics Working Paper No. 17-8.
- BLETZINGER, T. y LALIK, M. (2017): *The impact of constrained monetary policy on the fiscal multipliers on output and inflation*. ECB Working Paper Series No. 2019.
- BLINDER, A. S. y SOLOW, R. M. (1972): *Does fiscal policy matter?* Econometric Research Program. Research Memorandum No. 144.
- BLOT, C., COCHARD, M., CREEL, J., DUCOUDRÉ, B., SCHWEISGUTH, D. y TIMBEAU, X. (2014): Fiscal consolidation in times of crisis: is the sooner really the better? *Revue de l'OFCE* 132 (1), 159-192.
- BLUEDORN, J. y LEIGH, D. (2011): Revisiting the twin deficits hypothesis: the effect of fiscal consolidation on the current account. *IMF Economic Review* 59, 582-602.
- BOM, P.R.D y LIGTHART, J.E (2014): Public infraestructura investment, output dynamics, and balanced budget fiscal rules. *Journal of Economic Dynamics & Control* 40, 334-354.
- BOTTA, A. y TORI, D. (2018): The theoretical and empirical fragilities of the expansionary austerity theory. *Journal of Post Keynesian Economics* 41 (3), 364-398
- BOUSSARD, J., DE CASTRO, F. y SALTO, M. (2012): Fiscal multipliers and public debt dynamics in consolidations. *Economic Papers* 460.
- BOYER, R. (2012): The four fallacies of contemporary austerity policies. *Cambridge Journal of Economics* 36 (1), 283–312.
- BRAUN, R. A. y MCGRATTAN, E. R. (1993): The macroeconomics of war and peace. En FISCHER S. y BLANCHARD O. J. (eds.) *NBER Macroeconomics Annual*: 197– 247. Cambridge, MA: MIT Press.
- BRENTON, S. y PIERRE, J. (2016): Budget surplus goal experiments in Australia and Sweden. *New Political Economy* 22 (5), 557-572.
- BRISSIMIS, S. N., HONDROYIANNIS, G., PAPAZOGLU, C., TSAVEAS, N. T. y VASARDANI, M. A. (2010): *Current account determinants and external sustainability in periods of structural change*. ECB Working Paper Series No. 1243.
- BRONER, F., CLANCY, D., ERCE, A. y MARTIN, A. (2018): *Fiscal multipliers and foreign holdings of public debt*. Working Papers 30, European Stability Mechanism.
- BUITER, W. H. (1977): Crowding out and the effectiveness of fiscal policy. *Journal of Public Economics*, 309-328.
- BURGERT, M. y WIELAND, V. (2013): The role of tax policy in fiscal consolidation: insights from macroeconomic modelling. European Commission Economic Papers No. 502.
- BURRIEL, P. F., DE CASTRO, D., GARROTE E., GORDO J., PAREDES J. y PÉREZ J., (2009): Fiscal policy shocks in the Euro area and the US: an empirical assessment. ECB Working Paper Series No. 1133.
- BUSSIERE, M., FRATZSCHER, M. y MÜLLER, G. (2005): *Productivity shocks, budget deficits and the current account*. ECB Working Paper Series No. 509.
- CARBONNIER, C., PALIER, B. y ZEMMOUR, M. (2016): Tax cuts or social investment? Evaluating the opportunity cost of French employment strategy. *Cambridge Journal of Economics* 40 (6), 1687–1705.

- CARDIA, E. (1997): Replicating Ricardian equivalence tests with simulated series. *The American Economic Review* 87 (1), 65-79.
- CECCHETTI, S. G., MOHANTY, M. S. y ZAMPOLLI, F. (2011): *The real effects of debt*. BIS Working Paper No. 352.
- CHALK, N.A. y TANZI, V. (2002): Impact of large public debt on growth in the EU: A discussion of potential channels. En BUTI, M., HAGEN, J. V., MONGAY, C., VON HAGEN, J. y MARTÍNEZ MONGAY, C. (eds) *The behaviour of fiscal authorities: Stabilization, growth and institutions* (pp. 186-211). London: Palgrave.
- CHANG, J.C. y HSU, Z. (2009): *Causality relationships between the twin deficits in the regional economy*. Department of Economics, National Chi Nan University China, Puli.
- CHANG, M. y LEBLOND, P. (2015): All in: market expectations of Eurozone integrity in the sovereign debt crisis. *Review of International Political Economy* 22(3), 626-655.
- CHERIF, R. y HASANOV, F. (2012): *Public debt dynamics: the effects of austerity, inflation, and growth shocks*. IMF Working Paper No. 230.
- CHINN, M. D. y PRASAD, E. S. (2003): Medium-term determinants of current accounts in industrial and developing countries: an empirical exploration. *Journal of International Economics* 59, 47-76.
- CHRISTIANO, L. J. y EICHENBAUM, M. (1992): Current real business cycle theories and aggregate labor market fluctuations. *American Economic Review* 82, 430-450.
- CHRISTIANO, L. J., EICHENBAUM, M. y REBELO, S. (2011): When is the government spending multiplier large? *Journal of Political Economy* 119 (1), 78-121.
- CHRISTODOULAKIS, N. (2013): From Grexit to growth: on fiscal multipliers and how to end recession in Greece. *National Institute Economic Review* 224.
- COENEN, G. y STRAUB, R. (2005): Does government spending crowd in private consumption? Theory and empirical evidence for the Euro area. *International Finance* 8.
- COENEN, G., ERCEG, C. J., FREEDMAN, C., FURCERI, D., KUMHOF, M., LALONDE, R., LAXTON, D., LINDE, J., MOUROUGANE, A., MUIR, D., MURSULA, S., DE RESENDE, C., ROBERTS, J., ROEGER, W., SNUDDEN, S., TRABANDT, M., y IN'T VELD, J. (2012): Effects of fiscal stimulus in structural models. *American Economic Journal: Macroeconomics* 4(1), 22-68
- COGAN, J.F., CWILK, T., TAYLOR, J.B. y WIELAND, V. (2010): New Keynesian versus old Keynesian government spending multipliers. *Journal of Economic Dynamics and Control* 34, 281-295.
- COLLARD, F., HABIB, M. y ROCHET, J. (2015): Sovereign debt sustainability in advanced economies. *Journal of the European Economic Association* 13, 381-420.
- CONNORS L. y MITCHELL, W. (2017): Framing Modern Monetary Theory. *Journal of Post Keynesian Economics* 40 (2), 239-259.
- CORSETTI, G., KUESTER, K., MEIER, A. y MÜLLER, G.J. (2013): Sovereign risk, fiscal policy, and macroeconomic stability. *Economic Journal, Royal Economic Society*, 99-132.
- COPPOLA, F. (2018): *The myth of monetary sovereignty*. Coppola Comment: Finance, Economic and Music. Disponible en <http://www.coppolacomment.com/2018/11/the-myth-of-monetary-sovereignty.html?showComment=1541245658452#c968752334166774369>. Último acceso el 3 de abril de 2019.
- CRUZ, E. y PAREJO, F. (2017): La "teoría monetaria moderna": una extensión de la economía política radical. Asociación Española de Historia Económica Documento de Trabajo No. 1704.
- CWIK, T. y WIELAND, V. (2009): *Keynesian government spending multipliers and spillovers in the Euro Area*. Discussion Paper Series No. 7389. CEPR.
- DANIEL, B. C. y SHIAMPTANIS, Ch. (2012): Fiscal risk in a monetary union. *European*

Economic Review 56 (6), 1289–1309

DE CASTRO, F. (2005): *Una evaluación macroeconómica de la política fiscal en España*. Banco de España, estudios económicos No. 76.

DELONG, B. J. y SUMMERS, L. H. (2012): Fiscal policy in a depressed economy. *Brookings Papers on Economic Activity* No. 233–297.

DEMIRCI, I., HUANG, J. y SIALM, C. (2017): *Government debt and corporate leverage: international evidence*. NBER Working Papers No. 23310.

DENES, M., EGGERTSSON, G.B, GILBUKH, S. (2013): *Deficits, public debt dynamics, and tax and spending multipliers*. Federal Reserve Bank of New York Staff Report No. 551.

DEWALD, W. y ULAN, M. (1990): The twin-deficit illusion. *Cato Journal* 9 (3), 689-707.

DÍAZ-ROLDÁN, C. (2017): *Fiscal performance in monetary unions: how much austerity should be allowed?* *Panoeconomicus* 64(1), 61-76.

DODIG, N. y HERR, H. (2014) Current account imbalances in the EMU: an assessment of official policy responses. *Panoeconomicus* 62 (2), 193-216.

DOMÉNECH, R. y GONZÁLEZ-PÁRAMO, J.M. (2017): *Budgetary stability and structural reforms in Spain: lessons from the recession and options for the future*. BBVA Research Working Paper No. 17/05.

EBERHARDT, M. y PRESBITERO, A.F. (2015): Public debt and growth. *Journal of International Economics* 97, 45-58.

ÉGERT, B. (2012): *Public debt, economic growth and nonlinear effects: myth or reality?* OECD Economics Department Working Papers No. 993.

EGGERTSSON, G. B. (2011): *What fiscal policy is effective at zero interest rates?* NBER Macroeconomics Annual No. 25.

EGGERTSSON, G. B. y KRUGMAN, P. (2012): Debt, deleveraging, and the liquidity trap: a fisher-minsky-koo approach. *The Quarterly Journal of Economics* 127 (3), 1469-1513.

EHNTS, D. H. (2016): *Modern Monetary Theory and European Macroeconomics*. London: Routledge.

EICHENGREEN, B. y O'ROURKE, K. H. (2012): *Gauging the multiplier: lessons from history*. Vox EU.

EICHENGREEN, B. y PANIZZA, U, (2014): *A surplus of ambition: can Europe rely on large primary surpluses to solve its debt problem?* CEPR Discussion Paper No. 10069.

ENDERS, W. y LEE, B. (1990): Current account and budget deficits: twins or distant cousins? *The Review of Economics and Statistics* 72 (3), 373-381.

ERCEG, C. J., GUERRIERI, L. y GUST, C. (2005): Expansionary fiscal shocks and the US trade deficit. *International Finance* 8 (3), 363-397.

ERCEG, C. y J. LINDÉ (2014): Is there a fiscal free lunch in a liquidity trap? *Journal of the European Economic Association* 2(1), 73-107.

EVANS, P. (1986): Is the dollar high because of large budget deficits? *Journal of Monetary Economics* 18, 227-249.

EYRAUD, L. y WEBER, A. (2013) The challenge of debt reduction during fiscal consolidation. IMF Working Paper No. 13/67.

FARHI, E., GOPINATH, G. y ITSKHOKI, O. (2012): *Fiscal devaluations*. Princeton University, mimeo.

FARHI, E. y WWERNING, I. (2017): Fiscal multipliers: liquidity traps and currency unions. *Handbook of Macroeconomics* 2, 2417–2492.

FATÁS, A. y SUMMERS, L. (2018): The permanent effects of fiscal consolidations. *Journal of International Economics* 112(C), pages 238-250.

- FAZZARI, S.M., MORLEY, J. y PANOVSKA, I. (2012): State-dependent effects of fiscal policy. Australian School of Business Research Paper No. 2012.
- FELDSTEIN, M. (1982): Government deficits and aggregate demand. *Journal of Monetary Economics*, 1-20.
- FERREIRO, J., GÁLVEZ, C. y GONZÁLEZ, A. (2014): Fiscal policies in the European Union during the Crisis. *Panoeconomicus* 62(2), 131-155
- FIEBIGER, B. (2012): *Modern money theory and the real-world accounting of 1-1<0: the U.S. treasury does not spend as per a bank*. Political Economy Research Institute, Working Paper No. 279.
- FLASSBECK, H. y LAPAVITSAS, C. (2013): *The systemic crisis of the euro. True causes and effective therapies*. Studien Rosa Luxemburg Stiftung
- FLORIO, A. y GHIANI, G. (2015): *The regime-dependent nature of twin deficits: long-run relation and short-run dynamics across boom and busts*. 56th Annual Conference 96 University Parthenope, Naples, Aula A.2.5.
- FORNI, L., MONTEFORTE, L. y SESSA, L. (2009): The general equilibrium effects of fiscal policy: estimates for the euro area. *Journal of Public Economics* 93, 559-585.
- FORNI, L. y NOVTA, N. (2014): *Public employment and compensation reform during times of fiscal consolidation*. IMF Working Paper No. 14/192.
- FOUNTAS, S. y TSOUKIS, C. (2000): *Twin deficits, real interest rates and international capital mobility*. Working Paper No. 49. Department of Economics, National University of Ireland, Galway.
- FRIEDMAN, B. M. (1978): Crowding out or crowding in? the economic consequences of financing government deficits. *Brookings Papers on Economic Activity* 3, 593-654.
- FRIEDMAN, M. (1957): *A theory of the consumption function*. Princeton, N. J.: Princeton University Press.
- GARZÓN, A. y GUAMÁN, A. (eds.) (2015): *El Trabajo Garantizado: una propuesta necesaria frente al desempleo y la precarización*. Madrid: Akal.
- GAVILÁN, A., HERNÁNDEZ DE COS, JIMENO, J.F y ROJAS, J.A (2011): *Fiscal policy, structural reforms and external imbalances: a quantitative evaluation for Spain*. Banco de España Documentos de Trabajo No. 1107.
- GECHERT, S. (2015): What fiscal policy is most effective? A metaregression analysis. *Oxford Economic Papers* 67 (3), 553-580.
- GECHERT, S. y RANNENBERG, A. (2014): *Are fiscal multipliers regime-dependent? A meta regression Analysis*. IMK Working Paper 139/2014.
- GHOSH, A. (1995): Intertemporal tax-smoothing and the government budget surplus: Canada and the United States. *Journal of Money, Credit, and Banking* 27(4), 1033-1045.
- GIAVAZZI, F., JAPPELLI, T. y PAGANO, M. (2000): Searching for non-linear effects of fiscal policy: evidence from industrial and developing countries. *European Economic Review* 44 (7), 1259-1289.
- GIAVAZZI, F. y PAGANO, M. (1990): Can severe fiscal contractions be expansionary? Tales of two small European countries. *NBER Macroeconomics Annual* 5, 75-111.
- GIAVAZZI, F. y PAGANO, M. (1996): Non-Keynesian effects of fiscal policy changes: international evidence and the Swedish experience. *Swedish Economic Policy Review*, 75-111.
- GIUDICE, G., TURRINI, A. y IN'TVELD, J. (2003): *Can fiscal consolidations be expansionary in the EU? Ex-post evidence and ex-ante analysis*. European Commission Economic Papers No. 195.
- GLÖTZL, F. y REZAI, A. (2018): A sectoral net lending perspective on Europe. *Cambridge*

Journal of Economics 42, 779-795.

GODLEY, W. y CRIPPS, F. (1983): *Macroeconomics*. Oxford: Oxford University Press.

GORDON, W. (1997): Job Assurance: The Job Guarantee Revisited. *Journal of Economic Issues* 21 (3), 817-825.

GÓRNICKA, L., KAMPS, C., KÖSLER, G. y LEINER-KILLINGER, N. (2018): *Learning about fiscal multipliers during the European sovereign debt crisis: evidence from a quasi-natural experiment*. ECB Working Paper Series No. 2154.

GRAZIANI, A. (1990): The Theory of the Monetary Circuit. *Economies et Sociétés* 24 (6), 7-36.

GROS, D. y MAURER, R. (2012): Can austerity be self-defeating? *Intereconomics* 47 (3), 177-184.

GUAJARDO, J., LEIGH, D., PESCATORI, A. (2011): *Expansionary austerity: new international evidence*. International Monetary Fund, Working Paper WP/11/158, Washington D.C.

HALL, R. E. (1980): Labor supply and aggregate fluctuations. *Carnegie-Rochester Conference Series on Public Policy* 12, 7-33.

HALL, R. E. (2009): By how much does GDP rise if the government buys more output? *Brookings Papers Economic Activity* 2, 183-231.

HANSGEN, G. y PAPANITRIOU, D. B. (2012): Fiscal traps and macro policy after the Eurozone crisis. Levy Economics Institute of Bard College Public Policy Brief No. 127.

HEIN, E. y DETZER, D. (2014): Post-Keynesian alternative policies to curb macroeconomic imbalances in the Euro Area. *Panoeconomicus* 62 (2), 217-236.

HERNÁNDEZ DE COS, P. y MORAL-BENITO, E. (2016): Fiscal multipliers in turbulent times: the case of Spain. *Empirical Economics* 50, 1589-1625.

HERNÁNDEZ DE COS, P., LÓPEZ, D. y PÉREZ, J. J. (2018): *Los retos del despalancamiento*. Banco de España Documentos ocasionales No. 1803.

INNES, A. M. (2004) [1913]: What is money. En Wray, L. R. (ed.) *Credit and State Theories of Money* (pp. 14-49). Cheltenham: Edward Elgar.

ISLAM, M. F. (1998): Brazil's twin deficits: an empirical examination. *Atlantic Economic Journal* 26, 121-128.

JONG, J., FERDINANDUSSE, M. FUNDA, J. y VETLOV, I. (2017): *The effect of public investment in Europe: a model-based assessment*. European Central Bank Working Paper Series No. 2021.

JUNIPER, J. y MITCHELL, W. (2008): *There is no financial crisis so deep that cannot be dealt with by public spending*. Centre of Full Employment and Equity Working Paper No. 08-10.

JUNIPER, J., SHARPE, T. P. y WATTS, M. J. (2014): Modern monetary theory: contributions and critics. *Journal of Post Keynesian Economics* 37 (2), 281-307.

KAHN, R. F. (1931): The relation of home investment to unemployment. *Economic Journal*, 41 (162), 173-198

KALOU, S. y PALEOLOGOU, S-M. (2012): The twin deficits hypothesis: revisiting an EMU country. *Journal of Policy Modeling* 34, 230-241.

KARAGOUNIS, K., SYRRAKOS, D., y SIMISTER, J. (2015): The stability and growth pact, and balanced budget fiscal stimulus: evidence from Germany and Italy. *Intereconomics: Review of European Economic Policy* 50 (1), 32-9.

KARRAS G. (2013): Is fiscal policy more effective during cyclical downturns? *International Economic Journal* 1-18

KATARYNIUK, I. y VALLÉS, J. (2015): *Fiscal consolidation after the Great Recession: the role of composition*. Banco de España Documentos de Trabajo No. 1515.

- KAUFMANN, S., SCHARLER, J. y WINCKLER, G. (2002): The Austrian current account deficit: driven by twin deficits or by intertemporal expenditure allocation? *Empirical Economics* 27, 529-542.
- KEARNEY, C. y MONADJEMI, M. (1990): Fiscal policy and current account performance: international evidence on the twin deficits. *Journal of Macroeconomics* 12 (2), 197-219.
- KEYNES, J. M. (1964) [1936]: *The General Theory of Employment, Interest and Money*. New York: Harcourt Brace Jovanovich.
- KHALID, A. M. y GUAN, T. W. (1999): Causality tests of budget and current account deficits: cross-country comparisons. *Empirical Economics* 24, 389-402.
- KILPONEN, J., PISANI, M. y SCHMIDT, S. (2015): Comparing fiscal multipliers across models and countries in Europe. ECB Working Paper No. 1760.
- KIM, K. (1995): On the long-run determinants of the U.S. trade balance: a comment. *Journal of Post Keynesian Economics* 17 (3), 447-455.
- KIM, S. y ROUBINI, N. (2008): Twin deficit or twin divergence? Fiscal policy, current account, and real exchange rate in the U.S. *Journal of International Economics* 74, 362-383.
- KIRCHNER, M., CIMADOMO, J. y HAUPTMEIER, S. (2010): Transmission of government spending shocks in the euro area: Time variation and driving forces. ECB Working Paper No. 1219.
- KNAPP, G. F. (1924): *The State Theory of Money*. London: MacMillan & Company Limited.
- KOCHIN, L. A. (1974): Are future taxes anticipated by consumers? *Journal of Money, Credit, and Banking* 6, 385-94.
- KOUASSI, E., MOUGOUÉ, M. y KYMN, K. O. (2004): Causality tests of the relationship between the twin deficits. *Empirical Economics* 29, 503-525.
- KRUGMAN, P. (2019): *What's wrong with functional finance? (Wonkish)*. The New York Times. Disponible en <https://www.nytimes.com/2019/02/12/opinion/whats-wrong-with-functional-finance-wonkish.html?module=inline>. Último acceso el 3 de abril de 2019.
- KUMAR, M.S. y WOO, J. (2010): *Public debt and growth*. IMF Working Papers 10/174.
- LALIK, M. (2017): *Interactions between fiscal multipliers and sovereign risk Premium during fiscal consolidation: model based assessment for the euro area*. ECB Working Paper Series No. 2016.
- LAMO, A., PÉREZ, J.J. y SCHUKNECHT, L. (2012): Public or private sector wage leadership? An international perspective. *Scandinavian Journal of Economics* 144, 228-244.
- LAMO, A., MORAL-BENITO, E. y PÉREZ, J.J. (2016): *Does slack influence public and private labor market interactions?* ECB Working Paper Series No. 1890.
- LAVOIE, M. (2013): The monetary and fiscal nexus of neo-chartalism: a friendly critique. *Journal of Economic Issues* 47 (1), 1-31.
- LEACHMAN, L. L. y FRANCIS, B. (2002): Twin deficits: apparition or reality? *Applied Economics* 34 (9), 1121-1132.
- LERNER, A. P. (1941): The economic steering wheel: the story of the people's new clothes. *University Review (University of Kansas City)* 7(4), 257-65.
- LINDQUIST J. y VILHELMSSON, R. (2006): Is the Swedish central government a wage leader? *Applied Economics* 38, 1617-1625
- LINNEMANN, L. (2009): Macroeconomic effects of shocks to public employment. *Journal of Macroeconomics*, 31, 252-267.
- LOCAMO, A., NOTARPIETRO, A. y PISANI, M. (2013): *Sovereign risk, monetary policy and fiscal multipliers: a structural model-based assessment*. Bank of Italy Working Paper No. 943.
- LUCAS, R. Jr. (1972): Expectations and the neutrality of money. *Journal of Economic Theory* 4, 103-124.

- LUCAS, R. Jr. (1973): Some international evidence on output-inflation tradeoffs. *American Economic Review* 63, 326-334.
- LUDVIGSON, S. (1996): The macroeconomic effects of government debt in a stochastic growth model. *Journal of Monetary Economics* 38, 25–45.
- MARINHEIRO, C. F. (2008): Ricardian equivalence, twin deficits, and the Feldstein-Horioka puzzle in Egypt. *Journal of Policy Modeling* 30, 1041-1056.
- MASTROMATTEO, G. y ROSSI, S. (2015): The economics of deflation in the euro area: a critique of fiscal austerity. *Review of Keynesian Economics* 3 (3), 336-350.
- MCDERMOTT, C.J. y WESTCOTT, R.F. (1996): An empirical analysis of fiscal adjustment. IMF Staff Papers 43, 725-53.
- MEDINA, S. (2016): *El leviatán desencadenado: siete propuestas para el pleno empleo y la estabilidad de precios*. Berlín: Lola Books.
- MICHAILLAT, P. (2012): *Fiscal multipliers over the business cycle*. Centre for Economic Performance Discussion Paper No. 1115.
- MUÑOZ DE BUSTILLO, R. (2014): Questioning the myth of expansionary austerity: European macroeconomic policy during the crisis and its aftermath. En BILBAO-UVILLOS, J. (ed.) *The Economic Crisis and Governance in the European Union* (pp. 134-154). New York: Routledge.
- MILLER, S. M. y RUSSEK, F. S. (1989): Are the twin deficits really related? *Contemporary Policy Issues* 7, 91-115.
- MINSKY, H. P. (2008) [1986]: *Stabilizing an Unstable Economy*, New York: McGraw-Hill.
- MITCHELL, W. y WATTS, M.J. (1997): The path to full employment. *Australian Economic Review*, 4th Quarter.
- MITCHELL, W. y MUYSKEN, J. (2008): *Full employment abandoned: shifting sands and policy failures*. Centre of Full Employment and Equity Working Paper No. 08-01.
- MITCHELL, W. (2015): *Eurozone Dystopia. Groupthink and Denial on a Grand Scale*. Cheltenham: Edward Elgar.
- MITCHELL, W., WRAY, L. R. y WATTS, M. (2016): *Modern Monetary Theory and Practice. An Introductory Text*. Callaghan: Centre of Full Employment and Equity, The University of Newcastle.
- MITCHELL, W., WRAY, L. R. y WATTS, M. (2019): *Macroeconomics*. New York: Red Globe Press.
- MITNIK S. y SEMMLER, W. (2012.): Regime dependence of the fiscal multiplier. *Journal of Economic Behavior and Organization* 83(3), 502– 522.
- MODIGLIANI, F. y BRAMBERG, R. (1954): Utility analysis and the consumption function: an interpretation of cross-section data. En KURIHARA, K. (ed.) *Post Keynesian economics*. New Brunswick.
- MOSLER, W. (2014): *Seven Deadly Innocent Frauds of Economic Policy*. Valance Co. Inc.
- MOSLER, W. y FORSTATER, M. (2004): *The natural rate of interest is zero*. Working Paper No. 37.
- MOUNTFORD, A. y UHLIG, H. (2009): What are the effects of fiscal policy shocks? *Journal of Applied Econometrics* 24(6), 960–992.
- MULHEIRN, I. (2012): *Osborne's Choice: Combining Fiscal Credibility and Growth*. London: Social Market Foundation
- MÜLLER, G.J. (2013): Fiscal austerity and the multiplier in times of crisis. *German Economic Review* 15(2), 243-258.
- MURRAY, M. (2013): Effective demand, Technological change, and the Job Guarantee Program. En MURRAY, M. y FORSTATER, M. (eds) *The Job Guarantee. Toward True Full Employment*. Nueva York: PalgraveMac Millan

- MURRAY, M. y FORSTATER, M. (eds. 2013): *The Job Guarantee. Toward True Full Employment*. Nueva York: PalgraveMac Millan
- NERSISYAN, L. y WRAY, L. R. (2016): Modern Money Theory and the facts of experience. *Cambridge Journal of Economics* 40, 1297–1316.
- NICKEL, C. y TUDYKA, A. (2013): *Fiscal stimulus in times of high debt: reconsidering multipliers and twin deficits*. ECB Working Paper No. 1513.
- NIKIFOROS, M., CARVALHO, L. y SCHODER, C. (2015): “Twin deficits” in Greecer: in search of causality. *Journal of Post Keynesian Economics* 38 (2), 302-330.
- NIKIFOROS, M. (2016): A nonbehavioural theory of saving. *Journal of Post Keynesian Economics* 39 (4), 562-592.
- OWYANG, M. T., RAMEY, V. A., y ZUBAIRY, S. (2013): *Are government spending multipliers greater during periods of slack? Evidence from 20th century historical data*. Nber working papers, National Bureau of Economic Research, Inc.
- PANIZZA, U. y PRESBITERO, A.F. (2012): *Public debt and economic growth: Is there a causal effect?* POLIS Working Papers No. 168.
- PAPADIMITROU, D. B. y WRAY, L. R. (1998): *What to do with the surplus: fiscal policy and the coming recession*. The Levy Economics Institute of Bard College Policy Note No. 1998/6.
- PAPADIMITROU, D. B., NIKIFOROS, M. y ZEZZA, G. (2013): *The Greek economic crisis and the experience of austerity: a strategic analysis*. Levy Economics Institute of Bard College Strategic Analysis July.
- PAPADIMITROU, D. B., NIKIFOROS, M. y ZEZZA, G. (2018): *Can Greece grow faster?* Levy Economics Institute of Bard College Strategic Analysis November.
- PAREDES, J., PEDREGAL D. J., y PÉREZ, J., J. (2009): A quarterly fiscal database for the Euro area based on intra-annual fiscal information. ECB Working Paper Series No. 1132.
- PARGUEZ, A. y SECCARECCIA, M. (2000): The credit theory of money: the monetary circuit approach. En SMITHIN, J. (ed.), *What is Money?* (pp. 101-123). London: Routledge.
- PARKER, J. A. (2011): On measuring the effects of fiscal policy in recessions. *Journal of Economic Literature* 49 (3), 703-718.
- PEROTTI, R. (1999): Fiscal Policy in Good Times and Bad. *Quarterly Journal of Economics* 114 (4), 1399–1436.
- PRIFTIS, R. y ZIMIC, S. (2018): Sources of borrowing and fiscal multipliers. European Central Bank, Working Paper Series No. 2209.
- QAZIZADA, W. y STOCKHAMMER, E. (2015): Government Spending Multipliers in Contractions and Expansions. *International Review of Applied Economics* 29 (2), 238–258.
- RAGAN, C. T. S. (2013): *Economics*. Ontario: Pearson 14th Canadian edn.
- REINHART, C. y ROGOFF, K. (2009): *This Time is Different*. Princeton University Press.
- RODRÍGUEZ-ORTIZ, F. (2014): The European sovereign debt crisis and the new governance: a conservative alternative to European economic government. En BILBAO-UVILLOS, J. (ed.) *The Economic Crisis and Governance in the European Union* (pp. 134-154). New York: Routledge.
- RODRÍGUEZ-ORTIZ, F. (2016): Euro Zone: sucession of wrongly solved crises that questions both democracy and social cohesion. *Revista de Economía Mundial* 44, 153-172.
- ROGOFF, K. (2019): *Modern monetary nonsense*. Project Syndicate. Available at <https://www.project-syndicate.org/commentary/federal-reserve-modern-monetary-theory-dangers-by-kenneth-rogooff-2019-03>. Accessed 3 April, 2019.
- SALVATORE, D. (2006): Twin deficits in the G-7 countries and global structural imbalances. *Journal of Policy Modeling* 28, 701-712.
- SAMUELSON, P. (1948): *Economics: An Introductory Analysis*. New York: McGraw-Hill.

- SARGENT, T. y WALLACE, N. (1975): "Rational Expectations", the Optimal Money Instrument and the Optimal Money Supply Rule. *Journal of Political Economy* 83 (2), 241–54.
- SAWYER, M. (2011): Progressive approaches to budget deficits. En ONARAN, O., NIECHOJ, T., STOCKHAMMER, E., TRUGER, A. y VAN TRECJ, T. (eds.) *Stabilising an unequal economy? Public debt, financial regulation, and income distribution* (pp. 143-159). Marburg: Metropolis Verlag.
- SAWYER, M. (2018): *Six simple propositions on budget deficits, public debt and money*. University of Leeds.
- SEIDMAN, L. (2012): Keynesian stimulus versus classical austerity. *Review of Keynesian Economics*. Inaugural Issue, 77–92.
- SEMIENIUK, G., VAN TRECJ, T. y TRUGER, A. (2011) *Reducing economic imbalances in the Euro Area: some remarks on the current stability programs, 2011-14*. Levy Economics Institute Working Paper No. 694.
- SHEN, W. y YANG, S.-C. (2012): *The effects of government spending under limited capital mobility*. IMF Working Papers No. 129, International Monetary Fund.
- STÄHLER, N. y THOMAS, C. (2011): FIMOD: a DSGE model for fiscal policy simulations. Banco de España Documentos de Trabajo No. 1110.
- STEHN, S. (2012): *The fiscal multiplier at the zero bound*. *US Economic Analyst*. Goldman Sachs Global ECS Research No. 12/13.
- STEPANYAN, A. y LEIGH, L. (2015): *Fiscal policy implications for labor market outcomes in middle income countries*. IMF Working Paper No. 15/17.
- STIGLITZ, J. (2010): *Freefall: America, Free Markets, and the Sinking of the World Economy*. New York: Norton.
- STOCKHAMMER, E. y SOTIROPOULOS, D. (2012): *Rebalancing the Euro area: the costs of internal devaluation*. Post Keynesian Economics Study Group Working Paper No. 1206.
- SUMMERS, L.H. (1988): Tax policy and international competitiveness. En FRENKEL, J. (ed.) *International Aspects of Fiscal Policies* (pp. 349–375). Chicago: University of Chicago Press.
- SUMMERS, L. (2019): *The left's embrace of modern monetary theory is a recipe for disaster*. *The Washington Post*. Disponible en https://www.washingtonpost.com/opinions/the-lefts-embrace-of-modern-monetary-theory-is-a-recipe-for-disaster/2019/03/04/6ad88eec-3ea4-11e9-9361-301fb5bd5e6_story.html?noredirect=on&utm_term=.c7caa9133432. Último acceso el 3 de abril de 2019.
- TAYLOR, J. B. (1993): Discretion versus policy rules in practice. *Carnegie-Rochester Conference Series on Public Policy* 39, 195-214
- TCHERNEVA, P. (2011): The case for labor demand targeting. *Journal of Economic Issues* 45 (2), 401–9.
- TCHERNEVA, P. (2018): *The job guarantee: design, jobs, and implementation*. Levy Economics Institute Working Papers Series No. 902.
- TENEY, A. (2014): *Twin deficit or twin divergence? Extending Kim & Roubini (2008) to a panel of countries*.
- TYMOIGNE, E. (2014): Modern money theory, and interrelations between the treasury and central bank: the case of the United States. *Journal of Economic Issues* 48 (3), 641-662.
- TYMOIGNE, E. (2016): Government monetary and fiscal operations: generalising the endogenous money approach. *Cambridge Journal of Economics* 40 (5), 1317–1332
- TYMOIGNE, E. y WRAY, L. R. (2013) *Modern Money Theory 101: A Reply to Critics*. Working Paper No. 778. Levy Economics Institute of Bard College.
- UXÓ, J. y ÁLVAREZ, I. (2017): Is the end of fiscal austerity feasible in Spain? An alternative plan to the current Stability Programme (2015-2018). *Cambridge Journal of Economics* 41 (4),

999–1020.

UXÓ, J., ÁLVAREZ, I. y FEBRERO, E. (2018): Fiscal space on the Eurozone periphery and the use of the (partially) balanced-budget multiplier: The case of Spain. *Journal of Post Keynesian Economics* 41 (1), 99-125.

VAMVOUKAS, G. A. (1999): The twin deficits phenomenon: evidence from Greece. *Applied Economics* 31 (9), 1093-110.

VAN RIET, A. (2018) (ed.): *Euro area fiscal policies and the crisis*. ECB Occasional Paper No. 109.

VAN DER PLOEG, F. (2005): Back to Keynes? *CESifo Economic Studies* 51, 4, 777-822.

VON HAGEN, J., HALLET, A.H. y STRAUCH, R. (2001): Budgetary consolidation in EMU. Centre for Economic Policy Research Economic Paper No. 148.

VRANCEANU, R. y BESANCENOT, D. (2013): The spending multiplier in a time of massive public debt: the Euro-Area case. *Applied Economics Letters* 20(8), 758–762.

WARMEDINGER, T., CHECHERITA-WESTPHAL, C. y HERNÁNFEZ DE COS, P. (2015): *Fiscal multipliers and beyond*. ECB Occasional Paper No. 162.

WERNING, I. (2007): Optimal fiscal policy with redistribution. *The Quarterly Journal of Economics* 122(3), 925-977.

WOODFORD, M. (1990): Public debt as private liquidity. *American Economic Review* 80, 382-388.

WOODFORD, M. (2011): Simple analytics of the government expenditure multiplier. *American Economic Journal: Macroeconomics* 3 (1), 1–35.

WRAY, R.L. (1997): *Government as employer of last resort: full employment without inflation*. Levy Economics Institute Working Paper No. 213.

WRAY, R. L. (2012a): *Modern Money Theory: A Primer on Macroeconomics for Sovereign Monetary Systems*. London: Palgrave MacMillan.

WRAY, R. L. (2012b): *Imbalances? What imbalances? A dissenting view*. Levy Economic Institute of Bard College. Working Paper No. 704.

WRAY, R. L. (2018): *A better way to think about the “twin deficits”*. Multiplier Effect: The Levy Economics Institute Blog. Disponible en <http://multiplier-effect.org/a-better-way-to-think-about-the-twin-deficits/?fbclid=IwAR0hxo0jw8JjKoKGXjXSQdM5dOQxnEnC1CZDocPGwVervyS7ri0smVIWgkw>. Último acceso el 3 de abril de 2019.

WREN-LEVIS, S. (2011): Lessons from failure: fiscal policy, indulgence and ideology. *National Institute Economic Review* No. 217 (1), 31-46.

DEFINICIÓN DE UN SISTEMA DE INDICADORES PARA LA MEDICIÓN DE LA CALIDAD DEL EMPLEO TURÍSTICO COMO FUENTE DE VENTAJA COMPETITIVA EMPRESARIAL Y REDISTRIBUCIÓN TERRITORIAL DE LA RIQUEZA

MANUEL GONZÁLEZ DE LA ROSA

Facultad de Economía, Empresa y Turismo/Departamento de Dirección de Empresas e Historia Económica/Universidad de La Laguna. Campus de Guajara, s/n, 38071. La Laguna, Tenerife. Islas Canarias. España/mgonzale@ull.edu.es

FRANCISCO JAVIER GARCÍA RODRÍGUEZ

Facultad de Economía, Empresa y Turismo/Departamento de Dirección de Empresas e Historia Económica/Universidad de La Laguna. Campus de Guajara, s/n, 38071. La Laguna, Tenerife. Islas Canarias. España/fgarcia@ull.edu.es

JAVIER MENDOZA JIMÉNEZ

Facultad de Economía, Empresa y Turismo/Departamento de Economía Aplicada y Métodos Cuantitativos /Universidad de La Laguna. Campus de Guajara, s/n, 38071. La Laguna, Tenerife. Islas Canarias. España/jmendozj@ull.edu.es

MARÍA OLGA GONZÁLEZ MORALES

Facultad de Economía, Empresa y Turismo/Departamento de Economía Aplicada y Métodos Cuantitativos/Universidad de La Laguna. Campus de Guajara, s/n, 38071. La Laguna, Tenerife. Islas Canarias. España/olgonzal@ull.edu.es

e-mail Manuel González de la Rosa: mgonzale@ull.edu.es

Resumen

En los ámbitos regionales del espacio europeo integrado el éxito y supervivencia a largo plazo de la industria turística requerirá mejorar la competitividad de las empresas y garantizar que la riqueza que genera se redistribuya entre la población. Su productividad está condicionada por la calidad del empleo de uno de sus recursos más valiosos: los trabajadores, quienes a través de su esfuerzo pueden conseguir que se obtengan mejores resultados empresariales. Paralelamente, la medición de los efectos positivos del turismo sobre los mercados locales de trabajo, tanto desde una perspectiva cuantitativa como cualitativa, puede ser una de las mejores soluciones para comprobar si la actividad favorece los procesos de desarrollo endógeno.

Las islas Canarias se han afianzado como un valioso destino turístico que goza de un enorme reconocimiento internacional. Sin embargo, el Archipiélago presenta una de las mayores tasas de paro de la UE, empleos de baja calidad, así como un elevado riesgo de pobreza laboral y exclusión social. El objetivo del presente trabajo consiste en dar pasos dirigidos a confeccionar un sistema multidimensional de indicadores territoriales de diagnóstico del empleo turístico que, integrando los planteamientos propuestos por

organismos internacionales de referencia mundial en el ámbito laboral, sea viable técnicamente para su aplicación en contextos regionales.

La metodología a seguir conllevará realizar una selección de dimensiones e indicadores que puedan medirse, mantenerse en el tiempo y actualizarse periódicamente, permitiendo la comparación entre empresas, colectivos de trabajadores y regiones. Asimismo, deberá tener en cuenta las fuentes de datos que se pueden utilizar. Los resultados del estudio se traducirán en el diseño inicial de un panel de indicadores que, considerando el contexto del mercado laboral y las características de los puestos de trabajo desempeñados, permita realizar una medición sectorial de la calidad del empleo existente en la actividad turística del territorio insular.

Palabras clave: Turismo, Calidad del Empleo, Indicadores, Sostenibilidad, Islas Canarias.

Eje Temático 4: Economía Sectorial y de Servicios

Abstract

Long term success and survival of tourism at regional level in the European integrated space will require to improve businesses' competitiveness and to guarantee a fair distribution of generated wealth among the local population. Tourism's productivity is linked to employment quality and the efforts of workers to achieve better results. At the same time, measuring the positive effects of tourism on local employment markets, both quantitative and qualitative, could be one of the best solutions to assess whether this activity favours the endogenous growth processes.

The Canary Islands have become a valuable tourism destination, widely recognized internationally. However, the archipelago suffers one of the highest unemployment rate in the EU, and faces low quality employment and a high percentage of population at risk of exclusion and with low labor qualification. The aim of this study is to pave the way to build a multidimensional system of territorial indicators to evaluate tourism employment, integrating already in place mechanisms, developed by international institutions, to ensure its applicability in regional contexts.

The methodology will include the selection of the dimensions and indicators that could be measurable, sustained in time and updated periodically. Thus, allowing comparisons among enterprises, workers' collectives and regions. As well, the different data sources shall be taken into account. The results of the study will lead to the design of a panel of indicators which, considering the labour market context and the characteristics of the working positions, will allow measuring the tourism's employment quality in the island area.

Key Words: Tourism, Employment Quality, Indicators, Sustainability, Canary Islands.

Thematic axe 4: Sector and Service Economy

1. INTRODUCTION

El mercado laboral del siglo XXI plantea numerosos desafíos a las empresas y sus trabajadores. La continua expansión de las actividades de servicios es una característica básica de las regiones más desarrolladas. Están en permanente crecimiento y representan la mayor parte de su PIB total. Tienen una enorme incidencia en los mercados territoriales de trabajo, empleando, de manera directa e indirecta, en torno a tres de cada cuatro personas ocupadas.

La especialización productiva es esencial cuando se analiza la capacidad de una región para crecer, generar empleo y redistribuir la riqueza. Podría ser un factor explicativo del desarrollo económico regional y la posible convergencia o reducción de las disparidades entre diferentes ámbitos geográficos (Cuadrado, 2001). En ese sentido, existe cierto consenso general en lo relativo a que es recomendable profundizar en el conocimiento de los problemas a un nivel regional o local para encontrar respuestas orientadas a mejorar y promover el adecuado desarrollo de actividades productivas que favorezcan la creación y mantenimiento de puestos de trabajo de calidad, que sean competitivos y sostenibles a lo largo del tiempo.

La productividad es fundamental para entender el crecimiento económico regional y su capacidad de generación de riqueza. El informe "*Compendium of Productivity Indicators*" (OCDE, 2019) refleja que en España está estancada desde hace dos décadas y que, durante los últimos 40 años, la mejoría ha sido muy leve. Su crecimiento se ha basado en la incorporación extensiva de trabajo y capital y no en un óptimo aprovechamiento de esos recursos. De hecho, desde 1995, únicamente hay tres grandes países de la OCDE en los que la productividad multifactorial ha caído: Grecia, España e Italia. Como es sabido, la "Productividad Multifactorial (PMF)" mide la eficiencia general con la que son usados los factores productivos en el proceso de producción y su mejora es consecuencia de cambios en los modelos de gestión y organizativos, una adecuada gestión del conocimiento, los ajustes de costes y aprovechamiento de economías de escala, la conformación de redes colaborativas y la generación de sinergias, entre otros factores explicativos.

De esa manera, se constata que los sectores que generan mayor valor añadido, buenos salarios, beneficios más altos, mejor resistencia a los ciclos económicos depresivos, así como puestos de trabajo de alta productividad, están perdiendo peso en la economía. Entre las causas parecen encontrarse el reducido tamaño de las empresas, el insuficiente nivel de inversión y su escasa calidad, una rígida regulación que no incentiva la innovación y el emprendimiento, el deficiente nivel formativo de empresarios y trabajadores, y un mercado laboral que no responde a las necesidades de empresarios y trabajadores. Todo ello se traduce en empresas ineficientes, empleo precario, de baja calidad y salarios reducidos. Si el empleo se crea en industrias de baja productividad y escaso valor añadido, se podría incurrir en un mayor riesgo de entrar en un negativo círculo vicioso.

El turismo es un sector clave en la economía española, a la que contribuye con el 11,2% del PIB y el 13,3% del empleo nacional. Su carácter estratégico se acentúa por su transversalidad y gran efecto de arrastre sobre el resto de las actividades productivas, además de impulsar la cohesión territorial (Exceltur, 2018). Las empresas relacionadas con el turismo se ven afectadas por una serie de factores estructurales que son intrínsecos a la propia actividad y que condicionan

enormemente el empleo que se genera. La comprensión de esos factores es indispensable para valorar el potencial del turismo como sector creador de empleo estable y de calidad frente a otras actividades económicas, así como su contribución a la generación de prosperidad y cohesión territorial.

El capital humano es considerado como un recurso intangible crítico en la mayoría de las organizaciones (Pfeffer, 1994). La competitividad de la empresa turística depende, en gran medida, del factor trabajo. Su productividad y resultados están condicionados por la calidad del empleo que experimenta su fuerza laboral. Uno de los recursos más valiosos de las organizaciones son sus trabajadores, quienes a través de su esfuerzo logran que éstas obtengan mejores resultados empresariales. En una economía enormemente competitiva, los nuevos procesos de generación de valor pasan, inevitablemente, por un trabajo de calidad.

Sin embargo, frecuentemente, la industria turística es cuestionada por la existencia de una alta incidencia de empleo temporal y a tiempo parcial; abundancia de mano de obra con bajo nivel educativo; jornadas laborales prolongadas con horarios irregulares; aumento de la externalización y subcontratación; remuneración insuficiente a través de bajos salarios; y condiciones laborales deficientes; entre otras. La actividad se ve afectada por una creciente competencia, así como aceleradas transformaciones tecnológicas y organizativas. Ello ejerce una constante presión para que las empresas generen ambientes de trabajo justos y cuenten con empleados productivos que garanticen la oferta de servicios de alto nivel competitivo.

La preocupación sobre la cantidad y la calidad del trabajo de la industria turística está adquiriendo progresivamente un mayor protagonismo en el ámbito de la investigación académica. La calidad del empleo se refiere a los diversos factores que tienen un impacto directo sobre la productividad de las empresas, el bienestar de los trabajadores, el desarrollo equilibrado de las regiones y la vida de las personas que las habitan. Combina un amplio conjunto de dimensiones que están vinculadas con el propio puesto de trabajo, su entorno y las relaciones laborales.

Aunque los mercados laborales de algunas de las regiones más turísticas de la UE poseen un enorme potencial, muestran evidencias de especialización en actividades de servicios de baja productividad y presentan importantes carencias en lo relativo a altas tasas de paro registrado, deficiente calidad del empleo, así como elevados niveles de pobreza laboral, marginación y exclusión social. Ello puede ocasionar a largo plazo una mayor divergencia con respecto a regiones especializadas en servicios empresariales intensivos en conocimiento, de mayor valor añadido que proporcionan ventajas competitivas sostenibles en el tiempo.

Durante estos últimos años, muchos países de Europa han rozado el pleno empleo. Por el contrario, otros espacios geográficos han alcanzado tasas de paro inadmisibles que han convivido con reducidos niveles de empleo decente y pobreza laboral. Esa polarización en la situación de desigualdad se ha cebado en los colectivos más desfavorecidos: jóvenes, mujeres, desempleados de larga duración, discapacitados, inmigrantes, minorías étnicas, etc. Lógicamente, si las diferencias no se recortan, los resultados a medio plazo serán insostenibles.

En el presente trabajo, tras esta introducción, se hace una reflexión sobre la importancia de analizar el mercado laboral desde una perspectiva de especialización productiva regional con la finalidad de medir su capacidad para

vertebrar y generar desarrollo endógeno, riqueza y empleo de calidad, destacando el protagonismo que tiene la industria turística de las islas Canarias en Europa. Seguidamente, se realiza un razonamiento sobre los impactos positivos y negativos que puede producir el turismo sobre los ámbitos regionales en los que tiene una importante implantación. Posteriormente, como eje central del trabajo, se hace una valoración sobre la necesidad de definir indicadores que permitan medir la calidad del empleo turístico regional desde una perspectiva sostenible e integradora. Se realiza una revisión de algunos de los principales planteamientos de referencia a nivel internacional, planteando una propuesta que éste en armonía con las visiones de la Organización Mundial del Turismo (OMT), la Organización Internacional del Trabajo (OIT) y la Agenda 2030 de Desarrollo sostenible. Finalmente, se presentan las conclusiones.

2. EL ANÁLISIS DEL EMPLEO TURÍSTICO DESDE UNA PERSPECTIVA REGIONAL

En la actividad turística es especialmente relevante la importancia del ámbito local (Dredge, 1999; Pearce, 2001; Lew y Mckercher, 2006). El turismo tiene la capacidad de favorecer el crecimiento y contribuir al desarrollo regional gracias a la actividad de las pequeñas y medianas empresas, que son una importante fuente de innovación y diversificación económica, estimulando la creación de empleos, en particular para las mujeres y los jóvenes, así como promoviendo el desarrollo socioeconómico inclusivo y, por consiguiente, reduciendo la pobreza.

La teoría del desarrollo endógeno sitúa la discusión del incremento sostenido de la productividad en ámbito territorial regional o local (Garofoli, 1986; Scott, 1988; Storper y Harrison, 1992; Méndez, 1994; Bellandi, 1996; Di Pietro 1999; Nelson, 1999; Vázquez Barquero, 2002; Alonso y otros, 2004; Gaigné y otros, 2005; Rubiera, 2005; Pólese y Shearmur, 2006; Scott y Garofoli, 2007; entre otros). El desarrollo endógeno se concibe como un proceso de crecimiento y cambio estructural que, mediante la utilización eficiente del potencial de desarrollo existente en el territorio, lleva a la mejora del bienestar de la población de una localidad o región (Vázquez Barquero, 2000). Asimismo, conlleva la necesidad de incrementar la productividad en los diferentes sectores de actividad, diversificando la producción local (Vázquez Barquero, 2005) y buscando la sustentación en el largo plazo (Boisier, 1993).

Desde esa perspectiva, Fua (1994) considera que para que el desarrollo sea sostenible y duradero, los factores como la capacidad empresarial y organizativa, la cualificación de la mano de obra y la instrucción de la población, son decisivos. Como señala Arocena (2001), el desarrollo endógeno combina la sostenibilidad económica con la social, ya que los actores públicos y privados toman las decisiones de inversión no sólo con la finalidad de mejorar la productividad y la competitividad de las empresas, sino también con el fin de resolver los problemas y mejorar el bienestar de la sociedad. Para Wang (2007), los actores locales han de asumir la función de hacer el sistema productivo más eficiente, promover la equidad y mejorar la calidad de vida de la población.

Durante la reciente crisis, se ha puesto de manifiesto que el empleo de los sectores productivos de los países y sus regiones no posee la misma capacidad de ajuste y supervivencia. Los efectos más negativos sobre el mercado de trabajo

han sido sufridos por aquellos espacios geográficos caracterizados por una estructura productiva asentada en actividades de baja productividad, reducida calidad del empleo, escaso valor añadido, y poco intensivas en conocimiento, como la construcción o el turismo, lo que es insostenible a largo plazo. Es el caso de los países y regiones del Sur y Este de Europa que presentan economías especializadas en actividades terciarias y han ido perdiendo gran parte de su capacidad industrial durante las últimas décadas (Vence, 2013). En el lado contrario, se encuentran algunas economías del centro y norte del espacio europeo integrado, cuya especialización está orientada tanto al sector industrial como a los servicios de mayor valor añadido.

Las islas Canarias se encuentran dentro del grupo de las regiones más desfavorecidas, en términos de empleo, lo cual no deja de sorprender teniendo en cuenta su boyante actividad turística. Si el turismo es una actividad que impulsa la actividad empresarial territorial en el sentido de que su crecimiento estimula el incremento de la demanda de bienes locales y del nivel económico del destino en general (Fullana y Ayuso, 2002), ¿por qué el territorio insular ha presentado niveles insostenibles de paro y pobreza laboral frente a otras regiones que están muy cerca del pleno empleo?. Dicho de otra manera, si la actividad turística es considerada una piedra angular de la economía de servicios, ¿por qué, en ocasiones, es señalada por generar empleos de baja calidad y no producir efectos redistributivos que redunden en el bienestar de la población local?

En las últimas décadas, el turismo ha jugado un papel fundamental en el cambio estructural y el crecimiento económico de las islas Canarias (Hernández Martín, 2004), que se han erigido como uno de los principales destinos turísticos del mundo, registrando aproximadamente 100 millones de pernoctaciones anuales en establecimientos alojativos (Eurostat, 2018), y situándose como la región más visitada de Europa. En 2017, el turismo aportó más del 35% al producto interior bruto (PIB) de la región. El número de turistas que visitaron las Islas alcanzó su record histórico, quedándose muy cerca de la barrera de los 16 millones. La industria turística ha sido la principal impulsora de la economía durante los últimos 10 años, con una media anual de crecimiento del 6,3%, alcanzando un peso del 35,2% del PIB total y aportando el 40,3% del conjunto del empleo de la región (Exceltur y Gobierno de Canarias, 2018).

Según el informe *"Impactur"* (Exceltur y Gobierno de Canarias, 2018), entre 2008 y 2017, el PIB generado por el turismo en Canarias se incrementó de 11.820 a 15.573 millones de euros, es decir, la riqueza aumentó un 32%. La mayor parte de ese crecimiento ha sido originado por el constante aumento en la llegada de turismo extranjero a las islas y la consiguiente mejora del gasto global realizado por esos visitantes. Así, los turistas extranjeros han pasado de ser 9,4 millones en 2008 a 14,5 millones en 2017. Sin embargo, durante el mismo período, el empleo generado por el bloque económico dependiente del turismo, que contempla tanto los puestos de trabajo directos como los indirectos y de asalariados y autónomos, también ha aumentado, pero solo el 3,2%.

De 2008 a 2017, con el gran motor de la economía de las islas generando el 32% más de recursos económicos, la creación de empleo solo benefició a 10.136 personas más. El PIB turístico ha pasado de acaparar el 24,6% de la economía regional en 2010 a un 35,2% en 2017. Por lo tanto, la dependencia de Canarias con respecto al turismo es mucho más acusada. También, la participación del

empleo turístico sobre el total de la comunidad ha seguido una senda continua de crecimiento, pasando del 29,5% en 2010 al 40,3% de 2017.

El turismo se ha comportado de manera brillante durante la crisis. En número de pernoctaciones anuales derivadas de la entrada de visitantes, el territorio insular se sitúa en la novena posición, por debajo de Reino Unido, España, Francia, Italia, Alemania, Austria, Holanda y Grecia y por encima de los otros 20 países que integran la UE28. A pesar de ello, si se realiza una comparativa entre la tasa de desempleo en 2018 con respecto a la tasa media conjunta de los países, el Archipiélago se encuentra en la primera posición, ascendiendo ésta al 20,1%, frente al 7% de media del espacio europeo integrado. Los porcentajes de desempleo dejan en clara evidencia que las diferencias entre los países del Norte de Europa en relación a los del Sur y Este son abismales. En 2018, una pequeña región de 2.188.626 habitantes presenta más personas en situación de paro que 16 de los países que ahora forman parte la Unión Europea (Eurostat, 2018).

Evidentemente, los condicionantes de las islas Canarias, como territorio fragmentado y región ultraperiférica de la Unión Europea, han agravado la situación, haciendo más frágil y vulnerable el empleo y provocando consecuencias negativas sobre el mercado de trabajo. La cuestión de fondo a valorar es que, reconociendo los enormes impactos positivos de la actividad turística, no debe ser casual que las economías más especializadas en esta actividad presenten unos mercados de trabajo tan deteriorados. Garantizar un empleo decente y sostenible puede ser la llave que impulse la convergencia territorial y, en esa materia, queda un largo camino por recorrer.

3. EL DEBATE SOBRE LOS EFECTOS POSITIVOS Y NEGATIVOS DEL DESARROLLO TURÍSTICO REGIONAL

Una gran parte de las regiones del Sur y Este de Europa han soportado un alarmante aumento del desempleo y la precariedad laboral durante la reciente crisis. Para abordar esa problemática, las políticas públicas están centrando la atención en cómo crear nuevos puestos de trabajo y mejorar la calidad del empleo en esos territorios.

Algunas de las principales instituciones internacionales están intentando aportar soluciones con la finalidad alcanzar un desarrollo convergente, incluyente y sostenible, que promueva la generación de empleo decente. En ese sentido, la medición cuantitativa y cualitativa de los efectos originados por la implantación de la actividad turística en muchos de esos mercados de trabajo regionales, podría aportar conocimiento para confirmar si esa industria es eficiente, aporta valor añadido, y contribuye a redistribuir la riqueza e impulsar los procesos de desarrollo endógeno.

En general, parece haber consenso en lo relativo a que el turismo promueve el dinamismo económico y produce efectos positivos en los ámbitos geográficos regionales (Valls, 1996; Figuerola, 2000; Ashley y otros, 2007; Weidenfeld y Hall, 2014; Sharpley y Telfer, 2014; Vanhove, 2015, entre otros). Se trata de una actividad exportadora de servicios que permite obtener ingresos directos y desencadena efectos indirectos sobre otros sectores productivos. Tiene una importante incidencia en la ordenación del territorio, estimula las inversiones, conlleva el desarrollo de las infraestructuras y servicios públicos, defiende el

cuidado medioambiental, y origina cambios socio-culturales. La actividad turística favorece el crecimiento de la demanda de bienes locales y del nivel económico del destino en general (Fullana y Ayuso, 2002), lo cual tiene consecuencias sobre la renta, la riqueza y el bienestar social. En definitiva, su aportación a la generación de Valor Añadido Bruto (VAB) en la región receptora potencia su desarrollo.

El sector turístico es complejo (Sharpley y Telfer, 2002), tanto por la gran diversidad de elementos que lo componen, como por las diferentes actividades económicas que involucra su desarrollo. Los gastos de los turistas originan un aumento de la demanda en la región receptora que beneficia a las empresas y personas vinculadas directamente, así como al resto de sectores de la economía, a través del denominado efecto multiplicador. La renta destinada al gasto turístico fomenta la actividad empresarial, aumenta los ingresos públicos e incide sobre el reparto de la renta, posibilitando que un porcentaje de la misma se reinvierta en nuevos gastos dentro de la propia economía local, mientras que otra parte sale fuera de esas fronteras.

El turismo es una industria que depende en gran medida del factor humano por lo que favorece la creación de empleo, tanto en actividades propias del sector como en otras relacionadas. Es un importante motor del desarrollo socioeconómico inclusivo y tiene un considerable potencial para estimular la creación de empresas. Entre sus aspectos positivos, uno de los más reconocidos es su gran capacidad para generar empleo entre los colectivos desempleados que tienen más dificultad a la hora de acceder al mercado de trabajo, como mujeres, inmigrantes y jóvenes con baja cualificación.

A nivel mundial, la mayoría de sus trabajadores tienen menos de 35 años de edad, la mitad de los cuales tienen 25 años o menos. Las mujeres representan entre el 60 y el 70 por ciento de la fuerza de trabajo turística y los trabajadores migrantes constituyen una gran proporción de los trabajadores del sector. Además, el turismo está firmemente posicionado en la Agenda 2030 para el Desarrollo Sostenible (Naciones Unidas, 2015). Su papel como vehículo para la creación de empleo, crecimiento económico y desarrollo ha sido reconocido por el G-20. Asimismo, la Asamblea General de las Naciones Unidas ha reconocido en el documento titulado El futuro que queremos, que es un contribuyente importante al desarrollo sostenible, mientras que el Programa de las Naciones Unidas para el Medio Ambiente (PNUMA) lo ha señalado como uno de los sectores que podrían liderar la transición hacia la economía verde (OIT, 2017a).

Sin embargo, la actividad turística puede ser cuestionada debido a los posibles efectos negativos que podría llegar a producir en las economías de los territorios en los que tiene una importante presencia (Valls, 1996; Fullana y Ayuso, 2002). Algunos de los argumentos que van en esa línea se refieren a su escasa capacidad redistributiva de la riqueza por perseguir beneficios privados, ignorar y perjudicar a las poblaciones locales y dañar el medio ambiente, no atendiendo adecuadamente a las necesidades inherentes al desarrollo sostenible. Sin duda, hay evidencias y argumentos suficientes para indagar sobre cuáles son las variables críticas que explican las causas de que el turismo aún no aporte todo su potencial al desarrollo territorial.

Jafari (2001) se refiere a la plataforma apologética, como aquella que afirma que la industria turística genera riqueza y mejora las condiciones de vida, destacando que se trata de una industria intensiva en trabajo; que beneficia a muchos sectores

económicos; se configura como una alternativa viable para muchas regiones y países; preserva el entorno natural y cultural; revive antiguas tradiciones; y facilita la comunicación intercultural y las expectativas de paz mundial.

Por otra parte, la plataforma precautoria, destaca lo negativo del turismo, subrayando los perjuicios económicos y morales que causa para la población anfitriona: la falta de beneficios económicos; la existencia de empleos mayoritariamente estacionales y de baja cualificación; el beneficio prioritario de las grandes empresas y corporaciones; la destrucción de la naturaleza; la conversión en mercancías de personas y culturas; y el desequilibrio de las sociedades de acogida. En ese sentido, Turner y Ash (1975) dudan de los beneficios que genera la actividad, cuestionando que mejore la estructura laboral de los países y regiones menos desarrolladas, al constatar que los puestos de trabajo están mal remunerados, son inseguros y de baja cualificación.

De manera complementaria, la plataforma adaptativa (Jafari, 2001) promueve la exploración y desarrollo de alternativas de turismo sostenible, favoreciendo aquellas modalidades especialmente respetuosas con las comunidades de acogida, el entorno sociocultural y su medio natural. Se configura como un conjunto de alternativas al turismo actual de masas, comercializado e incontrolado que se practica en casi todas partes.

El autor también distingue la plataforma científico-céntrica, que pretende proporcionar una base científica rigurosa que aborde, de manera objetiva, el estudio del turismo e integre, de forma equilibrada, los tres enfoques anteriores. Considera a la actividad turística como una industria de grandes dimensiones, que sirve a millones de clientes y genera tanto consecuencias deseables como no buscadas, otorgando especial relevancia a la relación coste-beneficio.

En los primeros años de siglo XXI se atisba una aún incipiente plataforma de interés público (Jafari, 2005), cuyo objetivo es que el turismo ocupe un lugar legítimo junto a las demás industrias. El papel de instituciones de alcance mundial como la Asamblea General de las Naciones Unidas (ONU), la Organización Mundial de Turismo (OMT), la Organización Internacional del Trabajo (OIT), etc., así como de los Gobiernos supranacionales, nacionales, regionales y locales, será muy relevante.

En lo relativo al mercado de trabajo, son abundantes los estudios que, aun reconociendo los impactos positivos del turismo sobre los ámbitos regionales, coinciden en que en la actividad hay una alta incidencia de trabajo informal; abundancia de mano de obra con bajo nivel educativo; condiciones laborales deficientes; elevada vulnerabilidad y riesgo de pobreza laboral, marginación o exclusión social; importantes porcentajes relativos de empleo temporal; fuerte implantación de empleo a tiempo parcial y otras formas atípicas de trabajo; jornadas laborales prolongadas y con horarios irregulares, por turnos y nocturnos; una elevada tasa de rotación y una protección social limitada. Asimismo, se constata un significativo aumento de la externalización y la subcontratación. A lo anterior se añaden las importantes fluctuaciones estacionales, una remuneración deficiente a través de bajos salarios; la creciente competencia, así como las transformaciones tecnológicas y organizativas, entre otras.

Todo lo anterior se traduce en empleos de baja calidad con el consiguiente empobrecimiento de la población local que reside en los espacios turísticos

regionales. Por ello, la industria del turismo y las principales instituciones internacionales tienen que afrontar el enorme reto de conseguir que esta actividad sea un eficaz instrumento para un desarrollo regional integrador, convergente e inclusivo.

4. LA FALTA DE CONSENSO SOBRE LA DEFINICIÓN DE INDICADORES DE SOSTENIBILIDAD

La definición de indicadores no es una tarea fácil sobre la que exista consenso universal en la literatura académica (Veleva y Ellenbecker, 2001). Los conceptos de indicadores, criterios, estándar, niveles y otros sinónimos suelen mezclarse cuando se intenta definir un sistema de medición para cualquier temática que pueda ser objeto de estudio, lo cual contribuye a favorecer la confusión.

En el campo de la sostenibilidad en general, y turística en particular, puede mantenerse, en gran medida, la afirmación realizada por Mitchell (1996), hace casi 25 años, acerca de una definición de indicadores orientada sobre todo a la escala nacional, que puede conllevar decisiones mal informadas a niveles regionales o locales. Ello no obsta para que en los últimos años exista una corriente de desarrollo de indicadores para la medición de la sostenibilidad turística a escala local. Por ejemplo, Mendoza y Hernández (2017) realizan una propuesta de indicadores que combina una parte internacional y otra local, mientras que Torres y Palomeque (2014) proponen un sistema con 26 indicadores sociales, económicos y medioambientales.

De manera más global, la iniciativa Measuring Sustainable Tourism (MST) de la Organización Mundial del Turismo (OMT), instrumentada con el apoyo de la División de Estadísticas de las Naciones Unidas (UNSD), ha puesto el foco en la dimensión territorial como una de las variables fundamentales para medir la sostenibilidad. La integración del turismo en los estándares de medición económicos, sociales y ambientales, tiene como objetivo primordial confeccionar una estructura organizativa que permita explotar la riqueza de datos disponible de manera más efectiva e integrada, facilitando la adopción de decisiones. Su instrumentación está orientada a mejorar la credibilidad, comparabilidad y divulgación de los diferentes programas de medición y seguimiento relacionados con el turismo sostenible, incluida la derivación de los indicadores de los Objetivos de Desarrollo Sostenible (ODS) y los de la Red Internacional de Observatorios de Turismo Sostenible (INSTO) de la OMT.

Debido a la gran de información que deben sintetizar los sistemas de información estadística sobre la sostenibilidad, y que puede llevar a una “superpoblación” de indicadores, la propuesta de indicadores compuestos ha ganado terreno en la medición de la sostenibilidad en la última década. De este modo, Pulido y Sánchez (2009) proponen un índice global de sostenibilidad turística que aplican a escala municipal y Navarro y otros (2012) desarrollan un método para establecer los límites del crecimiento turístico en regiones costeras.

En cuanto a la metodología empleada, el método Delphi, que Linstone y Turoff (1975) definen más “como un arte que como una ciencia” ha sido elegido en multitud de ocasiones para afrontar la tarea de selección de los indicadores. Este método ha sido usado en campos tan diversos como los tratamientos clínicos (Stewart et al., 2016), la medición del rendimiento en la construcción (Luna y otros,

2017) o la competitividad de las compañías aéreas (Delbari y otros, 2016). A pesar de la falta de acuerdo global sobre cuáles son los indicadores que deberían usarse para evaluar la sostenibilidad, en el caso del turismo sí puede tomarse como referencia el documento elaborado por la Organización Mundial del Turismo (2004) que establece 12 pasos para el desarrollo, la implementación, el uso y la evaluación de indicadores para este campo (ver Tabla 1).

Tabla 1. Fases para el desarrollo de indicadores de sostenibilidad turística

Fase	Acción
Investigación y organización	Definición del Destino
	Uso del proceso participativo
	Identificación de los activos y riesgos turísticos
	Visión de largo plazo del Destino
Desarrollo	Selección de prioridades y preguntas políticas
	Identificación de los indicadores deseados
	Inventario de fuentes de datos
	Procedimiento de selección
Implementación	Evaluación de la viabilidad
	Recolección de datos y análisis
	Comprobación y comunicación
	Monitorización y evaluación de la implementación

Fuente: Elaboración a partir de (OMT, 2004)

Independientemente del método usado, sigue siendo necesario resolver la pregunta de qué características debe poseer un indicador para que sea relevante. Reduciendo al absurdo, podría concluirse que la función de un indicador es, como su propio nombre indica, indicar información relevante sobre los aspectos que los potenciales usuarios han definido a priori. Para cumplir tal función Valenzuela y otros (2016) establecen los requisitos de que los indicadores de sostenibilidad deben ser: simples e informativos; relevantes a las tres condiciones de la sostenibilidad; genéricos para toda la industria y sector turístico; y normalizados. Por su parte, el mencionado documento de la OMT (2004) establece cinco condiciones: relevancia; viabilidad; credibilidad de la información y las fuentes; claridad; y comparabilidad, tanto espacial como temporal.

Se han producido importantes avances para la medición del turismo en los ámbitos regionales. Las Recomendaciones Internacionales para Estadísticas de Turismo (2008) fueron elaboradas por la OMT, la Organización para la Cooperación y Desarrollo Económicos (OCDE), la Oficina Europea de Estadística (EUROSTAT), el Fondo Monetario Internacional (FMI) y la Organización Mundial del Comercio (OMC) (OMT, 2010a). La International Network on Regional Economics, Mobility and Tourism (INRouTe), surgió como una red de apoyo a la OMT, dirigida a mejorar la medición y desarrollar estadísticas turísticas de escala inferior a las nacionales, es decir, de nivel regional o local (INRouTe y OMT, 2012). Su documento "A Closer Look at Tourism: Sub-national Measurement and Analysis. Towards a Set of UNWTO Guidelines", tiene como finalidad principal la de orientar en la configuración de un Sistema de Información de Turismo a escala regional (R-TIS).

Desde la perspectiva de INRouTe, los datos e indicadores han de resaltar la importancia del turismo en el plano regional y fomentar la credibilidad de su medición; sentar las bases para un análisis más detallado; identificar los tipos principales de turismo; advertir sobre la vulnerabilidad de los destinos turísticos en relación con los diferentes componentes del desarrollo sostenible; promover la calidad uniforme de los datos para permitir la comparabilidad nacional e internacional entre regiones; y velar por que esa información se pueda obtener de forma periódica. Los conjuntos de datos generados deben cumplir las características de facilidad de recopilación, simplicidad, eficiencia, facilidad de comprensión, y credibilidad.

Las Recomendaciones internacionales para estadísticas de turismo, 2008 (OMT, 2010a) y “la Cuenta satélite de turismo: Recomendaciones sobre el marco conceptual, 2008” (OMT, 2010b) son referentes a escala internacional a la hora de diseñar los sistemas estadísticos nacionales. Tienen como objetivo ayudar a los países a establecer los fundamentos metodológicos y prácticos de las estadísticas de turismo de un modo integrado, aumentando su coherencia con respecto a otras estadísticas oficiales y velando por el desarrollo de las cuentas satélite de turismo (OMT, 2010a). Las recomendaciones de 2008 (OMT, 2010b) hacen mención a la necesidad de considerar la escala inferior a los estados en la elaboración de las estadísticas turísticas en algunos párrafos del apartado C del capítulo 8. El documento define las 12 actividades identificadas relacionadas con los 12 productos de consumo característicos del turismo. Esa clasificación de vital importancia para permitir la comparabilidad de las estadísticas turísticas. En ese sentido, una Cuenta Satélite de Turismo a escala regional se considera el primer paso para generar información estadística básica para regiones y otras agregaciones territoriales de menor tamaño.

5. EL DISEÑO DE INDICADORES PARA MEDIR LA SOSTENIBILIDAD DEL EMPLEO TURÍSTICO REGIONAL

Las regiones turísticas tienen la urgente necesidad de identificar con precisión cuales son los auténticos efectos del turismo sobre la productividad del tejido empresarial y la situación de sus mercados laborales. Sin duda, la existencia de una industria turística sólida, sostenible y competitiva, que genere un empleo de calidad, se traducirá en un aumento de la riqueza y del bienestar de la población.

Sin embargo, dadas las particularidades específicas del turismo, la definición y construcción de un panel de dimensiones e indicadores que, complementando a los ya existentes, permita efectuar una adecuada valoración y medición de la calidad del empleo, reviste una importante dosis de complejidad. Hay que tener en cuenta que la calidad del empleo combina un amplio conjunto de dimensiones que están vinculadas con el propio puesto de trabajo, pero también con el contexto laboral en que éste se desarrolla. Por una parte, se encuentran las dimensiones relativas a la calidad intrínseca del trabajo que incide en la satisfacción del empleado. Por otra, se han de contemplar otras dimensiones relevantes, como las relaciones sociales, la intensidad del trabajo, la formación permanente y oportunidades de reciclaje profesional, la cobertura del empleo, o la seguridad en el trabajo, entre otras. Además, no se pueden obviar aquellas que están

relacionadas con las características del mercado laboral y los procesos de transformación tecnológica.

La literatura que versa sobre la medición de la calidad del empleo ha tenido que afrontar dificultades en múltiples niveles (Burchell y otros, 2014). Las mediciones exitosas requieren disponer de fuentes de datos que sean fiables y comparables. Además, han de contemplar el nivel del mercado laboral a investigar porque no es lo mismo centrar el análisis en los trabajadores individuales, que hacerlo en los empleos en sí mismos, el marco regulatorio o el mercado laboral. Según sea el objeto de estudio, se generan diferentes requerimientos de datos y metodologías de medición.

También, ha de tenerse en cuenta que es complicado llegar a un acuerdo universal sobre lo que constituye un buen trabajo y no hay un conjunto simple de variables que lo puedan resumir. Muchas variables del mercado laboral son discutibles. En ese sentido, los intereses de los trabajadores, empleadores y responsables de las políticas públicas a menudo están enfrentados. La definición de un marco integral que tenga en cuenta las múltiples características del trabajo plantea especiales dificultades para los organismos internacionales, porque requiere llegar a un consenso. Ese es una de los principales motivos que originan que las iniciativas institucionales dirigidas a construir una metodología unánimemente aceptada para la medición de la calidad del trabajo hayan fracasado hasta ahora.

Desde una perspectiva regional, INRouTe considera que, teniendo en cuenta que el turismo se distribuye de manera desigual a lo largo del territorio nacional, es fundamental comprender mejor su desarrollo a escala subnacional para un diseño más eficiente de las políticas (INRouTe y OMT, 2012). El principal inconveniente es que no todos los niveles territoriales tienen el mismo tipo y cantidad de información estadística. Las fuentes no suelen producir información para todas las unidades administrativas, y los tamaños muestrales de las encuestas no permiten obtener datos fiables para todos los niveles territoriales.

Además, para conseguir la comparabilidad es imprescindible definir los límites de los destinos turísticos. Se trata de una cuestión clave a la hora de diseñar bases de datos que permitan la comparabilidad entre las escalas nacional y regional, y entre ésta y otras escalas subnacionales inferiores. Hay que tener en cuenta que los datos deben ser lo suficientemente robustos para permitir la comparabilidad, y esto se puede complicar cuando se obtienen en el ámbito local.

INRouTe propone, como primera iniciativa para el desarrollo de estadísticas turísticas a escala inferior a la nacional, la creación de un sistema regional de información turística que articule conjuntos de datos nacionales y regionales con información sobre las siguientes esferas primarias y secundarias de investigación: el turismo como sector económico; el turismo y el desarrollo sostenible (dimensión ambiental, impacto en las dimensiones social y cultural de la población residente, así como contribución e impacto económicos del turismo); desarrollo del turismo y cohesión territorial; y apoyo a los interesados clave de los destinos turísticos.

El trabajo de INRouTe se estructura en torno a un sistema de estadísticas turísticas a escala regional que incorpore no sólo estadísticas oficiales, sino además otra información relevante: la georreferenciación de la información regional con el fin de promover el análisis territorial del turismo, especialmente en

los niveles más desagregados; la cooperación con las autoridades regionales; la colaboración entre estadísticos y expertos en turismo con geógrafos y especialistas en ciencias sociales e investigadores ambientales; así como la creación de observatorios regionales de turismo que aborden aquellos temas que no son de interés para los organismos nacionales pero son cruciales para los destinos turísticos.

De manera complementaria, el Departamento de Estadística de la OIT ha adoptado como referencia para medir la situación del empleo a la novena edición de los Indicadores Clave del Mercado de Trabajo (KILM, 2015). En 2012, se encomendó al Departamento de Estadística que consolidará todas las bases de datos estadísticos de la OIT en la base ILOSTAT, sucesora de LABORSTA y de otras bases de datos publicadas por la OIT en el pasado. ILOSTAT es el mayor banco de estadísticas laborales del mundo, y abarca todas las esferas del trabajo de calidad. De esa manera, los KILM se basan en los datos declarados por los países a ILOSTAT, a los que se agregan los de fuentes estadísticas externas de otras organizaciones, como Eurostat, la OCDE, la UNESCO y el Banco Mundial. Dependen de datos comparables internacionalmente porque se ajustan a las normas estadísticas convenidas por la Conferencia Internacional de Estadísticos del Trabajo y sirven para medir la situación del empleo en cualquier sector de actividad.

Los KILM constan de una colección de 17 indicadores “clave” del mercado de trabajo, que captan los aspectos más importantes de los mercados laborales del mundo y comprenden el empleo y otras variables conexas (situación, actividad económica, ocupación, horas de trabajo, etc.), empleo en la economía informal, desocupación y perfil de las personas desocupadas, subocupación, educación, salarios y costos laborales, productividad laboral y trabajadores pobres. En conjunto, los indicadores KILM proporcionan una base sólida a partir de la cual abordar cuestiones fundamentales en torno al empleo productivo y el trabajo decente (ver Tabla 2).

Tabla 2. Indicadores KILM (2015)

1.- Tasa de participación en la fuerza de trabajo	Proporción de población en edad de trabajar de un territorio que participa activamente en el mercado de trabajo, porque trabaja en un empleo remunerado o se halla en plena búsqueda de empleo. Permite conocer el volumen relativo de la oferta de mano de obra disponible para participar en la producción de bienes y servicios. Su desglose por sexo y grupo de edad, proporciona el perfil de su distribución en un territorio.
2.- Razón empleo-población	Proporción de población del territorio en edad de trabajar que tiene empleo. Ofrece información sobre la capacidad de una economía para crear empleo. Reviste particular interés el desglose según sexo, edad y nivel
3.- Situación en el Empleo	Establece una distinción entre las dos categorías principales de personas ocupadas: trabajadores asalariados y trabajadores independientes. Se refiere al empleo de una persona en un momento determinado, con respecto al tipo de contrato de empleo que tiene con terceros u organizaciones.
4.- Empleo por sector	Los sectores de actividad económica se definen conforme a la Clasificación Industrial Internacional Uniforme de todas las Actividades Económicas (CIIU), Revisión 2 (1968), Revisión 3 (1990) y Revisión 4
5.- Empleo por ocupación	Analizar las diferencias en la distribución de las ganancias y los ingresos en el tiempo y entre grupos, así como los desequilibrios entre oferta y demanda de empleo en los diferentes mercados laborales.
6.- Trabajadores a tiempo parcial	Se centra en las personas cuyo total de horas de trabajo es inferior al "tiempo completo", como proporción del empleo total. Se calculan dos medidas: total de empleo a tiempo parcial, como proporción del empleo total, o "tasa de empleo a tiempo parcial"; y porcentaje de población ocupada femenina que trabaja a tiempo parcial.
7.- Horas de trabajo	Repercuten en la salud y el bienestar de los trabajadores, el nivel de productividad y los costos laborales. Se suelen utilizar dos medidas. La primera guarda relación con las horas semanales que trabaja un asalariado utilizando los siguientes tramos: menos de 15 horas trabajadas por semana; entre 15 y 29 horas; entre 30 y 34 horas; entre 35 y 39 horas; entre 40 y 48 horas; y 49 horas y más. Cuando es posible, los datos se desglosan por sexo, grupo de edad y situación en el empleo (total y
8.- Empleo en la economía informal	Desempeña un papel fundamental en la creación de empleo, ingresos y producción en muchos territorios. Se caracteriza por condiciones de trabajo deficientes; ausencia de protección social; mayor incidencia de accidentes y enfermedades laborales; etc.
9.- Desocupación	Junto con la tasa de participación de la fuerza de trabajo (KILM 1) y la razón empleo-población (KILM 2), proporciona información sobre la actividad económica y la del mercado laboral. Indica la proporción de la fuerza de trabajo que no tiene trabajo, que está disponible para trabajar, y que está en plena búsqueda de empleo.
10.- Desocupación juvenil	El indicador presenta la desocupación juvenil en cuatro formas: a) tasa de desocupación juvenil; b) índice de la tasa de desocupación juvenil con respecto a la de los adultos; c) participación de los jóvenes en la desocupación total; y d) desocupación juvenil como proporción de la
11.- Desocupación de larga duración	La desocupación tiende a tener efectos más graves cuanto más se prolonga. Puede provocar penurias sustanciales, en especial cuando no existen las prestaciones de desempleo o se han agotado. Los datos se pueden presentar desglosados por sexo y por grupo de edad (total, jóvenes y adultos). Se pueden plantear dos medidas separadas: personas que permanecen desocupadas durante un año o más, como porcentaje de la fuerza de trabajo; y personas desocupadas durante un año o más, como
12.- Subocupación por insuficiencia de horas	Refleja la infrautilización de la capacidad productiva de la fuerza de trabajo. Incluye a todas aquellas personas ocupadas que, "durante el período de referencia corto, deseaban trabajar más horas, habían trabajado un número de horas inferior al valor umbral especificado a nivel nacional, y estaban disponibles para trabajar más horas durante un período posterior
13.- Personas	Porcentaje de la población que no trabaja ni busca trabajo. La tasa

fuera de la fuerza de	inactividad femenina es un buen indicador. Al sumar la tasa de inactividad a la tasa de participación de la fuerza de trabajo, el total será del 100 por
14.- Nivel de estudios y alfabetización	La información sobre el nivel de estudios es el mejor indicador del nivel de cualificación de la fuerza de trabajo. Se suelen presentar las tasas de desocupación de las personas con estudios completos, para el nivel equivalente o inferior al de enseñanza primaria, enseñanza secundaria o nivel superior, respectivamente.
15.- Salarios y costes laborales	Los salarios constituyen un indicador del nivel y de la tendencia del poder adquisitivo de los trabajadores, y una aproximación de su nivel de vida. Los costos laborales proporcionan una estimación del gasto de los empleadores en el empleo de su fuerza de trabajo. Los indicadores son complementarios. La información sobre los salarios promedio es relevante. Es esencial para evaluar el nivel de vida y las condiciones de empleo y de
16.- Productividad laboral	Rendimiento del trabajo de las personas ocupadas. Es un indicador fundamental del rendimiento económico. La productividad laboral se define como la producción por unidad de mano de obra. Se destacan dos indicadores: PIB por persona participante, y PIB por hora trabajada.
17.- Pobreza; distribución de los ingresos; empleo por nivel económico; y trabajadores	La pobreza laboral puede producirse cuando, con el propio trabajo, se es incapaz de generar ingresos suficientes para mantener un nivel mínimo de vida. La forma más efectiva de mejorar el nivel de bienestar es aumentar las posibilidades de empleo y la productividad laboral mediante la educación y la formación. La estimación de la cantidad de personas pobres de un territorio depende del umbral de pobreza de referencia. Las diferencias entre definiciones dificultan las comparaciones.

Fuente: OIT (2015). 9ª edición de los KILM.

Los KILM mantienen importantes vínculos con la Agenda 2030 para el Desarrollo Sostenible. Permiten mejorar la producción y difusión de estadísticas a todos los niveles, para poder comprender mejor los acontecimientos a nivel nacional, regional y mundial, y que la formulación de las políticas éste mejor fundamentada. De manera específica, el crecimiento económico inclusivo y sostenible, y el empleo pleno y productivo y el trabajo decente, constituyen la finalidad general del Objetivo 8 de la Agenda de Desarrollo Sostenible. En ese sentido, los KILM sirven como fuente de datos para medir la evolución hacia la consecución del octavo Objetivo de Desarrollo Sostenible (ODS 8), de “promover el crecimiento económico sostenido, inclusivo y sostenible, el empleo pleno y productivo y el trabajo decente para todos”. Asimismo, los KILM también proporcionan valiosa información sobre indicadores de otros ODS vinculados al empleo y al mercado de trabajo. Así, se puede afirmar que el programa KILM ha favorecido presentar un conjunto básico de indicadores del mercado de trabajo y mejorar la disponibilidad de los indicadores para controlar las nuevas tendencias en materia de empleo.

Las diferentes dimensiones de calidad del empleo están asociadas a conjuntos de indicadores que sirven para medirla. Como señalan Arranz y otros (2016), algunas de las principales instituciones internacionales han elaborado paneles de índices de calidad del empleo que presentan distintos enfoques y estructuras muy diferenciadas. El diseño de un panel de indicadores a escala regional, que sirva para medir la calidad del empleo desde una perspectiva sectorial, invita a realizar una revisión de algunos de los más relevantes.

El Índice Europeo de Calidad del Trabajo (JQI o European Job Quality Index) del Instituto de Sindicatos Europeos (European Trade Union Institute (ETUI) plantea una medida multidimensional de la calidad de los puestos de trabajo que permite evaluar seis dimensiones: salarios, formas de empleo y seguridad laboral, tiempo

de trabajo y equilibrio trabajo-vida, condiciones laborales, habilidades y desarrollo profesional y, finalmente, la representación de los intereses colectivos. Cada una de esas dimensiones se compone de dos a cuatro indicadores, cuyo número total es de 16 (Leschke et al., 2008).

El sistema se centra en la calidad del empleo desde la perspectiva de los trabajadores, por lo que casi todas las variables se miden desde el plano individual. Sus indicadores son extraídos de la *Encuesta Europea sobre las Condiciones de Trabajo* (EWCS) realizada por Eurofond, la *Encuesta de Población Activa de la UE* (LFS) de Eurostat, la *Encuesta Europea de Condiciones de Vida* (EU-SILC), la *Base de Datos Macroeconómica Anual* (AMECO) y la *Base de Datos sobre las Características Institucionales de los Sindicatos, la Fijación de Salarios, la Intervención Estatal y los Pactos Sociales* (ICTWSS). Este Índice es uno de los que cubre un rango más amplio de áreas de la calidad del trabajo identificadas por la literatura especializada, aunque omite otras, como la utilización de las competencias en el trabajo, los sentimientos subjetivos de realización o autoestima, los aspectos relacionados con el entorno social y la exposición a riesgos psicosociales.

Por otra parte, los *Indicadores Laeken de Calidad del Empleo* de la Comisión Europea tienen como objetivo evaluar su evolución a lo largo del tiempo en los distintos países miembros (Comisión Europea, 2001), y mejorar la eficacia y eficiencia de las políticas públicas dentro del espacio europeo integrado. Concibe una definición de calidad del empleo que pretende recoger su carácter multidimensional, haciendo referencia a un conjunto de diez dimensiones agrupadas en dos amplias categorías, denominadas “*Características del trabajo en sí mismo*” y “*El trabajo y contexto laboral*”. Ha definido varios indicadores para cada una de esas diez dimensiones: calidad intrínseca del puesto de trabajo; cualificación permanente y desarrollo profesional; igualdad de género; seguridad y salud en el trabajo; flexibilidad y seguridad laboral; inclusión y acceso al mercado de trabajo; organización del trabajo y equilibrio trabajo-vida cotidiana; diversidad y no discriminación; productividad del trabajo y resultado económico general; así como diálogo social y participación de los trabajadores, en la que no se ha llegado a ningún acuerdo. La medición de esos indicadores utiliza las principales bases de datos europeas, tales como el Panel de Hogares de la Unión Europea, la Encuesta de Población Activa de la Unión Europea y algunas variables de Eurostat.

El panel presenta algunas limitaciones e inconsistencias que se reflejan en algunos de los resultados obtenidos. Así, no incluye un sistema de ponderación entre las distintas dimensiones; algunos no miden directamente aspectos relacionados con la calidad del trabajo sino otros como la cantidad de empleos o las transiciones entre las situaciones de ocupación, paro e inactividad; se detecta la falta de indicadores sobre aspectos cualitativos relativos a la formación para la cualificación o la intensidad del trabajo; y, lo que es muy importante, no se incorporan los salarios. En el año 2008, el informe *Employment in Europe 2008* (Comisión Europea, 2008), propuso alternativas para resolver algunos de esos problemas, planteando la propuesta de incorporar doce nuevas variables, la reformulación de otras ya incluidas y la creación de un indicador agregado para clasificar a los países en base a un índice (Muñoz de Bustillo, et al., 2009). A pesar de ello, durante varios años, dichos informes han dejado de publicar el capítulo dedicado a la calidad del empleo utilizando estos indicadores.

También, la *Encuesta Europea sobre las Condiciones de Trabajo* (EWCS) de la Fundación Europea para la Mejora de las Condiciones de Vida y de Trabajo (Eurofound) propone un sistema de indicadores de calidad del empleo cuya finalidad consiste en mostrar la situación laboral de la población por países, ocupaciones, sectores y grupos de edad (Eurofound, 2012). El panel contempla cuatro dimensiones: ingresos, perspectivas de estabilidad y progresión profesional, calidad intrínseca del puesto de trabajo, así como calidad del tiempo de trabajo. Bajo su enfoque, como señalan Arranz, et al. (2016), el término “calidad del empleo” se utiliza como sinónimo de “calidad del trabajo y la ocupación” y abarca la naturaleza del lugar físico del trabajo, pero no cubre la naturaleza del mercado de trabajo, la protección social o la economía en general.

Además, el *Índice de calidad de vida* (*How's Life Index* de la Organización para la Cooperación y el Desarrollo Económicos (OCDE) evalúa la calidad de vida de las personas y no sólo el nivel total o promedio de riqueza de las economías. La OCDE, a través de iniciativas como la *Comisión Stiglitz, Sen y Fitoussi* (Stiglitz et al., 2009) y la *Iniciativa para una Vida Mejor* (OCDE, 2014), ha identificado tres dimensiones complementarias esenciales para la medición de la calidad del trabajo, a través de un conjunto de indicadores, en países y grupos de trabajadores, manteniendo una base común que permite realizar comparaciones. Esas dimensiones son: ingresos, seguridad en el mercado laboral y calidad del entorno laboral. Se fundamentan en la idea de que la calidad del empleo se refiere a los aspectos de la ocupación que contribuyen al bienestar individual de los trabajadores y el adecuado desempeño económico. Se articulan a través de un número limitado de indicadores que son fácilmente medibles, posibilitan realizar comparaciones entre países y grupos sociodemográficos a lo largo del tiempo y pueden ser relevantes a la hora de tomar decisiones políticas.

La propuesta tiene en cuenta el nivel de ingresos, las tasas de empleo y desempleo, la seguridad y estabilidad en el empleo, y otros indicadores relacionados con la calidad del entorno laboral, incluyendo factores relacionados con la naturaleza y el contenido del trabajo que se realiza, la distribución del tiempo de trabajo y las relaciones en el lugar de trabajo. El enfoque de la OCDE se centra más en los resultados, los trabajadores y los aspectos objetivos de la calidad del empleo, con la finalidad de obtener una mayor precisión y evitar interpretaciones subjetivas.

De manera adicional, desde una perspectiva integradora, la OIT (1999) planteó en su concepto de “trabajo decente” con el objetivo de que condujera a nuevas mediciones basadas en una recopilación de datos más exacta y comparable internacionalmente. Según esa visión, un empleo decente implica condiciones de trabajo adecuadas y justas para los trabajadores, no siendo suficiente tener trabajo sino que este tiene que ser de calidad. El trabajo decente sintetiza las aspiraciones de las personas durante su vida laboral. Significa la oportunidad de acceder a un empleo productivo que genere un ingreso justo, la seguridad en el lugar de trabajo y la protección social para las familias, mejores perspectivas de desarrollo personal e integración social, libertad para que los individuos expresen sus opiniones, se organicen y participen en las decisiones que afectan sus vidas, y la igualdad de oportunidades y trato para todos, mujeres y hombres.

El primer intento de sintetizar indicadores de empleo decente fue realizado por la Oficina Regional de la OIT en América Latina y el Caribe (OIT, 2001). Recogía

información sobre la evolución de la situación laboral de 15 países y estaba compuesto por siete indicadores: desempleo, informalidad, salario industrial, salario mínimo, brecha salarial entre hombres y mujeres, cobertura de la seguridad social y horas trabajadas. En 2002 incorporó cuatro nuevas dimensiones: cumplimiento de la normativa laboral, calidad del trabajo, protección social y diálogo social (OIT, 2002).

Un año más tarde la Revista Internacional del Trabajo de la OIT, dedicó una edición especial a la medición del trabajo decente. En la misma, Anker et al. (2003) plantean una amplia selección de indicadores, reconociendo que la medición del trabajo decente está muy limitada por la disponibilidad de datos comparables a nivel internacional sobre las condiciones de empleo. También, Bescond et al. (2003) proponen una metodología diferenciada recurriendo a siete indicadores de trabajo decente. Más adelante, Ghai (2006), destacando que el empleo decente tiene las mismas características en todas las economías y que lo que cambia es la importancia que se le atribuye a cada componente, formuló una serie de indicadores: oportunidades de empleo (disponibilidad de empleo y trabajo elegido libremente); trabajo productivo y remunerado; y condiciones de trabajo (trato justo en materia de empleo, armonización del trabajo con la vida privada, estabilidad y seguridad del empleo, y salud y seguridad en el trabajo).

En 2008, la Organización Internacional de Empleadores (OIE) declaró que el trabajo decente no establecía parámetros claros ni consideraba las condiciones particulares de cada mercado laboral (IOE, 2008). Paralelamente, muchos analistas del mercado laboral se opusieron a la idea de que el trabajo decente pudiese ser resumido en un indicador compuesto. Mientras que algunos expertos estaban convencidos de la necesidad de diseñar un indicador comparativo que permitiese medir el trabajo decente, otros argumentaban que el concepto era demasiado complejo para realizar un enfoque tan simplista y que cualquier metodología estandarizada pasaría por alto los detalles de mercados laborales muy heterogéneos (Burchell y otros, 2014).

En septiembre de 2008, como respuesta a esas dificultades conceptuales, la OIT convocó una Reunión internacional tripartita de expertos (TME) que adoptó un marco de indicadores de trabajo decente, estadístico y legal, aprobado por la 18ª Conferencia Internacional de Estadísticos del Trabajo. En el mismo se esbozaba un enfoque integral de la medición del trabajo decente a través de un nuevo conjunto de 19 indicadores básicos, 25 indicadores adicionales y otras 8 variables relacionadas con el contexto socioeconómico de los países miembros (OIT, 2008). En la reunión se acordó satisfacer la necesidad de establecer una metodología para la medición del Trabajo Decente en base a indicadores de cantidad y calidad, mejorando el seguimiento de los datos. En 2009, se lanzó el nuevo Departamento de Estadísticas de la OIT con la intención de perfeccionar la recopilación de datos y obtener información para cada país.

El carácter multifacético del Programa de Trabajo Decente de la OIT combina el acceso al empleo pleno y productivo con los derechos en el trabajo, la protección social y la promoción del diálogo social. Durante los últimos años, la Organización Mundial del Turismo (OMT) ha colaborado con la Organización Internacional del Trabajo (OIT), mediante el desarrollo de un acuerdo sobre empleo y trabajo decente en el sector turístico. Esa labor se desarrolla conjuntamente entre el

Departamento de Estadística de la OIT y el Programa de Estadísticas y Cuenta Satélite de Turismo de la OMT.

Uno de los objetivos principales del acuerdo se centra en mejorar los métodos nacionales de recopilación de datos de empleo en las industrias turísticas, desarrollando descripciones metodológicas de series estadísticas sobre empleo, recogiendo la información de diferentes fuentes, así como recopilando algunos de los métodos utilizados por los países para computar dichas variables. Además, selecciona ejemplos de buenas prácticas de medición del empleo en la actividad turística de países que han demostrado su capacidad de elaborar un conjunto completo de indicadores de empleo. También, se intenta comprobar la aplicación práctica en diferentes países seleccionados como casos de estudio para comprender en mayor profundidad qué indicadores, del conjunto de indicadores de trabajo decente de la OIT, podrían utilizarse en el contexto del turismo.

La OIT ha elaborado un programa que se basa en la creación de empleo, los derechos en el trabajo, la protección social y el diálogo social, con la igualdad de género como un objetivo transversal. A raíz de la crisis mundial de 2008 es apremiante proporcionar empleos de calidad asociados a la protección social y al respeto de los derechos en el trabajo, a fin de alcanzar un crecimiento económico sostenible e inclusivo y erradicar la pobreza. El reciente informe “*Working conditions in a global perspective*” (2019), elaborado conjuntamente por la OIT y Eurofound sobre la situación laboral en 41 países que aglutinan a 1.200 millones de trabajadores del mundo, refleja la existencia de importantes diferencias en las condiciones de trabajo. En el mismo se analizan siete aspectos de la calidad de los puestos de trabajo: el entorno físico, la intensidad del trabajo, la calidad del tiempo de trabajo, el entorno social, las competencias y el desarrollo, las perspectivas y la remuneración.

6. LOS INDICADORES DE LOS OBJETIVOS DE DESARROLLO SOSTENIBLE

La revisión de los indicadores relacionados con el empleo de varias metodologías desarrolladas internacionalmente para medir la sostenibilidad, muestra que las variables cuantitativas son predominantes en este campo (ver Tabla 3). De este modo, la mayoría de indicadores para el empleo, con la excepción del utilizado por el World Economic Forum (WEF) para la elaboración de su Travel and Tourism Competitive Index, no incluyen entrevistas o encuestas con los agentes involucrados en el desarrollo del sector turístico.

Tabla 3. Indicadores relacionados con el empleo, utilizados por diferentes metodologías

Metodología	Indicadores
OMT (2004)	Número de personas locales (hombres y mujeres) empleadas en el turismo
ETIS (2016)	Empleo directo en el sector turístico como % del total del empleo en el destino
	% de hombres y mujeres trabajando en el sector turístico
	% Empleo estacional
World Economic Forum (2017)	Facilidad para encontrar empleados locales en el sector turístico
Instituto Nacional de Estadística (INE)	% de desempleo en el sector turístico
	% de empleados con educación superior que trabajan en el sector turístico

Fuente: elaboración propia a partir de los indicadores de OMT (2004), European Union (2016), INE, World Economic Forum (2017)

Por su parte, en lo relativo a los indicadores que las Naciones Unidas han desarrollado para medir el grado de cumplimiento de los Objetivos de Desarrollo Sostenible (ODS), el empleo ha sido considerado como una de las variables esenciales. El trabajo decente y los cuatro pilares del Programa (creación de empleo, protección social, derechos en el trabajo y diálogo social) se han convertido en un objetivo universal y han sido integrados en las más importantes declaraciones de derechos humanos, las Resoluciones de la ONU y los documentos finales de las principales conferencias, incluyendo el Artículo 23 de la Declaración Universal de los Derechos Humanos (1948), la Cumbre Mundial sobre Desarrollo Social (1995), el Documento de la Cumbre mundial (2005), el segmento de alto nivel de ECOSOC (2006), la Segunda década de las Naciones Unidas para la erradicación de la pobreza (2008-2017), la Conferencia sobre el Desarrollo Sostenible (2011) y la Agenda 2030 para desarrollo sostenible de las Naciones Unidas (2015). Asimismo, otros aspectos esenciales del trabajo decente están totalmente contemplados en las metas de muchos de los otros 16 objetivos de la nueva visión de desarrollo de las Naciones Unidas.

La Tabla 4 muestra los indicadores de los ODS que tienen relación directa con el empleo, los cuales se encuadran fundamentalmente dentro del objetivo 8 (Promover el crecimiento económico sostenido, inclusivo y sostenible, el empleo pleno y productivo y el trabajo decente para todos). También, dentro del Objetivo 9 (Construir infraestructuras resilientes, promover la industrialización inclusiva y sostenible y fomentar la innovación), se recoge el indicador: 9.2.2 (Empleo del sector manufacturero con respecto al total).

Tabla 4. Indicadores de los ODS relacionados con el empleo

Objetivo 8. Promover el crecimiento económico sostenido, inclusivo y sostenible, el empleo pleno y productivo y el trabajo decente para todos
8.3.1 Proporción de empleo informal en el sector no agrícola, desglosado por sexo
8.5.1 Ingreso medio por hora de empleadas y empleados, desglosado por ocupación, edad y personas con discapacidad
8.5.2 Tasa de desempleo, desglosada por sexo, edad y personas con discapacidad
8.6.1 Proporción de jóvenes (entre 15 y 24 años) que no cursan estudios, no están empleados ni reciben capacitación
8.7.1 Proporción y número de niños de entre 5 y 17 años que realizan trabajo infantil, desglosados por sexo y edad
8.8.1 Tasas de frecuencia de las lesiones ocupacionales mortales y no mortales, desglosadas por sexo y estatus migratorio
8.8.2 Nivel de cumplimiento nacional de los derechos laborales (libertad de asociación y negociación colectiva) con arreglo a las fuentes textuales de la Organización Internacional del Trabajo (OIT) y la legislación interna, desglosado por sexo y estatus migratorio
8.9.2 Proporción de empleos en el sector del turismo sostenible respecto del total de empleos del turismo
8.b.1 Existencia de una estrategia nacional organizada y en marcha para el empleo de los jóvenes, como estrategia independiente o como parte de una estrategia nacional de empleo

Fuente: Elaboración propia a partir de United Nations (2015)

A pesar de que estos indicadores abordan aspectos hasta ahora no desarrollados por las anteriores metodologías, adolecen de algunos de los problemas que se han mencionado anteriormente. En primer lugar, están definidos en su mayoría para una escala nacional, lo cual teniendo en cuenta la naturaleza de las actividades turísticas y la importancia de la variante territorial, puede carecer de sentido. En segundo lugar, el método de cálculo es puramente cuantitativo, sin que se propongan entrevistas y/o encuestas para obtener los datos. Para el caso de la relación del empleo y el turismo, el indicador propuesto (8.9.2: Proporción de empleos en el sector del turismo sostenible respecto del total de empleos del turismo) presenta el grave inconveniente de necesitar una definición, la de turismo sostenible sobre la que todavía existen diferentes interpretaciones que son objeto de diálogo, conflicto y negociaciones entre los agentes implicados (Bramwell y otros, 2017).

Entre los aspectos novedosos de los indicadores, que inciden en una medición más cualitativa del empleo, están las relacionadas con la seguridad laboral (lesiones ocupacionales) y las condiciones de trabajo (ingreso medio por hora). Sin embargo, los indicadores que se proponen están relacionados en su mayoría con una sola vertiente de la sostenibilidad, la social, y dejan de lado los otros dos miembros del “triumvirato”. Es por lo tanto necesario tener en cuenta que el empleo en el sector turístico no tiene influencia solamente en las vertientes sociales y económicas, sino que es necesario evaluar, aunque sea de manera aproximada en las fases iniciales, cual es el impacto que tiene desde el punto de vista medioambiental. Otro de los requisitos para construir un sistema de indicadores que ofrezca una imagen más completa del empleo turístico son los aspectos relacionados con la calidad y con la satisfacción de las personas empleadas.

7. PROPUESTA DE DIMENSIONES E INDICADORES PARA LA MEDICIÓN DEL EMPLEO TURÍSTICO REGIONAL

Las principales dimensiones recogidas en el índice de empleo decente de la OIT (2017b) son: ingresos adecuados y trabajo productivo; tiempo de trabajo decente; conciliación de la vida laboral, familiar y personal; trabajo que debería abolirse; estabilidad y seguridad en el trabajo; igualdad de oportunidades y trato en el empleo; entorno de trabajo seguro; seguridad social; diálogo social; y oportunidades de empleo.

Después de realizar una revisión de los paneles de indicadores propuestos por algunos de los principales Organismos Internacionales, especializados en la medición de la calidad del empleo, se proponen un conjunto de dimensiones e indicadores (ver Tabla 5) que están en consonancia con los enfoques de la Organización Mundial del Turismo (OMT), la Organización Internacional del Trabajo (OIT) y la Agenda 2030 de Desarrollo sostenible. Lógicamente, su desarrollo conllevará hacer una adecuada selección y filtrado de los indicadores asociados a cada una de esas dimensiones, máxime teniendo en cuenta que su aplicación a contextos geográficos regionales conlleva garantizar el acceso a fuentes de información que sean fiables y comparables.

Se destaca que se han incluido una gran parte de las dimensiones directamente relacionadas con los planteamientos del trabajo decente, complementadas con otras consideradas muy relevantes, como “Información, conocimiento, aprendizaje organizativo y adaptación tecnológica”, que no aparecen recogidas en los sistemas analizados en una época en que las nuevas tecnologías y las nuevas formas de organización del trabajo están remodelando el mercado laboral.

Asimismo, se incorporan los Indicadores Clave del Mercado de Trabajo (KILM, 2015) porque, con las correspondientes adaptaciones, sirven para medir la situación del empleo en cualquier sector de actividad. Su implementación, a través de indicadores, requiere hacer un filtrado de aquellos que son perfectamente aplicables a ámbitos geográficos regionales por disponer de fuentes de datos y ser comparables. También, se hace especial énfasis en la necesidad de establecer un sistema de ponderaciones que adecuen la información obtenida del análisis de los indicadores a la realidad del sector turístico. Así, por ejemplo, aquellos referidos a la temporalidad del empleo o el trabajo a tiempo parcial en la empresa turística, que pueden tener un notable efecto sobre la productividad y la redistribución de la renta en el territorio, han de ser especialmente valorados.

Tabla 5. Dimensiones propuestas para medir la sostenibilidad del empleo turístico

Ingresos adecuados	Salario/hora; Salario medio mensual del sector turismo en relación al salario medio de otros sectores de actividad ajustado por la paridad de poder adquisitivo; Desigualdad de ingresos anuales brutos de empleados de turismo a tiempo completo; Retribución no monetaria
Trabajo productivo y resultado económico general	Crecimiento de la productividad laboral (por hora trabajada); Crecimiento de la productividad laboral (por persona empleada); Producción total (por hora trabajada y por persona empleada); KILM
Condiciones de trabajo dignas y decentes	Duración semanal de la jornada laboral; Horario de trabajo; Discrecionalidad sobre cambios en el horario; Flexibilidad sobre el tiempo de trabajo; Tipo de jornada (continua/partida); Tipo de turno (fijo/flexible); Horas extras; Factores físicos y psicológicos del trabajo; Tensión laboral; Nivel de cualificación y tipo de contrato; Valoración de las condiciones de trabajo en el puesto actual con respecto a las estrictamente legales
Calidad intrínseca del empleo	Ver Tabla 6.
Conciliación de la vida laboral, familiar y personal	Proporción de trabajadores que trabajan más de 48 horas a la semana; Promedio de la proporción de trabajadores que trabajan en turnos; Horas de trabajo ajustadas a la conciliación; Protección de maternidad y paternidad; Conciliación de trabajo y estudios; Equilibrio trabajo-vida cotidiana;
Salud y entorno de trabajo seguro	Nivel de riesgo de peligros; Riesgos posturales; Tasa de accidentalidad laboral; Ausencia de abuso y violencia física y psicológica; Planes de seguridad en el trabajo.
Estabilidad y seguridad en el trabajo	Tiempo ligado a la empresa en número de meses; Tipo de contrato (indefinido/temporal); Dedicación (tiempo completo/tiempo parcial); Cambio de trabajo en los últimos 12 meses; Empleo fijo sobre el total de empleados; Empleo temporal sobre el total de empleados; Empleo a tiempo parcial sobre el total de empleados; Riesgo de pérdida del
Igualdad de oportunidades y trato en el empleo	Relación entre ingresos brutos/hora de hombres y mujeres; Diferencias en la tasa de empleo entre hombres y mujeres;

	en la tasa de empleo para trabajadores de 55-65 años; Diferencias en la tasa de empleo para minorías étnicas e inmigrantes; Segregación de género en el
Formación permanente en el empleo, mejora continua y desarrollo profesional	Tasa de empleo por nivel educativo; Nivel educativo del empleado; Proporción de trabajadores que participan en educación o formación durante el último año; Relación Nivel de Cualificación con ocupación; Perspectivas de progreso profesional en el trabajo; Formación específica y transversal en el puesto de trabajo; Oportunidades reales de promoción y desarrollo del talento dentro de la empresa; Conocimiento de idiomas;
Diálogo social	Cobertura de la negociación colectiva; Densidad sindical; Representación de los empleados en la empresa; Nivel de conflicto laboral.
Información, conocimiento, aprendizaje organizativo y adaptación tecnológica	Flujos de información en el puesto de trabajo; Compartición de conocimiento en el empleo; Aprovechamiento del potencial de capacidades de los empleados; Nivel de cambio tecnológico; Nivel de adaptación de los trabajadores al cambio
Situación del mercado laboral de la región en general y del sector turístico en particular (KILM)	KILM 1 a KILM 17.

Fuente: Elaboración propia

Adicionalmente, las buenas condiciones de trabajo y la calidad intrínseca del empleo contribuyen al bienestar de los trabajadores y al éxito de las empresas. La comprensión de los factores que afectan al bienestar y a la productividad de los empleados es un paso decisivo para la consecución de trabajo decente. Por ello, se plantean indicadores dirigidos a medir la dimensión relativa a la calidad intrínseca del empleo, debido a sus efectos directos sobre la productividad de las organizaciones turísticas. En este caso, la información se obtendría a partir de datos extraídos de encuestas dirigidas a los diferentes colectivos de trabajadores que desempeñan su actividad en las empresas del sector.

Tabla 6. Indicadores propuestos para medir la dimensión de calidad intrínseca del empleo

Dimensión	Indicadores		
	Responsabilidad	Interdependencia	Rotación
	Autoridad	Interacción	Motivación
	Autonomía laboral	Coordinación	Recompensas intrínsecas
	Significado de la Tarea	Formalización	Experiencia
	Identidad de la Tarea	Evaluación del	Dotación de recursos al

Calidad intrínseca del empleo		desempeño	puesto de trabajo
	Complejidad de las tareas	Compensación	Desplazamientos dentro y fuera de la empresa
	Intensidad del trabajo	Calidad del entorno laboral	Resolución de problemas
	Variedad de habilidades	Equipos y tecnología	Calidad del contrato
	Especialización	Implicación	Comportamiento ético
	Relaciones sociales	Ambiente de trabajo	Enriquecimiento del puesto
	Trabajo en equipo	Orientación Back - Front del empleo	Satisfacción laboral en el puesto actual

Fuente: Elaboración propia

Finalmente, se propone una batería de 10 indicadores (Tabla 7) para medir la sostenibilidad del empleo turístico, que contempla las dimensiones económica, social y medioambiental.

Tabla 7. Indicadores propuestos para medir la sostenibilidad del empleo turístico

Dimensión	Indicadores	Fuente de información	Escala a la que se puede medir
Económica	% de empleo turístico sobre el total - dividido por sexo	Adaptado de ETIS (2016)	Municipal
	Ingreso medio comparado con otros sectores	Adaptado de United Nations (2015)	Regional
	% de Bajas laborales en el sector turístico sobre el total	Elaboración propia	Municipal
	Absentismo laboral en relación con el resto de sectores	Elaboración propia	Regional
Social	Facilidad para encontrar empleados locales en el sector turístico	World Economic Forum	Regional, Municipal
	Satisfacción de los empleados/as del sector turístico	Elaboración propia	Municipal
	Número de días de	Elaboración propia	Municipal

	huelga en el sector turístico		
Medioambiental	Distancia de desplazamiento entre lugar de residencia y trabajo	Elaboración propia	Regional, Municipal
	Medio de transporte usado para llegar al lugar de trabajo	Elaboración propia	Regional, Municipal
	Número de horas de formación en aspectos ambientales	Elaboración propia	Municipal

Fuente: Elaboración propia

8. CONCLUSIONES

La crisis ha acentuado que el patrón de crecimiento de las diferentes regiones de Europa presente una creciente heterogeneidad. Algunas economías del Sur, Este y la Ultraperifería están generando importantes desequilibrios macroeconómicos que cuestionan la sostenibilidad del proceso de desarrollo. A nivel de especialización territorial, presentan una orientación hacia actividades de menor productividad, como la construcción y el turismo, respecto a las regiones del Centro y Norte, que se distinguen por una orientación más industrial y de servicios intensivos en conocimiento.

Las políticas públicas han de favorecer el rendimiento del mercado laboral y perseguir asegurar el mantenimiento de sus niveles de calidad. El empleo productivo y el trabajo decente son factores esenciales para generar ventajas competitivas empresariales sostenibles en el tiempo y redistribuir territorialmente la riqueza. La creación y el mantenimiento del empleo turístico depende, en gran medida, de su calidad y capacidad para generar puestos de trabajo con empleados cualificados, autónomos, comprometidos y satisfechos, que innoven y potencien la creación de valor añadido en la empresa.

El turismo es el motor de la economía en Canarias y todo parece indicar que lo seguirá siendo en el futuro. Una actividad que genera tantos ingresos y tiene tanto peso en el PIB y el empleo del Archipiélago debería ser capaz de traducirse en prosperidad y bienestar para la población residente. Sin embargo, la realidad muestra que, a pesar de ser una potencia turística mundial, el territorio insular posee uno de los mercados laborales más degradados de Europa. Manifiesta grandes desigualdades interregionales e intrarregionales en renta per cápita, productividad por trabajador, competitividad territorial y, lo que es extremadamente importante, en materia de empleo.

La medición de la calidad del empleo turístico permitiría conocer sus efectos como fuente de ventaja competitiva empresarial y redistribución territorial de la riqueza, así como su contribución al desarrollo endógeno regional. Paradójicamente, no abundan los estudios orientados a tal fin. En este trabajo se realiza una revisión de los planteamientos que los académicos y algunas de las principales instituciones

internacionales están realizando en materia de medición de la calidad del empleo. La finalidad consiste en confeccionar un panel de dimensiones e indicadores que sea aplicable a las industrias turísticas regionales en las que una elevada intensidad de servicios de bajo valor añadido convive con una alta incidencia del desempleo y puestos de trabajo de baja calidad.

Se ha definido y construido un panel de dimensiones de calidad del empleo que, teniendo en cuenta las particularidades específicas de la actividad turística, permita obtener información fiable sobre el mercado de trabajo y pueda ser potencialmente extrapolable a otros sectores de actividad y ámbitos regionales. También, se han seleccionado algunos indicadores que pueden ser relevantes para efectuar la medición. El planteamiento propuesto incorpora una perspectiva multidimensional de la calidad del empleo; está basado en criterios de sostenibilidad vinculada a los ámbitos territoriales regionales; complementa a los desarrollos ya existentes, recogiendo e integrando las propuestas de algunas de las instituciones de referencia mundial en el ámbito laboral; y es técnicamente viable para su aplicación en contextos regionales.

La metodología conlleva una selección de dimensiones con sus correspondientes indicadores que puedan mantenerse en el tiempo y actualizarse periódicamente. Además, ha de posibilitar la comparación entre colectivos de trabajadores, regiones, y entre éstas con ámbitos geográficos superiores. Asimismo, debe favorecer la realización de estudios transversales y longitudinales, orientados a observar la evolución temporal de la calidad del empleo, así como tener en cuenta las fuentes de datos que se pueden utilizar.

A lo anterior se añade que un índice de calidad del empleo de carácter regional y sectorial, implicará escoger dimensiones e indicadores que busquen la sencillez e incorporen un componente ético. Asimismo, ha de recoger las visiones de la Organización Internacional del Trabajo (OIT), la Organización Mundial del Turismo (OMT), y la Agenda 2030 para el Desarrollo Sostenible (ODS 8, 12 y 14), que considera al turismo como un importante motor del crecimiento económico inclusivo y la creación de empleo decente. En definitiva, se trata de identificar cuáles son los auténticos beneficios del turismo sobre los ámbitos regionales que conviven con elevadas tasas de desempleo, como es el caso las islas Canarias.

REFERENCES

- ALONSO, O.; CHAMORRO, J. M.; GONZÁLEZ, X. (2004): Agglomeration economies in manufacturing industries: the case of Spain. *Applied Economics*, 36 (8), 103-16.
- ANKER, R.; CHERNYSHEV, I.; EGGER, P.; MEHRAN, F. (2003): Measuring Decent Work with statistical indicators. *International Labour Review*, 142, (2), 147.
- AROCENA, J. (2001): *El desarrollo local: un desafío contemporáneo*. Montevideo, Universidad Católica y Ediciones Santillana.
- ARRANZ, J.M; GARCÍA, C.; HERNANZ, V. (2016): *Índice de calidad del empleo*. Aempleo. Madrid.
- ASHLEY, C., DE BRINE, P., LEHR, A.; WILDE, H (2007): *The role of the tourism sector in expanding economic opportunity*. Corporate Social Responsibility Initiative Report. Kennedy School of Government. Harvard University, Cambridge.
- BELLANDI, M. (1996): Algunas consideraciones acerca de la creación de economías de escala y la dinámica técnico-organizativa de los procesos productivos. *ICE. Revista de*

Economía, 754, 73-83.

BESCOND, D.; CHATAIGNIER, A.; MEHRAN, F. (2003): Seven indicators to measure Decent Work. *International Labour Review*, 142 (2), 179-211.

BOISIER, S. (1993): Desarrollo regional endógeno en Chile. ¿Utopía o necesidad?. *Ambiente y Desarrollo*, IX (2), CIPMA, Santiago de Chile.

BOISIER, S. (2000): Conversaciones sociales y desarrollo regional. Talca: Ediciones Universidad de Talca.

BRAMWELL, B.; HIGHAM, J.; LANE, B.; MILLER, G. (2017): Twenty-five years of sustainable tourism and the Journal of Sustainable Tourism: Looking back and moving forward. *Journal of Sustainable Tourism*, 25 (1), 1-9.

BURCHELL, B.; SEHNBRUCH, K.; PIASNA, A.; AGLONI, N. (2014): The quality of employment and decent work: definitions, methodologies, and ongoing debates. *Cambridge Journal of Economics*, 38, 459-477

COMISIÓN EUROPEA (2001): Consejo Europeo de Laeken. Bélgica. COMISIÓN EUROPEA (2008): Informe *Employment in Europe*. Bélgica.

CUADRADO J.R. (2001): Regional convergence in the European Union. From hypothesis to the actual trends. *Annals of Regional Science*, 35, 333-356.

DELBARI, S.A.; NG, S.I.; AZIZ, Y.A.; HO, J.A. (2016): An investigation of key competitiveness indicators and drivers of full-service airlines using Delphi and AHP techniques. *Journal of Air Transport Management*, 52, 23-34.

DI PIETRO, L. (1999): *El desarrollo local. Estado de la cuestión*, FLACSO, Buenos Aires.

DREDGE, D. (1999): Destination place planning and design. *Annals of Tourism Research*, 26 (4), 772-791.

EUROFOUND (2012): *Trends in job quality in Europe*. Dublin. EUROSTAT (2018): Oficina Europea de Estadística. Luxemburgo.

EXCELTUR (2018): *Monitur 2018: la competitividad turística ante una nueva legislatura*. Madrid.

EXCELTUR Y GOBIERNO DE CANARIAS (2018): *IMPACTUR Canarias 2017: Estudio del Impacto Económico del Turismo*. Madrid: Exceltur.

FIGUEROLA, M. (2000). *Teoría económica del turismo*. Alianza Editorial, Madrid. FUÁ, G. (1994): *Economic growth: a Discussion on Figures*. Ancona, Istao FULLANA, P.; AYUSO, S. (2002): *Turismo sostenible*. Barcelona, Rubes, España.

GAROFOLI, G. (1986): Modelos locales de desarrollo. *Estudios Territoriales*, 22, 158-168.

GAIGNÉ, C.; PIGUET, V.; SCMITT, B. (2005): Évolution récente de l'emploi industriel dans les pays territoires ruraux et urbains: une analyse structurelle-géographique sur des données françaises. *Revue d'Économie Régionale et Urbaine*, 1, 3-30.

GHAJ, D. (ed). (2006): *Decent Work; Objectives and Strategies*. Geneva, International Institute for Labour Studies.

HERNÁNDEZ MARTÍN, R. (2004): El turismo en Canarias. Impacto económico y condicionantes de la insularidad. *Papeles de Economía Española*, 102, 91-106.

INRouTe; OMT (2012). *A closer look at tourism: Sub-national measurement and analysis - towards a set of UNWTO guidelines*. Madrid: OMT.

ORGANIZACIÓN INTERNACIONAL DE EMPLEADORES (2008): Trabajo Decente. Cómo llevarlo a la práctica: el punto de vista de los empleadores, IOE. Disponible en www.ioe-emp.org

- JAFARI, J. (2001): *The Scientification of Tourism*. Smith, V. and Brent, M. (eds.), Hosts and Guests Revisited: Tourism Issues of the 21st. Century. New York/Chico; Cognizant Communication Corporation/California State University.
- JAFARI, J. (2005). The Scientification of Tourism. *Política y Sociedad*, 42 (1), 39-56
- LESCHKE, J.; WATT, A.; FINN, M. (2008): *Putting a Number on Job Quality? Constructing a European Job Quality Index*. Bruselas, ETUI-REHS aisbl.
- LEW, A.; MCKERCHER, B. (2006): Modeling tourist movements: A local destination analysis. *Annals of Tourism Research*, 33 (2), 403-423.
- LINSTONE, H. A.; TUROFF, M. (1975): *The delphi method*. Addison-Wesley Reading, MA.
- LUNA, K.; PELLICER, E.; GARCÍA-RODRÍGUEZ, S. (2017): Performance indicators for developer and homebuilder Mexican companies: A Delphi study. *Journal of Construction*, 16 (1), 133-144.
- MÉNDEZ, R. (1994): Sistemas productivos locales y política de desarrollo rural. *Estudios Regionales*, 39, 98-112.
- MENDOZA, J.; HERNÁNDEZ, R. (2017): Una propuesta metodológica para la medición de la sostenibilidad del turismo a escala local. *Cuadernos Económicos de ICE*, (93), 69-90.
- MITCHELL, G. (1996). Problems and fundamentals of sustainable development indicators. *Sustainable development*, 4 (1), 1-11.
- MUÑOZ DE BUSTILLO, R.; FERNÁNDEZ, E.; ANTÓN, J.I.; ESTEVE, F. (2011): *Measuring more than money: the social economics of job quality*. Cheltenham, Edward Elgar.
- NACIONES UNIDAS (2015): *The 2030 Agenda for Sustainable Development*. Nueva York.
- NAVARRO, E.; TEJADA, M.; ALMEIDA, F.; CABELLO, J.; CORTÉS, R.; DELGADO, J.; SOLÍS, F. (2012): Carrying capacity assessment for tourist destinations. Methodology for the creation of synthetic indicators applied in a coastal area. *Tourism Management*, 33 (6), 1337-1346. <https://doi.org/10.1016/j.tourman.2011.12.017>.
- NELSON, R. (1999): How New is New Growth Theory?. *Challenge*, 40 (5), 29-58.
- ORGANIZACIÓN COOPERACIÓN Y DESARROLLO ECONÓMICOS (2014): *How good is your job? measuring and assessing job quality*. OECD employment outlook, 79-139. Paris: OECD Publishing.
- ORGANIZACIÓN COOPERACIÓN Y DESARROLLO ECONÓMICOS (2019): Informe *Compendium of Productivity Indicator*. Publicaciones de la OCDE, París, <https://doi.org/10.1787/b2774f97-es>
- ORGANIZACIÓN INTERNACIONAL DEL TRABAJO (1999): *Report of the Director General: Decent Work*. International Labour Conference, 87th sesión. Ginebra, OIT.
- ORGANIZACIÓN INTERNACIONAL DEL TRABAJO (2001): *Índice de desarrollo del Trabajo Decente 1990–2000*. ILO, Geneva.
- ORGANIZACIÓN INTERNACIONAL DEL TRABAJO (2008): *The Measurement of Decent Work*. Report of the director general. Ginebra, OIT.
- ORGANIZACIÓN INTERNACIONAL DEL TRABAJO (2015): Novena edición de los Indicadores Clave del Mercado de Trabajo (KILM). Ginebra, OIT.
- ORGANIZACIÓN INTERNACIONAL DEL TRABAJO (2017a): *Informe Pautas de la OIT sobre trabajo decente y turismo socialmente responsable*. Ginebra, OIT.
- ORGANIZACIÓN INTERNACIONAL DEL TRABAJO (2017b): *Mejora de la base de conocimientos para respaldar la promoción del trabajo decente en las zonas rurales*, Bruselas, OIT.
- ORGANIZACIÓN INTERNACIONAL DEL TRABAJO y FUNDACIÓN EUROPEA PARA LA MEJORA DE LAS CONDICIONES DE VIDA Y DE TRABAJO (2019): Informe *Working*

conditions in a global perspective. OIT y EUROFOUND.

ORGANIZACIÓN MUNDIAL DE TURISMO (2004): *Indicators of Sustainable Development for Tourism Destinations. A Guidebook* (p. 516). Madrid: World Tourism Organization.

ORGANIZACIÓN MUNDIAL DE TURISMO (2010a): *International Recommendations for Tourism Statistics 2008*. United Nations, Department of Economic and Social Affairs, Statistical Division Staff New York, USA.

ORGANIZACIÓN MUNDIAL DE TURISMO (2010b): Tourism Satellite Account: Recommended methodological framework 2008. *Studies in Methods, Series F*, (80).

PEARCE, D.G. (2001): An integrative framework for urban tourism research. *Annals of Tourism Research*, 28 (4), 926–946.

PFEFFER, J. (1994): *Competitive Advantage Through People: Unleashing the Power of the Workforce*. Boston: Harvard Business School Press.

POLÈSE, M.; SHEARMUR, R. (2006): Growth and location of economic activity: the spatial dynamics of industries in Canada (1971-2001). *Growth and Change*, 37(3), 362-395.

PULIDO, J.I.; SANCHEZ, M. (2009): Measuring tourism sustainability: proposal for a composite index. *Tourism Economics*, 15 (2), 277-296.

RUBIERA, F. (2005): *Los servicios avanzados a las empresas. Dinámicas de localización, patrones de externalización y efectos sobre el desarrollo regional*. España: Civitas.

SCOTT, A. (1988): *New Industrial Spaces*. Londres, Pion Ltd.

SCOTT, A.; GAROFOLI, G. (2007): *Development on the Ground*. Londres y Nueva York, Routledge.

SFORZI, F. (1987): L'identificazione spaziale. *Becattini, G. (coord.)*, 143-167.

SFORZI, F. (1999): La variable territorio en el análisis económico. Valencia, Universidad Internacional Menéndez Pelayo (mimeo).

SHARPLEY, D.; TELFER, D.J. (2002): *Aspects of Tourism. Tourism and Development concepts and Issues*. Ed: Richard Sharpley and David J. Telfer. British Library.

SHARPLEY, R.; TELFER, D.J. (2014): *Tourism and Development: Concepts and Issues*. Channel View Publication: Bristol, UK.

STEWART, B.T.; GYEDU, A.; QUANSAH, R.; ADDO, W.L.; AFOKO, A.; AGBENORKU, P.; BAFFOE, P. (2016): District-level hospital trauma care audit filters: Delphi technique for defining context-appropriate indicators for quality improvement initiative evaluation in developing countries. *Injury*, 47 (1), 211-219.

STIGLITZ, J.; SEN, A.; FITOUSSI, J.P. (2009): *Report of the Commission on the Measurement of Economic Performance and Social Progress (CMEPSP)*. Paris.

STORPER, M.; HARRISON, B. (1992): *Flexibilidad, jerarquía y desarrollo regional: Los cambios de estructura de los sistemas productivos industriales y sus nuevas formas de articulación del poder en los años 90*. Benko, G. y Lipietz, A (eds.), 255-279.

TORRES, A.; PALOMEQUE, F.L. (2014): Measuring sustainable tourism at the municipal level. *Annals of Tourism Research*, 49, 122-137.

TURNER L. Y ASH, J. (1975): *La Horda dorada. El turismo internacional y la periferia del placer, 1991*. Madrid: Endymion.

VALLS, J.F. (1996): *Las claves del mercado turístico: cómo competir en el nuevo entorno*. Bilbao: Deusto, España.

VÁZQUEZ, A. (2000): *Desarrollo económico local y descentralización: aproximación a un marco conceptual*. Madrid: CEPAL/GTZ.

VALENZUELA, G.; SALGADO, J.C.; DÍAZ-ALVARADO, F.A. (2016): Sustainability indicators for the assessment of eco-industrial parks: classification and criteria for selection.

Journal of Cleaner Production, 133, 99-116.

VANHOVE, N. (2015): *Tourism as a Strategic Option for Development of Less Regions. In Tourism and Leisure*; Pechlaner, H., Smeral, E., Eds.; Springer Fachmedien Wiesbaden: German, 95-113.

VÁZQUEZ-BARQUERO A. (1988): *Desarrollo local. Una estrategia de creación de empleo*. Editorial Pirámide, Madrid.

VÁZQUEZ BARQUERO, A. (2002): *Endogenous Development. Networking, innovation, institutions and cities*. Routledge Studies in Developmental Economics, Taylor & Francis Group, London and New York.

VÁZQUEZ BARQUERO, A. (2005): *Las nuevas fuerzas del desarrollo*. Antonio Bosch Editor, Barcelona, España.

VELEVA, V.; ELLENBECKER, M. (2001): Indicators of sustainable production: framework and methodology. *Journal of Cleaner Production*, 9 (6), 519-549.

VENCE, X. (2013): *Crise e fracaso da União Europeia neoliberal. Unha alternativa soberanista e democrática*. Fundación Galiza Sempre, Santiago de Compostela.

WANG, J. (2007): *Industrial Clusters in China: the low road versus the high road in cluster development*, en A. Scott y G. Garofoli (eds.) *Development on the Ground*. Londres y Nueva York, Routledge.

WEIDENFELD, A.; HALL, M.C. (2014): *Tourism in the Development of Regional and Sectoral Innovation Systems*, In *The Wiley Blackwell Companion to Tourism*; Lew, A.A., Hall, C.M., Williams, A.M., Eds.; Wiley Blackwell: Hoboken, NJ, USA, 578-588.

Agradecimientos: Este trabajo es resultado del Proyecto “CEMTUR CANARIAS: Configuración Espacial, Calidad y Cualificación del Empleo Turístico en Territorios Insulares Fragmentados”, aprobado por la Fundación CajaCanarias y realizado en colaboración con el Observatorio Canario del Empleo y la Formación Profesional (OBECAN), el Instituto Canario de Estadístico (ISTAC), La Fundación Canaria para el Fomento del Trabajo (FUNCATRA) y la Fundación General Universidad de La Laguna (FGULL).



Comunicaciones

XXXIII

CONGRESO INTERNACIONAL
DE **ECONOMÍA APLICADA**

Asepelt

2019

economía azul

Universida_{de}Vigo



Asepelt

Asociación Internacional de Economía Aplicada



FOMENTO DEL DESARROLLO COMUNITARIO SUSTENTABLE EN PUEBLOS ORIGINARIOS DEL ESTADO DE MÉXICO PARA SU SEGURIDAD ALIMENTARIA

KARLA VIOLETA PILLADO ALBARRÁN

Centro de Estudios e Investigación en Desarrollo Sustentable/UAEMEX
Matamoros 1007, Col. Universidad, C.P. 50130 Toluca, México

JAVIER JESÚS RAMÍREZ HERNÁNDEZ

Centro de Estudios e Investigación en Desarrollo Sustentable/UAEMEX
Matamoros 1007, Col. Universidad, C.P. 50130 Toluca, México

EDISA ALEJO RAMÍREZ

Instituto de Ciencias Agropecuarias y Rurales/UAEMEX
Campus El Cerrillo Piedras Blancas, Toluca, C.P. 50090

e-mail Karla Violeta Pillado: violeta240286@yahoo.com.mx

Resumen

En el norte del Estado de México se encuentran ubicados pueblos originarios con alto grado de marginación y pobreza, uno de estos pueblos es Pathe Mula de los Cedros, comunidad que busca mitigar los fenómenos de marginación y pobreza. El referente teórico es el Desarrollo Comunitario Sustentable (DCS), un enfoque epistemológico basado en el pensamiento ambiental del sur, que busca mejorar las condiciones de las comunidades originarias y campesinas con base en la práctica y fomento de sus técnicas, tecnologías y saberes tradicionales. La metodología empleada es el Análisis y Desarrollo de Mercados (AyDM), esta establece técnicas de intervención y coparticipación con los pobladores para generar unidades familiares comunitarias, desde la identificación de la materia prima hasta la comercialización de productos, sin perder de vista el manejo sustentable del ecosistema. Resultó que la integración del DCS y el AyDM permitieron diagnosticar con qué recursos naturales, que yacen en la comunidad, se pueden formar unidades familiares comunitarias, los recursos identificados son: sanacoche, tabaquillo, maíz palomero y capulín; la transformación de estos recursos se basa en la manufactura artesanal. Se concluye que la integración del DCS y el AyDM permite formular estrategias para un desarrollo multidimensional gestionado por los pobladores, revalorar las sabidurías ancestrales en la intervención de la activación colectiva de modos de producción, recuperar y el fortalecer la cultura y la economía local. Además, con base en la intervención comunitaria se propone un plan de seguridad alimentaria que busca revalorar las prácticas y sabidurías locales.

Palabras clave: Desarrollo Comunitario Sustentable, Análisis y Desarrollo de Mercados, Sustentabilidad, Seguridad Alimentaria, Pueblos Originarios.

Abstract

The north of the State of Mexico, has a high percentage of indigenous peoples with a high degree of marginalization and poverty, one of them: Pathe Mula de los Cedros, a community that seeks to mitigate the phenomena of marginalization and poverty. The theoretical reference is the Sustainable Community Development (DCS), an epistemological approach based on the environmental thinking of the south, which seeks to improve the conditions of indigenous and peasant communities based on the practice and promotion of their traditional techniques, technologies and knowledge. The methodology used is Market Analysis and Development (AyDM), which establishes intervention and co-participation techniques with villagers to generate community family units, from the identification of the raw material to the commercialization of products, without losing sight of sustainable management of the ecosystem. It turned out that the integration of the DCS and the AyDM made it possible to diagnose with what natural resources, which lie in the community, can be formed community family units, the identified resources are: sanacoche, tabaquillo, popcorn and capulín; the transformation of these resources is based on artisanal manufacturing. It is concluded that the integration of the DCS and the AyDM allows to formulate strategies for a multidimensional development managed by the villagers, to revalue the ancestral wisdoms in the intervention of the collective activation of modes of production, recover and strengthen the culture and the local economy. In addition, based on community intervention, a food security plan is proposed that seeks to revalue local practices and wisdom.

Keywords: Sustainable Community Development, Analysis and Development of Markets, Sustainability, Food Security, Indigenous Peoples

Clasificación JEL: O13, O18, Q12.

Thematic Area 2 : National, Regional and Local Economy

1. INTRODUCCIÓN

La situación de los pueblos originarios en México es un tema principalmente abordado como un hecho o fenómeno sociológico o antropológico, aunque no es excluyente. Desde otras disciplinas se están adentrándose en el estudio de estos colectivos con diversos ámbitos como la economía, la ciencia política, incluso o la medicina y la ecología. Por tal razón, no debe extrañar su análisis bajo la visión de la sustentabilidad.

En el centro de México, específicamente el Estado de México se encuentran asentados pueblos originarios, tanto al sur como al norte, se caracterizan por estar en zonas rurales y tener registros de condiciones socioeconómicas y sociodemográficas adversas, con ello se muestran en una situación de rezago social y económico. Por tal razón, el objetivo del presente trabajo es proponer el fomento del desarrollo comunitario sustentable por medio de proyectos productivos comunitarios en la comunidad Pathe Mula de los Cedros, municipio de San Felipe del Progreso, Estado de México.

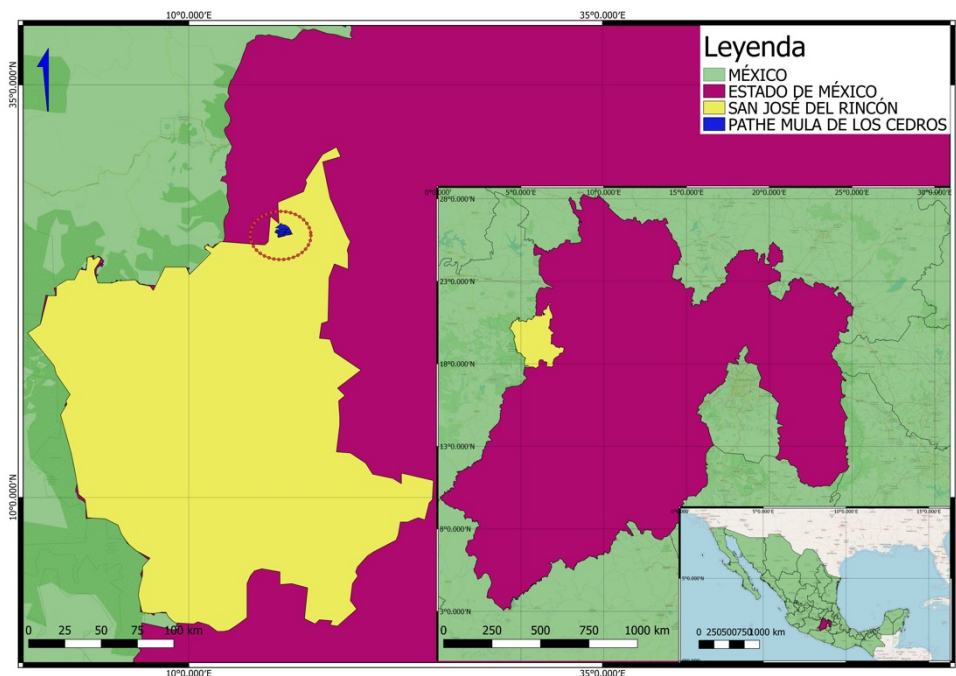
Así, se proponen actividades productivas en la comunidad, basadas en la participación de los habitantes, desde la identificación de saberes tradicionales a rescatar para generar desarrollo, hasta la organización de sus actividades productivas, móvil de dicho desarrollo.

2. ANTECEDENTES

En primer término, la situación socioeconómica del municipio San José del Rincón, al cual pertenece la comunidad de estudio es pertinente entrar a analizarla (véase Mapa 1). Dicha municipalidad está clasificada en el grupo de municipios con alto grado de pobreza, rezago y marginación social, por tanto, en las comunidades que lo integran, como Pathe Mula, se ve reflejada esta condición, que prácticamente no ha cambiado en años recientes.

De acuerdo con SEDESOL (2010) y CONEVAL (2010) señalan en 2010 sobre la situación de la población del municipio, sus habitantes estaban clasificados en pobreza moderada 58,331 habitantes (83.6% de la población) y en pobreza extrema 33,014 habitantes (47.3%). Por su parte, en la medición de marginación, se observa que está clasificado con un nivel alto (véase **Cuadro 1**).

Mapa 1 Ubicación geográfica de Pathe Mula de los Cedros, San José del Rincón, Estado de México, México



Fuente: Elaboración propia con base en INEGI (2005). Información Topográfica Digital Escala 1:250 000 serie III.

Cuadro 1. Situación socioeconómica: Indicadores de marginación, Municipio de San José del Rincón, Estado de México

Concepto	Unidad de registro	2005	2010
Población total	Habitantes	79,945	91,345
Población de 15 años o más analfabeta	Porcentaje	22.73	19.66
Población de 15 años o más sin primaria completa	Porcentaje	50.52	43.49
Ocupantes en viviendas particulares habitadas sin drenaje ni excusado	Porcentaje	31.79	15.23
Ocupantes en viviendas particulares habitadas sin energía eléctrica	Porcentaje	11.69	5.35
Ocupantes en viviendas particulares habitadas sin agua entubada	Porcentaje	41.58	32.61
Viviendas particulares habitadas con algún nivel de hacinamiento	Porcentaje	70.50	66.36
Ocupantes en viviendas particulares habitadas con piso de tierra	Porcentaje	36.90	11.70
Población en localidades con menos de 5 mil habitantes	Porcentaje	100.00	100.00
Índice de marginación	Número índice	0.95542	0.88512
Grado de marginación	Clasificación	Alto	Alto
Lugar que ocupa en el contexto nacional		436	477

Fuente: CONEVAL (2011).

3. MARCO REFERENCIAL

El término de desarrollo se ha definido cuantitativa y cualitativamente, ha servido para unificar las condiciones de procesos económicos, sociales, culturales, inclusive tecnológicos. En tales ámbitos se entiende como el progreso, crecimiento o avance en la satisfacción de necesidades de tales procesos (González, 2009).

El estudio del desarrollo recae en diferentes corrientes de pensamiento, cada una con teorías específicas. En las ciencias sociales el desarrollo se asocia con la conformación de la familia, las asociaciones, las ciudades y los Estados; por su parte las ciencias económicas analizan la sucesión de formaciones económico-sociales, tales como las fases del capitalismo, la industrialización, la expansión de las llamadas “primeras potencias mundiales”, así como el colonialismo que emprendieron éstas en África, Asia y América (Carral, 2012).

Es posible establecer dos enfoques respecto del desarrollo, en primer lugar, la postura hegemónica desde occidente y otra desde la alteridad. En primer término, el Desarrollo Occidental es un constructo que se basa en las teorías de la Modernización, Estructuralista y Neoliberal, representa la ideología de organismos internacionales hegemónicas que influyen en la toma de decisiones para elaborar políticas de sus países miembros (Lichtensztein, 2012; FMI, 2016).

En segundo término, la alteridad: el Desarrollo del Sur, tiene fundamento en las teorías alternativas, las cuales critican las vías y consecuencias del modelo de desarrollo hegemónico. El Desarrollo del Sur, también llamado el otro desarrollo, desarrollo unificado o desarrollo integral tiene como principios: 1) ser generado para la satisfacción de las necesidades, 2) ser endógeno y autónomo, 3) estar en armonía con el medio ambiente, y 4) basarse en transformaciones estructurales (Wolfe, 1976; Valcárcel, 2006). Uno de los enfoques del desarrollo del sur es el Desarrollo Comunitario Sustentable (DCS).

3.1 DESARROLLO COMUNITARIO SUSTENTABLE

Enfoque surgido en México, tiene como base el diálogo de saberes y el saber ambiental. El DCS analiza los problemas ambientales a partir del modo capitalista de producción como proceso histórico, estudia a los campesinos y las causas de la pobreza, argumenta que las soluciones surgen de la comunidad; además promueve el rescate y uso de las tecnologías indígenas a través de la agroecología. Este enfoque puntualiza en el análisis del desarrollo de las comunidades marginadas y originarias (Tetreault, 2004).

El dialogo de saberes es la interrelación entre los conocimientos generados por la ciencia moderna con los saberes ancestrales de los pueblos originarios campesinos. Este dialogo de saberes va de lo inter a lo transcienceífico. Mientras que la ciencia occidental moderna prioriza en el materialismo del universo que relega y subjetiviza la vida indígena, el diálogo de saberes fundamenta la comprensión del vínculo de lo espiritual en la vida social y material de los pueblos originarios (Delgado y Rist, 2016).

El saber ambiental integra principios y valores de la ética ecologista, las sabidurías y prácticas tradicionales de manejo de los recursos naturales, sirve de soporte a las estrategias del desarrollo sustentable. De acuerdo con Leff (1998):

Este saber emerge de un proceso transdisciplinario de problematización y transformación de los paradigmas dominantes del conocimiento; trasciende a las

teorías ecologistas, a los enfoques energetistas y a los métodos holísticos en el estudio de los procesos sociales... integra fenómenos naturales y sociales y articula procesos materiales que conservan su especificidad ontológica y epistemológica, irreductible a un metaproceto homologador y a un logos unificador (p. 127).

Es de relevancia enfatizar que el DCS es una propuesta epistemológica en construcción con antecedentes en el desarrollo comunitario, el desarrollo endógeno, el desarrollo rural y el desarrollo sustentable. El desarrollo comunitario supone que los campesinos pueden planificar programas de autoayuda para promover el desarrollo en el medio rural; mientras que el desarrollo endógeno reconoce el derecho de cada nación a preservar su propia cultura y se basa en la iniciativa del pueblo; por su parte el desarrollo rural se enfoca en el universo agrícola. Finalmente el desarrollo sustentable tiene raíces en la agroecología, la etnoecología y la política ecológica, enfatiza en la preservación de los recursos naturales y la formación de unidades familiares, comunidades y regiones económicamente autosuficientes (Ceña, 1994; Toledo, 1996a, 1996b, 1999).

El DCS surge con la crítica a la política pública: Sistema Alimentario Mexicano, creada por el gobierno mexicano de los años de 1970. El DCS es un constructo reflexivo construido por Toledo, en el que denuncia las consecuencias ambientales de una producción alimentaria modernizada, que promueve la acumulación de capital por parte de la agroindustria y mina a los pequeños productores, que atenta contra sus medios de producción tradicionales, y la renovabilidad de los recursos naturales de sus comunidades (Toledo et al., 1985).

Para el DCS, una producción autosostenida y permanente es aquella que permite y aprovecha la continua renovación de su base material, sus estrategias de autosuficiencia deben enfrentar el carácter aleatorio de las lluvias y a los ciclos climáticos característicos de las eco-regiones del país, lo que supone planificar acciones que cubran los tres sectores productores de alimentos -agricultura, ganadería y pesca-, sostiene que la producción campesina constituye una economía en la que hay un predominio relativo del valor de uso sobre el valor de cambio, dado que hay un intercambio con la naturaleza y no con el mercado, por lo que no se atenta contra la renovación de los ecosistemas (Toledo et al., 1985).

Así mismo, los mecanismos de producción que propone el DCS buscan una armonía con las leyes ecológicas: 1) todo está relacionado con todo lo demás, 2) todas las cosas van a parar a algún sitio, 3) la naturaleza sabe más, y 4) nada procede de la nada, dichas leyes que fueron estudiadas desde el siglo II a.C. por Epicuro de Samos bajo el enfoque de la física (Bellamy, 2000).

Una de las finalidades del DCS es lograr la autosuficiencia de los productores, las localidades y las regiones a través de una estrategia productiva multidimensional (múltiples ecosistemas con múltiples especies generan múltiples productos). La producción multidimensional garantiza la seguridad alimentaria debido a la diversidad de productos en todo el ciclo agrícola. Asimismo, el DCS, contempla los conocimientos indígenas como una sabiduría conformada por sistemas de clasificación de cada uno de los elementos del ecosistema regional, a partir de los cuales se adecuan y aplican tecnologías como estrategias de producción, además de crearse modos de vida específicos (Toledo et al., 1985; Toledo, 1989).

El DCS debe integrar tecnologías especializadas que diversifiquen la producción a través del reconocimiento de la diversidad ecogeográfica, debe fortalecer la capacidad productiva de los ecosistemas, pero con un bajo impacto ambiental, además de fomentar obras de conservación y restauración, e incorporar las sabidurías tradicionales (Toledo et al., 1989).

Toledo (1996b) presenta una propuesta de seis dimensiones o pilares para el desarrollo sustentable de las comunidades campesinas e indígenas (véase **Cuadro 2**):

Cuadro 2. Dimensiones del Desarrollo Comunitario Sustentable

Dimensión	Definición
Toma de control territorial	Se refiere a la delimitación del espacio de la comunidad para que ésta tenga un reconocimiento ante el Estado, otras comunidades y los vecinos
Toma de control de los recursos naturales	Consiste en el uso adecuado de la flora, fauna, suelos, recursos hidráulicos, etc., a través de un plan de manejo de los recursos naturales que contenga un diagnóstico, un inventario, y un Sistema de Información Geográfica, para lograr evaluar la oferta ecológica de los recursos del territorio de la comunidad
Toma de control cultural	Se vincula con la toma de decisiones de la comunidad para la salvaguarda de sus propios valores culturales, la lengua, vestimentas, costumbres, conocimientos, creencias, hábitos, etc., mediante la toma de conciencia de la propia cultura (orgullo étnico)
Toma de control social	Se integra por los aspectos referidos a alimentación, salud, educación, vivienda, sanidad, esparcimiento e información y se busca que sean lo más óptimos posible para generar una calidad de vida alta
Toma de control económico	Es aquel que comprende las políticas de fijación de precios, las políticas macroeconómicas, los subsidios, impuestos, préstamos, etc. En sí es la regulación de los intercambios económicos de la comunidad con el resto de la sociedad y con los mercados locales, regionales, nacionales e internacionales
Toma de control político	Se fundamenta en la capacidad de la comunidad para crear su propia organización, promulgar o ratificar las normas, reglas y principios que rigen la vida política de la comunidad. Asegurar la participación de los miembros, la democracia comunitaria, la autonomía política y la ejecución del derecho consuetudinario

Fuente: Elaboración propia con base en Toledo (1996b).

Estas dimensiones procuran llevar a cabo un proceso de desarrollo comunitario en el que los pobladores tomen el control de su devenir a través de la administración de sus recursos naturales, culturales, económicos y humanos. Se enfoca principalmente en poblaciones tradicionales por ser las que salvaguardan el patrimonio biocultural del mundo. El criterio más importante para identificar a la población tradicional (campesinos, pastores, cazadores y pescadores artesanales) es la escala de la producción, que debe ser de pequeña escala, y el manejo tradicional de la naturaleza: fuerza humana o animal, viento, agua y biomasa (Toledo y Barrera, 2008).

Los conocimientos tradicionales de las comunidades originarias campesinas se ven amenazados por una tendencia modernizante que tiende hacia la homogenización de la cultura, a una cultura global en la que sus saberes se pierden en el tejido urbano, industrial y capitalista. En este sentido el DCS valora la naturaleza y los elementos: biológicos, genéticos, lingüísticos, cognitivos, agrícolas

y paisajísticos, que giran en torno a ella, pues son elementos que caracterizan el patrimonio biocultural de las comunidades (Moreno, Toledo, y Casas, 2013). Este patrimonio biocultural perpetúa los modos de vida tradicional dando lugar a “conciencias históricas comunitarias” (Toledo y Barrera, 2008).

La producción sustentable que pregona el DCS se funda en la deconstrucción de la racionalidad económico-ecológica-jurídica que orienta y legaliza los procesos de capitalización de la naturaleza y la cultura, además descentraliza los procesos de desarrollo, se propone como una racionalidad fundada en los valores asignados a la naturaleza desde la cultura. Es una estrategia de reapropiación de la naturaleza basada en la valorización cultural, económica y tecnológica de los bienes y servicios ambientales. Esta racionalidad ambiental contempla la autogestión de los recursos naturales de las comunidades como una base sólida para lograr la sustentabilidad (Leff, 2004).

El DCS atiende las limitantes que existen en las comunidades y coartan su autodeterminación, a través de este enfoque se pueden analizar los saberes tradicionales que están en peligro de ser olvidados y recuperarlos, pues estos saberes son la base de las actividades de sustento local.

De acuerdo con estudios realizados en comunidades originarias y campesinas, por Toledo y Barrera (2008), entre otros temas, la seguridad alimentaria es un fenómeno tangible cuando los modos de producción se basan en una producción alimenticia diversificada, cuando se valoran los conocimientos ancestrales sobre el manejo del ecosistema, a partir del cual se generan estrategias de producción local.

Para el DCS, una producción agroalimentaria autosostenida y permanente es aquella que promueve la continua renovación de su base material, se adapta al carácter aleatorio de las lluvias y a los ciclos climáticos, planifica acciones para cubrir los tres sectores productores de alimentos: agricultura, ganadería y pesca (Toledo et al., 1985).

La producción sustentable de alimentos aún es un paradigma, en ella intervienen procesos ambientales, tecnológicos, culturales y sociales que deben ser analizados y explicados desde un enfoque crítico, de acuerdo a Leff (2004) el paradigma de la producción sustentable:

Se funda en las identidades culturales de los productores, toma mayor sentido en las comunidades originarias y campesinas que conservan o que son capaces de reapropiarse productivamente de sus economías locales con base en la revalorización de sus prácticas y saberes tradicionales (p.362).

El DCS apuesta por sistemas agroalimentarios acordes con la ecogeografía y microclima de las comunidades, establece un diálogo de saberes entre los conocimientos ancestrales y los de la ciencia moderna que se enfocan en el logro de una producción diversificada de alimentos que conlleve a una seguridad alimentaria sustentable real. Se contempla la autogestión de los recursos naturales como una base sólida para lograr la sustentabilidad (Leff, 2004). Con base en este referente teórico se propone el concepto de Seguridad Alimentaria Sustentable (véase **Cuadro 3**):

Cuadro 3. Concepto propuesto de Seguridad Alimentaria Sustentable

Seguridad Alimentaria Sustentable

Desde el Desarrollo Comunitario Sustentable, es una categoría de bienestar social, parte de la identidad cultural del hombre, busca la satisfacción de las necesidades alimentarias de las comunidades mediante el aprovechamiento de su ecogeografía, estimula la producción multidimensional de alimentos que a su vez resulta en la disponibilidad de alimentos diversos para el consumo. La producción multidimensional de alimentos se basa en los conocimientos y técnicas agrícolas ancestrales sobre el manejo y gestión de cada ecogeografía.

Fuente: Elaboración propia con base en Ceña (1994); Toledo (1996a), (1996b), (1999); Altieri y Nicholls (2000); Leff (2004); Tetreault (2004), Cimadamore (2008); Toledo y Barrera (2008).

4. METODOLOGÍA

La base del enfoque del desarrollo comunitario sustentable, está en la participación de los actores locales, en el proceso de rescate de conocimientos y toma de decisiones. Las herramientas para el desarrollo participativo se basan en el principio de que “Participar es decidir” como lo indica Cox (1996).

El proceso participativo parte del reconocimiento y valoración de las formas de vida comunitaria. La investigación se basa en la gestión participativa del enfoque de desarrollo comunitario sustentable, se sustenta en un proceso de aprendizaje de raíz constructivista del “aprender haciendo”. Esto permite que los habitantes inconscientemente se apropien de su derecho de autodeterminación, debido a que persiguen su desarrollo económico, social y cultural.

El Departamento de la Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAO) apoya al desarrollo de capacidades para la creación de unidades productivas comunitarias, a través de su metodología: Análisis y Desarrollo de Mercados (AyDM) (FAO, 2000). Este análisis, AyDM, proporciona a las comunidades mayores oportunidades para generar actividades productivas a partir de los recursos locales, al mismo tiempo ayuda a gestionar y proteger dichos recursos de manera sustentable (FAO, 2013). Por ello se ha adoptado el AyDM y adaptado a los preceptos del DCS con la finalidad de promover la capacidad emprendedora de Pathe Mula de los Cedros que ayude a mejorar sus aspectos sociales, económicos, tecnológicos, legales, sin afectar su ambiente.

La metodología AyDM puede empoderar a productores, fabricantes y comerciantes a planificar y desarrollar unidades productivas comunitarias que sean equitativas, sustentables, ecológicamente apropiadas, socialmente beneficiosas y financieramente viables, en esencia. La principal fortaleza del proceso de AyDM es la alta participación de las comunidades debido a que son los actores primarios, desde la identificación de la materia prima hasta la planificación del manejo del ecosistema.

El AyDM consiste en una fase planificación preliminar seguida de cuatro fases que guían a las comunidades rurales, a través de un proceso participativo simple y claro, para planificar y desarrollar sus unidades productivas comunitarias. En esta investigación se adecuaron las herramientas participativas de la metodología AyDM, si bien se integra de cuatro fases, solo se realizan la fase uno y dos, que son las que permiten identificar las oportunidades de desarrollo y los recursos

disponibles para las unidades productivas comunitarias. La metodología AyDM, permite utilizar métodos y herramientas participativas, éstas deben seleccionarse de acuerdo con las necesidades de los participantes, al contexto local, y a los recursos disponibles.

Las fases llevadas a cabo y las actividades implícitas en las herramientas aplicadas son:

- Fase 1: Evaluación de la situación actual. Herramientas: 1) Identificar las diferencias entre la metodología tradicional de desarrollo de medios de vida y la metodología de desarrollo emprendedor; 2) Habilidades y actitudes de un buen emprendedor; 3) Las diferencias entre un recurso y un producto; 4) Elementos a incluir en la lista de referencia de recursos y productos potenciales (clasificación de recursos); 5) Mapa de la comunidad (presencia y uso de recursos); 6) Matriz de evaluación de recursos.

- Fase 2: Desarrollo de herramientas participativas para seleccionar los productos e identificar las ideas de la unidad productiva comunitaria. Herramientas: 7) Calendario de actividades; 8) Listado de recursos y productos existentes; 9) Adición de valor; 10) Evaluación de impacto para medir los cambios de percepción y capacidad de los emprendedores participantes.

Las fases mencionadas se organizan en talleres con los pobladores de la comunidad de Pathe Mula de los Cedros, que son:

Taller 1: “Introducción al enfoque del Desarrollo Comunitario Sustentable”.
Objetivo: difundir el enfoque de DCS y la metodología AyDM.

Taller 2: “Una mirada comunitaria”. Objetivo: identificar con los participantes los recursos de la comunidad”.

Taller 3: “Aprovechamiento y preservación de los recursos de la comunidad”.
Objetivo: recabar información acerca de los recursos cosechados y recolectados, para proponer actividades económicas potenciales que sean la base de desarrollo de la comunidad.

5. RESULTADOS Y PROPUESTAS

5.1. Resultados

La información obtenida permite establecer que los habitantes de Pathe Mula de los Cedros pueden emprender unidades productivas comunitarias, cuentan con recursos potenciales que únicamente han sido aprovechados para autoconsumo. Según el mapa de recursos, existe la posibilidad de elaborar productos artesanales comestibles y de ornato. Los pobladores reconocieron que el policultivo les ha permitido autoabastecerse de alimentos, pero han tenido que buscar otras fuentes de empleo para satisfacer sus demás necesidades; asimismo, indicaron que sería de gran ayuda crear una unidad productiva comunitaria para aprovechar de manera adecuada los recursos de la comunidad, de esta forma se haría frente al fenómeno migratorio que afecta a los jóvenes de la comunidad.

Debido al involucramiento de los pobladores en los talleres de AyDM, se puede inferir que los participantes sean los gestores de la toma de control de sus procesos ambientales, sociales, culturales, políticos y económicos que los afectan. Ha sido una actividad que les ha permitido analizar sus debilidades y fortalezas,

así como a identificar las áreas de oportunidad para mejorar las condiciones de vida en la comunidad. Llevar a cabo un proyecto productivo les retribuirá ingresos que permitan, entre muchas cosas garantizar su seguridad alimentaria.

De acuerdo con los indicadores generados, las personas desconocen si establecer unidades productivas comunitarias es complicado, así mencionaron que puede ser difícil pero no imposible, consideraron necesario capacitarse en este tema. Igualmente indicaron que para poder ofrecer un producto de calidad es necesario tomar en cuenta las prácticas tradicionales, aunque reconocen la importancia de capacitarse para mejorar sus productos, es decir, están dispuestos para iniciar un diálogo de saberes.

La información obtenida en las plenarios mostró la importancia de revalorizar los recursos naturales y culturales que los pobladores poseen para que perduren, enfatizaron en revalorarlos como una primera etapa del DCS, así es posible afirmar que para los participantes es importante la sustentabilidad de sus recursos.

5.2. ACTIVIDADES PROPUESTAS

5.2.1. DIAGNÓSTICO

La aplicación del AyDM demostró un interés alto, por parte de los pobladores de Pathe Mula de los Cedros, en participar en actividades económicas que promueven el rescate de saberes tradicionales.

La participación en talleres informativos y formativos fue amplia, colaboraron personas de diferentes edades, ocupaciones y escolaridad. Los recursos locales identificados son silvestres y cultivados, en los que se incluyen plantas medicinales y frutales. También se identificaron saberes que se están reduciendo su práctica, como la elaboración de artesanías de fibras vegetales y el cultivo de maguey.

Ante esta situación es posible determinar que apoyar actividades productivas con base en tecnologías y saberes tradicionales incentivará la reactivación de la economía comunitaria, al mismo tiempo de lograr la revalorización de prácticas y costumbres tradicionales que están en peligro de desaparecer.

Los recursos que los habitantes de la comunidad tienen interés en aprovechar para crear sus unidades productivas comunitarias son:

- Sanacoche¹
- Tabaquillo²
- Maíz palomero³
- Capulín⁴

1 (*Sicyos deppei*) recurso forestal no maderable, arbusto trepador perenne de raíz carnosa. Tiene uso: medicinal (raíz), cosmetológico (raíz), jabón (raíz) (Manzanero *et al*, 2009).

2 (*Satureja macrostema*) recurso forestal no maderable, arbusto con olor a menta, propio climas templados. Tiene uso: medicinal (hojas), condimento (hojas), verdura (hojas), ritual y ornamental (tallos y hojas) (Ortega y Vázquez, 2014).

3 (*Zea mays everta*) es una variedad de maíz que en altas temperaturas revienta y genera las palomitas (conocidos también como *pop corn*). Específicamente en la comunidad tienen un uso ritual: elaboración de adornos de culto religioso (Romero *et al*, 2006). Otros usos son: combustible (olotes), rastrojo (tallos y hojas secas), hortaliza (fruto tierno).

4 (*Prunus serotina subsp. capulí*) es un árbol o arbusto perennifolio o caducifolio que alcanza una altura de 5 a 15 m. Tiene frutos esféricos de 12 a 20 mm de diámetro, de color negro rojizo y sabor

Con base en lo anterior, se elabora una matriz de recursos identificados y criterios considerados para fomentar actividades productivas que ha manifestado los integrantes de la comunidad que están dispuestos a participar (véase cuadro 4).

De acuerdo con estas cuatro actividades productivas propuestas, se plantea una llevar a cabo un conjunto de actividades organizadas que reflejan pluriactividad. De esa manera, los habitantes participarían en las diferentes etapas de las actividades, esto permitirá generar empleo al menos a 15 personas en todo el año, con diferente intensidad según la estacionalidad de la producción o la comercialización. Las actividades a desarrollar para cada recurso son: procesos de cultivo, manejo del recurso, transformación y comercialización, todo organizado de manera artesanal o tradicional.

Cuadro 4. Recursos identificados y criterios para fomentar actividades productivas en la comunidad

Criterio	Recursos			
	Sanacoche	Tabaquillo	Maíz palomero	Capulín
Objetivo de la actividad productiva	Elaborar artesanalmente barras de jabón biodegradable a base de sanacoche	Elaborar artesanalmente bolsas de té con la planta de tabaquillo	Elaborar artesanalmente palomitas de maíz	Elaborar artesanalmente mermeladas en frascos con capulín
Potencial de creación de empleo	Alto	Alto	Alto	Alto
Impacto en cuestión de género	Actividad realizada por hombres y mujeres en equidad	Actividad realizada por hombres y mujeres	Actividad realizada por hombres y mujeres	Actividad realizada por hombres y mujeres
Experiencia con el recurso	Alta: existe un saber-hacer, arraigo y sentido de pertenencia Identidad cultural y territorial	Alta: existe un saber-hacer, arraigo y sentido de pertenencia	Alta: existe un saber-hacer, arraigo y sentido de pertenencia	Alta: existe un saber-hacer, arraigo y sentido de pertenencia
Beneficios directos para la comunidad	Positivos: generación de ingresos y generación de actividades productivas	Positivos: generación de ingresos	Positivos: generación de ingresos	Positivos: generación de ingresos
Suministro (disponibilidad) de la materia prima	Moderado	Alto	Moderado	Alto
Temporalidad en la disponibilidad del recurso	Todo el año	Todo el año	Estacional	Estacional
Plan de manejo del recurso	Inventario y propagación y cultivo del recurso	Inventario y propagación y cultivo del recurso	Inventario y propagación y cultivo del recurso	Inventario y propagación y cultivo del recurso

agridulce. Tiene uso: comestible (fruto), combustible (madera), construcción (madera), insecticida (hoja y semillas) y medicinal (corteza, hoja y fruto) (Vázquez *et al*, 1999).

Producto enfocado a un nicho de mercado: Comercio Justo	Preferencias del consumidor por productos ecológicos y artesanales	Preferencias del consumidor por productos ecológicos y artesanales	Preferencias del consumidor por productos ecológicos y artesanales	Preferencias del consumidor por productos ecológicos y artesanales
Número de trabajadores empleados	15 personas empleadas			

Fuente: Elaboración propia con base en trabajo de campo.

5.2.2. DISEÑO DE UN PLAN DE SEGURIDAD ALIMENTARIA

Durante los talleres se identificó que los pobladores de la comunidad realizan ciertas prácticas productivas, que mediante una conducción y planificación oportuna, pueden garantizar la seguridad alimentaria a nivel local.

Diseñar un plan de seguridad alimentaria bajo el enfoque del DCS pretende reactivar y revalorar la sabiduría ancestral de la comunidad, a través de la promoción del empoderamiento de sus miembros, para asegurar el derecho humano de la alimentación, es una alternativa viable en el logro de un estado de mayor bienestar de Pathe Mula de los Cedros. Se busca vincular a las cosmovisiones y cosmogonías para alcanzar un modo de vida equilibrando: naturaleza-sociedad-cultura-economía-política.

La finalidad del plan de seguridad alimentaria es que los pobladores de Pathe Mula de los Cedros continúen con sus patrones de alimentación tradicional, que se basa en el sistema de producción conocido como milpa (producción de policultivo), del cual obtienen: maíz, frijol, habas, hortalizas y frutales; además de la práctica de recolección de hongos y quelites en temporada de lluvias y la cría de animales de corral: gallinas, guajolotes (pavos), vacas, borregos, chivas (cabras), conejos, que son tanto para autoconsumo como para la venta.

El conjunto de actividades estructuradas considera los siguientes puntos:

1. Recuperar los saberes agrícolas ancestrales sobre las técnicas de producción de los alimentos endémicos: maíz, quelites, hongos, frutales, hortalizas y leguminosas, cada uno en sus diversas variedades.
2. Asesorar a las productoras y productores de la comunidad con prácticas y técnicas agroecológicas que ayuden a aumentar la producción de alimentos y a gestionar el manejo de los recursos de manera sustentable.
3. Dinamizar y diversificar el sistema agroalimentario local mediante la producción multidimensional, rotar cultivos a lo largo del ciclo agrícola para contar con una producción constante.
4. Continuar con la práctica de policultivos y la cría de animales de corral, tanto para el autoconsumo, como para la venta y trueque entre vecinos.
5. Organizar, con la ayuda del Delegado (autoridad local), un día de tianguis (mercado ambulante) dentro de la comunidad, para que la venta y trueque de alimentos tenga mayor eficacia.
6. Promover el consumo de los alimentos producidos localmente mediante reuniones de vecinos y charlas en las escuelas, con los estudiantes y padres de familia.

7. Educar para reorientar el mensaje de la publicidad de los alimentos no saludables, en la comunidad y principalmente en los centros de educación.
8. Fomentar el comercio local entre vecinos y comunidades para lograr un pronto acceso a los alimentos.

De esta manera, se pretende que la comunidad comience a autodeterminarse, a tomar la decisión de sus modos de producción con base en su sabiduría tradicional.

6. CONCLUSIONES

A pesar de la condición de marginación y pobreza en la que viven los pobladores de Pathe Mula de los Cedros, se presenta una disposición de recursos naturales locales que pueden dar pauta al establecimiento de unidades productivas comunitarias que ayuden a dinamizar la economía local y superar el fenómeno de la pobreza.

La integración del DCS y el AyDM ayudo a formular estrategias para un desarrollo multidimensional manejado por los pobladores de la comunidad. La revalorización del dialogo de saberes en la intervención para la activación colectiva de modos de producción, la recuperación y el fortalecimiento de la cultura y la economía local, son factores que permean en el logro de la gestión del territorio, el ambiente y la vida social.

El empleo de herramientas participativas integró a los habitantes en un ambiente de reconocimiento, proyección y organización para generar propuestas de transformación de la vida comunitaria. El trabajo en equipo es una práctica familiar, cada miembro asume un rol y desempeña ciertas actividades, no obstante la participación de hombres y mujeres es equitativa.

El diagnóstico permitió identificar usos alternativos del territorio, establecer nuevas actividades económicas que ofrezcan mejores y más oportunidades de empleo, así como a proponer un plan de seguridad alimentaria basado en las prácticas y sabidurías tradicionales.

REFERENCIAS

- BARKIN, D. (2002) El desarrollo autónomo: un camino a la sostenibilidad. En Ecología Política. Naturaleza, sociedad y utopía. CLACSO: Buenos Aires
- BELLAMY, J. (2000). La ecología de Marx. Materialismo y naturaleza. España: El viejo topo.
- BULA, J. I. (1994). John Rawls y la teoría de la modernización. Una retrospectiva analítica. Cuadernos de Economía, vol. XIV, no. 21, p. 67–83.
- CALDERÓN, F. J. (2008). Thinking on Development: Enfoques teóricos y Paradigmas del Desarrollo.
- CARRAL T., V. M. (2012) Nuevas alternativas de desarrollo local en México: Sistemas Agroalimentarios Localizados. Tesis de Licenciatura, Facultad de Ciencias Políticas y Sociales, Universidad Nacional Autónoma de México, México
- CEÑA, F. (1994). Planteamientos económicos del desarrollo rural: perspectiva histórica. Revista de Estudios Agro-Sociales, (169), 11–52. Recuperado de <http://helvia.uco.es/xmlui/bitstream/handle/10396/5705/rea.7.pdf?sequence=1>
- COMMONER, B. (1971) The Closing Circle: Nature, Man, and Technology, Nueva York

- CONAPO (2010). Índice de marginación por entidad federativa y municipio. http://www.conapo.gob.mx/work/models/CONAPO/indices_margina/mf2010/CapitulosPD/F/1_4.pdf
- COX, R. (1996). El saber local. Metodologías y técnicas participativas. NOGUBCOSUDE/CAF. Bolivia.
- DELGADO, F., Y RIST, S. (2016). Ciencias, diálogo de saberes y transdisciplinariedad. Aportes teórico metodológicos para la sustentabilidad alimentaria y del desarrollo. Bolivia: AGRUCO.
- ELBERS, J. (2013). Ciencia holística para el buen vivir: una introducción. Quito: Centro Ecuatoriano de Derecho Ambiental.
- ESCOBAR, A. (1995) Encountering Development. The making and the Unmaking of the Third World, Princeton University Press, Princeton.
- ESCOBAR, A. (2007). La invención del Tercer Mundo Construcción y deconstrucción del desarrollo. [Libro en línea] Venezuela: Fundación Editorial el perro y la rana. <http://www.cronicon.net/paginas/Documentos/No.10.pdf> [25 de agosto de 2018].
- FAO (2013). Empresas Comunitarias de Productos Arbóreos y Forestales: Análisis y Desarrollo de Mercados. Roma, [versión electrónica]. Recuperado el 28 de octubre de 2016 de <http://www.fao.org/forestry/enterprises/25492/es/>
- FMI. (2016). El FMI y los Objetivos de Desarrollo Sostenible. Recuperado de <http://www.imf.org/es/About/Factsheets/Sheets/2016/08/01/16/46/Sustainable-Development-Goals> [25 de agosto de 2018].
- GISBERT, P. (2007) El decrecimiento, camino hacia la sostenibilidad. En: Ecologista, No. 55
- GONZÁLEZ CRUZ, F. (2009) Desarrollo humano sustentable local, Polis [en línea], 22, consultado el 15 de enero de 2019 recuperado de <http://polis.revues.org/2598>
- HUANACUNI, F. (2010). Buen Vivir / Vivir Bien Filosofía, políticas, estrategias y experiencias regionales andinas. Lima: Coordinadora Andina de Organizaciones Indígenas.
- HIDALGO, A. L. (1998). El pensamiento económico sobre desarrollo. De los mercantilistas al PNUD. España: Universidad de Huelva.
- INEGI (2010). Censo de Población y Vivienda 2010. Archivo de resultados definitivos. Recuperado el 12 de mayo de 2017 de <http://www.beta.inegi.org.mx/proyectos/ccpv/2010>
- INEGI (2017a) Indicadores de Marginación. Recuperado el 12 de mayo de 2017 de <http://www.microrregiones.gob.mx/catloc/indiMarginac.aspx?ent=15&mun=124>
- INEGI (2017b) Indicadores de Rezago Social. Recuperado el 12 de mayo de 2017 de <http://www.microrregiones.gob.mx/catloc/indRezSocial.aspx?ent=15&mun=124>
- INEGI (2017c) Indicadores de Carencia en Viviendas. Recuperado el 14 de mayo de 2017 de <http://www.microrregiones.gob.mx/catloc/IndRezViv.aspx?ent=15&mun=124>
- LEFF, E. (1986). Ecología y capital : hacia una perspectiva ambiental del desarrollo. México: Universidad Nacional Autónoma de México.
- LEFF, E. (1998). Saber ambiental. México: Siglo XXI.
- LEFF, E. (2004). Racionalidad ambiental. México: Siglo XXI.
- LEFF, E. (2017). Las relaciones de poder del conocimiento en el campo de la Ecología Política: una mirada desde el sur. En Ecología política latinoamericana : pensamiento crítico, diferencia latinoamericana y rearticulación epistémica, Volumen I, pp. 129–166. Buenos Aires: CLACSO-Universidad Autónoma Metropolitana.
- LICHTENSZTEJN, S. (2012). El Fondo Monetario Internacional y el Banco Mundial. Sus relaciones con el poder financiero. En Economía, UNAM, vol. 9, no. 25, 14–28. Recuperado de <http://www.revistas.unam.mx/index.php/ecu/article/view/45020/40574> [28 de julio de 2018]

- MANZANERO, G. I., FLORES, A., SANDOVAL, E. Y ROBERT BYE (2009). Etnobotánica de siete raíces medicinales en el mercado de Sonora de la Ciudad de México. En: Polibotánica, no. 27, pp. 191-228. Recuperado de www.scielo.org.mx/pdf/polib/n27/n27a11.pdf [20 de marzo de 2019]
- MARTÍNEZ, A., J. (2014). Entre la Economía Ecológica y la Ecología Política. Recuperado de <http://old.sinpermiso.info/articulos/ficheros/10JMAcol.pdf> [15 de junio de 2018]
- MORENO, A. I., TOLEDO, V. M., Y CASAS, A. (2013). Los sistemas agroforestales tradicionales de México: Una aproximación biocultural. En Botanical Sciences, vol. 91, no. 4, pp. 375–398. Recuperado de <https://doi.org/http://dx.doi.org/10.17129/botsci.419> [15 de julio de 2018]
- MTS (2012) Movimiento Nuestra América, consultado en <https://movimientonuestraamerica.wordpress.com/2012/03/05/que-es-el-mst/> el 20 de enero de 2019
- MUCIÑO, M. (2012). Un estudio de los modelos y teorías del desarrollo sustentable. Tesis de Licenciatura, Facultad de Economía, Universidad Autónoma Nacional de México, México.
- ONU. (2017). Desarrollo sostenible. Recuperado de <http://www.un.org/es/sections/what-we-do/promote-s> [12 de agosto de 2018]
- ORTEGA Y VÁZQUEZ (2014). *Satureja macrostema*: situación ambiental, conocimiento local y roles de género. En: Madera y Bosques, vol. 20. no. 2, pp. 71-86 Recuperado de <http://www.scielo.org.mx/pdf/mb/v20n2/v20n2a7.pdf> [21 de marzo de 2019]
- PNUD. (2016). Informe sobre Desarrollo Humano. Roma: ONU
- ROMERO, T.; GONZÁLEZ, L.; REYES, G. (2006) Geografía e historia cultural del maíz palomero toluqueño (*Zea mays everta*). En: Ciencia Ergo Sum, vol. 13, núm. 1, pp. 47-56. Recuperado de <https://www.redalyc.org/articulo.oa?id=10413106> [21 de marzo de 2019]
- SUNKEL, O., Y PAZ, P. (1970). El subdesarrollo latinoamericano y la teoría del desarrollo. México: Siglo XXI. Recuperado de https://repositorio.cepal.org/bitstream/handle/11362/1604/S33098159S1_es.pdf [18 de julio de 2018]
- TAPIA, N. (2008) Aprendiendo el desarrollo endógeno Construyendo la diversidad biocultural, AGRUCO: Bolivia
- TETREULT, D. (2004). Una taxonomía de modelos de desarrollo sustentable. En Espiral, vol. X, no. 29, p. 45–80.
- TOLEDO, V. M. (1996a). Las consecuencias ecológicas de la Ley Agraria de 1992. Revista Estudios Agrarios, (4), s/p. Recuperado de <http://www.pa.gob.mx/publica/pa070407.htm>
- TOLEDO, V. M. (1996b). Principios etnoecológicos para el desarrollo sustentable de comunidades campesinas e indígenas. Temas Clave, CLAES, (4), s/p.
- TOLEDO, V. M. (1999). Campesinidad, agroindustrialidad, sostenibilidad: los fundamentos ecológicos e históricos del desarrollo rural. En Revista de Geografía Agrícola, no. 28, p. 7–19.
- TOLEDO, V. M., CARABIAS, J., MAPES, C., Y TOLEDO, C. (1985). Ecología y autosuficiencia alimentaria: Hacia una opción basada en la diversidad biológica, ecológica y cultural de México. México: Siglo XXI.
- TOLEDO, V. M., Y BARRERA-BASSOLS, N. (2008). La Memoria Biocultural: la importancia ecológica de las sabidurías tradicionales. Barcelona: Icaria.
- TOUSSAINT, E. (2007). Banco Mundial: el golpe de estado permanente. España: El viejo topo.
- VALCÁRCEL, M. (2006). Génesis y evolución del concepto y enfoques sobre el desarrollo. Lima.

VÁZQUEZ, C.; BATIS, A. I.; ALCOCER M. I.; GUAL M.; SÁNCHEZ. C. (1999). Árboles y arbustos potencialmente valiosos para la restauración ecológica y la reforestación. Reporte técnico del proyecto J084. CONABIO -Instituto de Ecología, UNAM. Recuperado de http://www.conabio.gob.mx/institucion/proyectos/resultados/J084_Fichas%20de%20Especies.pdf

http://www.conabio.gob.mx/conocimiento/info_especies/arboles/doctos/60-rosac6m.pdf [18 de marzo de 2019]

VERA, J. (2013). Comparación de los discursos de desarrollo sustentable de la ONU, OCDE y La Vía Campesina. Análisis discursivo desde la Ecología Política. Tesis de Licenciatura, Facultad de Ciencias Políticas-Centro de Estudios Sociológicos, Universidad Nacional Autónoma de México.

WOLFE, M. (1976). Las utopías concretas y su confrontación en el mundo de hoy. Chile: CEPAL.

ANEXO

1. ANÁLISIS Y DESARROLLO DE MERCADOS

De acuerdo con la FAO (2013), el análisis y desarrollo de mercados (AyDM) es una metodología participativa diseñada para brindar asistencia a las poblaciones en el desarrollo de empresas generadoras de ingresos y al mismo tiempo, en la conservación de los recursos forestales y arbóreos.

Además indica que el AyDM se compone de una fase de planificación preliminar y cuatro fases sucesivas (véase **Cuadro 4**):

Cuadro 4. Metodología AyDM

Fases	Actividades
Preliminar	Hacer una investigación de antecedentes y actividades de planificación antes de dar apoyo a las empresas comunitarias.
1.-Evaluación de la situación actual	<ul style="list-style-type: none"> • Evaluar la situación existente • Desarrollar una comprensión de las cuestiones y problemas • Definir las oportunidades • Desarrollar una primera lista corta de los productos
2.- Realización de encuestas para seleccionar los productos e identificar las ideas de la empresa	<ul style="list-style-type: none"> • Identificar productos, mercados y formas de comercialización • Desarrollar una más refinada lista corta de los productos • Decidir sobre los mejores productos y obtener información para el desarrollo de los productos
3.- Preparación del plan de desarrollo empresarial	<ul style="list-style-type: none"> • Preparar planes de desarrollo empresarial • Formular estrategias e identificar los servicios para garantizar el desarrollo sostenible de la empresa
4.- Apoyo a las nuevas empresas para comenzar	<ul style="list-style-type: none"> • Comience la empresa • Obtener capacitación y asistencia adicional para iniciar las actividades de la empresa a nivel piloto • Monitorear y evaluar el desarrollo de la empresa

Fuente: FAO (2013).

GOBERNANZA Y CRISIS FINANCIERA: EL CASO DE LAS CAJAS DE AHORRO ESPAÑOLAS

MARTÍN SEVILLA JIMÉNEZ

Departamento de Análisis Económico Aplicado/Universidad de Alicante
Campus de Sant Vicent del Raspeig 03080. Alicante

TERESA TORREGROSA MARTÍ

Departamento de Análisis Económico Aplicado/Universidad de Alicante
Campus de Sant Vicent del Raspeig 03080. Alicante

MARÍA NÚÑEZ

Departamento de Análisis Económico Aplicado/Universidad de Alicante
Campus de Sant Vicent del Raspeig 03080. Alicante

e-mail Martín Sevilla Jiménez: martin.sevilla@ua.es

Resumen

A pesar del tiempo transcurrido desde lo que se considera como el inicio de la crisis financiera internacional (aproximadamente 2008), no existe una explicación que suscite un amplio consenso en España sobre las causas y los agentes implicados en la misma. La reciente aprobación del Dictamen de la Comisión del Congreso de los Diputados de España en febrero de 2019, en vez de aportar nuevas y sólidas perspectivas sobre las causas de la crisis, a lo que ha contribuido es a abrir nuevas polémicas acerca del alcance de la responsabilidad del Banco de España y la CNMV

Con esta comunicación queremos profundizar en uno de los aspectos que, desde nuestro punto de vista, siguen más desconocidos en la gestación y desarrollo de la crisis: el de la aportación de la Gobernanza de las Cajas de Ahorros a la posible amplificación de la crisis. Como una paradoja más de la resolución de la crisis financiera en España, nos encontramos a día de hoy (2019) sin Cajas de Ahorros y con una Ley de Cajas de 2013 que dice que estas deben volver a sus orígenes. Si esta es la conclusión final, ¿Por qué no se tomaron esas decisiones antes de que el proceso fuera irreversible?

La hipótesis que se trata de contrastar en esta comunicación es la de que a partir de 1977 hubo un desacoplamiento entre las posibilidades de gestión financiera de las Cajas de Ahorro y los órganos de gobernanza que las mismas disponían para desarrollar su labor, no existiendo criterios orientativos de los límites de su operatoria ni desde el punto de vista político ni de los reguladores.

Palabras clave: Crisis financiera 1, Cajas de Ahorros 2, Gobernanza 3, Banco de España 4, Gobierno de España 5.

Eje Temático 3 : Economía del Sector Público. Administración y Gobernanza

Abstract

Despite the time elapsed since what is considered the beginning of the international financial crisis (approximately 2008), there is no explanation that arouses a broad consensus in Spain on the causes and the agents involved in it. The recent approval of the Opinion of the Commission of the Congress of Deputies of Spain in February 2019, instead of providing new and solid perspectives on the causes of the crisis, to which it has contributed is to open new controversies about the scope of the responsibility of the Bank of Spain and the CNMV

With this communication we want to deepen into one of the aspects that, from our point of view, are still more unknown in the gestation and development of the crisis: the contribution of the Governance of the Savings Banks to the possible amplification of the crisis. As a paradox over the resolution of the financial crisis in Spain, we are today (2019) without Savings Banks and with a Savings Banks Act of 2013 that says they must return to their origins. If this is the final conclusion, why were not those decisions made before the process was irreversible?

The hypothesis that is tried to contrast in this communication is the one that from 1977 there was a decoupling between the possibilities of financial management of the Savings Banks and the organs of governance that they had to develop their work, there are no indicative criteria of the limits of its operation neither from the political point of view nor from the regulators.

Key Words: Financial Crisis 1, Savings Banks 2, Governance 3, Bank of Spain 4, Government of Spain 5.

Thematic Area 3 : Economy of the Public Sector. Administration and Governance

1. INTRODUCCIÓN

Durante el desarrollo de la crisis financiera en España de 2008, por parte de todos los agentes implicados se lanzó un supuesto debate acerca de los motivos de la misma y las razones por las que las Cajas de Ahorro habían estado en el centro de la crisis (Sevilla y otros, 2016). Si bien en los momentos actuales (principios de 2019) se ha visto que el alcance de la crisis incluía también a varios bancos (Banco de Valencia, Banco de Madrid, Banco Popular), el núcleo central de las explicaciones de la crisis financiera se ensañó desde el primer momento con el papel de las Cajas de Ahorro en la misma. Salvando a algunas de ellas (La Caixa, Caja Asturias y sus sucesores, Unicaja, Ibercaja o la Kutxa), el resto fueron puestas como ejemplo de cómo el sistema de Cajas de Ahorro españolas había contribuido a ampliar los efectos de la crisis (Quintás, 2018).

Los analistas (Cuñat y Garicano, 2009), las explicaciones del Gobierno en las Exposiciones de motivos de la legislación de 2010, 2011 y, especialmente, la posición del Banco de España, hicieron hincapié en el sistema de gobernanza de las Cajas de Ahorro para explicar su comportamiento.

La idea central de este argumento podía interpretarse como sólida: Las Cajas tenían una mala gobernanza debido a su politización que hacía que sus dirigentes no respondieran a criterios de conocimiento del negocio bancario lo que habría provocado una gestión ineficiente al responder a criterios ajenos a la prudencia que debe imperar en el negocio bancario. Si esto era así, era evidente que la responsabilidad sobre su comportamiento habría que achacarla a este motivo, exonerando al Gobierno y al Banco de España de lo sucedido: la culpa era de los gestores de las entidades.

Este argumento ha ido cobrando fuerza en los años posteriores, quedando de alguna forma consolidado en el ideario colectivo como una tesis cierta. A pesar de todo lo acontecido con posterioridad, esta tesis ha quedado como una idea fija, aunque los postulados más recientes (Ekaizer, 2018, algunas sentencias judiciales como la de Catalunya Caixa de 2019 o el mismo Dictamen del Congreso de los Diputados de 2019. Congreso, 2019), están intentando cambiar este “relato” y aportar más veracidad a lo realmente ocurrido antes de la crisis y durante su desarrollo.

A favor de la consolidación de la idea de la responsabilidad única de los gestores. ha jugado un papel esencial el que las personas acusadas de ser los responsables (los directivos y administradores de las cajas de ahorro), han prestado muy poca atención a tratar de demostrar que eso podría estar equivocado. La avalancha de denuncias y querellas que se han sucedido contra la mayor parte de las Cajas y sus dirigentes, llevadas a cabo por el Banco de España a través del FROB o el FGD (Banco de España, 2017) obligaban a todos los implicados a defenderse individualmente ante los Tribunales, por lo que prácticamente ninguno de ellos ha llevado a cabo una defensa general sobre el funcionamiento de las Cajas de Ahorro para demostrar lo contrario. Bastante tenían con no ser arrastrados a los Tribunales.

Posiblemente, esta defensa debería haber correspondido a la CECA¹. Pero a fecha de hoy, aunque esta entidad sigue existiendo, no se conoce ningún análisis que la misma haya hecho explicando el porqué de la desaparición de todo el sistema de Cajas de Ahorro español. El cambio de la Presidencia de CECA en 2009, en plena crisis, de Quintás por Isidro Fainé (a la sazón, Presidente de La Caixa), ha hecho que esta entidad de representación supuestamente colectiva de todas las Cajas de Ahorro, pase inadvertida en todo este proceso, olvidándose de los problemas colectivos ante los intereses individuales de los que han detentado el poder en todo este periodo. Por su lado, la incorporación de Carlos Ocaña procedente del Ministerio de Economía y Hacienda como Director General de CECA a partir de septiembre de 2011, tampoco supuso que se tuviese una visión independiente en defensa del colectivo de Cajas de Ahorro, más bien lo contrario. ¿Hubiese sido esa la respuesta si hubiesen sido otros el Presidente y el Director General de CECA?²

Pero, volviendo de nuevo a la cuestión del gobierno corporativo ¿de quién era la responsabilidad de que este fuera así en el arranque de la crisis?

Como en muchos otros aspectos relacionados con problemas sociales o económicos, se tiende a analizar estas cuestiones de una forma singular y única, olvidándose en muchas ocasiones de los antecedentes relativamente cercanos sobre los que se podrían haber obtenido enseñanzas que pudieran haber ayudado

¹ Ver (Quintás 2018), (Valle, 2011)

² Serra, (2011) “Cuando el edificio empezó a agrietarse, la CECA se dividió sobre la estrategia a seguir. Rodríguez Zapatero y la ministra Salgado necesitaban un interlocutor respetado y con mano izquierda para definir un nuevo marco regulatorio que fuera aceptado, sin excesivas protestas, por el sector afectado. Consideraban que la persona idónea era Isidro Fainé, cuyas maneras discretas tienden a aplacar ánimos rebeldes y a buscar soluciones temporizadoras cuando hay discrepancias. Efectivamente, Fainé fue proclamado presidente de la CECA con un profundo suspiro de satisfacción de las autoridades competentes, tras algún conato de lucha, rápidamente sofocado, por parte de algún contendiente. Se rompió una tradición. “La Caixa”, a pesar de su poder, siempre se había mostrado discreta en la CECA, sin dar indicios de pretender ocupar la presidencia. Pero no era momento para remilgos y había de pasar a liderar abiertamente la reorganización del sector. El momento exigía que pasara a primera fila y encabezara el proceso. En sus primeras declaraciones, Fainé aseguró que buscaría una reglamentación flexible que permitiera a cada entidad confeccionarse el traje que mejor le sentara. Desconozco si todas las cajas consideran la promesa cumplida. Pero sí resulta claro que “La Caixa” ha podido y sabido, diseñar una estructura que encaja perfectamente con sus características y recoge las exigencias de su estrategia.” (193). Fainé sigue siendo Presidente de la CECA en 2019 y a su vez, Presidente de la Fundación Bancaria “La Caixa”

tanto a prever sus consecuencias como a interpretar lo ocurrido. España no ha sido ajena a tener antecedentes de crisis financieras. La más cercana correspondió al periodo 1977-1985 (Cuervo, 1985).

Cierto es que aquella crisis se centró fundamentalmente en los bancos, quedando las Cajas de Ahorro fuera de esa crisis financiera generalizada, debido a que su funcionamiento estaba todavía tutelado y controlado por la Administración Pública, pero también es cierto que muchos de los argumentos que se utilizaron para explicarla siguen vigentes, aunque con sus peculiaridades, pudiéndose haber extraído varias enseñanzas sobre lo que sucedió que deben ser tenidas en cuenta para la explicación de la crisis actual.

A falta de un informe oficial sobre aquella crisis, el relato que hizo uno de los responsables del saneamiento de esas instituciones financieras nos ayuda a entender lo sucedido en aquel proceso (Cuervo, 1985. De Juan, 1985 y 2017). Quedaba patente que el origen de la crisis había que atribuirlo a la conducta de los banqueros y administradores de bancos por su comportamiento irresponsable (falta de profesionalidad, temeridad y prácticas ilegales), pero también a la *“ausencia de un adecuado marco legal y de un sistema de información que permitiera al Banco Central (el Banco de España) la eficaz vigilancia de la solvencia y el control de las entidades bancarias e hiciera posible una política preventiva de saneamiento financiero que pudiera haber atenuado los efectos de la crisis”* (Cuervo, 1985. pg.34).

Cuervo, a lo largo de su exposición, reitera estas limitaciones del Banco de España para hacer correctamente su labor. Pero resulta difícil mantener que la crisis se prolongara en el tiempo y que no se hubiesen realizado los cambios legales requeridos para no volver a caer en los mismos errores en los periodos posteriores. Es más, al inicio de la crisis de 2008, tanto el Gobierno español como el propio Banco de España defendieron que la solidez del sistema financiero español para afrontar la misma se debía a los cambios introducidos: *“En general, las cajas de ahorros, así como el resto del sistema bancario español, enfrentaron los primeros momentos de la crisis financiera, iniciada en agosto de 2007, sin grandes dificultades, gracias a haber practicado un modelo de banca tradicional y minorista y a la labor supervisora del Banco de España, y a una buena posición en términos de rentabilidad y eficiencia, volumen de provisiones y niveles de capital.”* (Real Decreto Ley /2010 BOE, Pg. 61428) (El subrayado es nuestro)

Pero, además, si existía un riesgo relacionado con la gobernanza de las Cajas de Ahorros, ¿Por qué no se cambió antes?

La cuestión acerca de si se tenían los medios adecuados para actuar en las crisis siempre ha sido polémica y recurrente. En los momentos previos a las crisis, todos quieren tener el máximo nivel de competencias y autonomía. En los momentos posteriores, todos argumentan que no tenían los instrumentos adecuados para tomar las decisiones correctas. ¿Alguien, sabe a ciencia cierta, en los momentos actuales, cuando se han transferido amplias competencias a las instituciones europeas, aunque todavía quedan bastantes en manos de las autoridades españolas, de quién es la responsabilidad si se presenta una nueva crisis?

Un reciente Decreto del Gobierno nos puede situar esta cuestión

“En un sistema financiero complejo e interconectado como el actual, cobra especial importancia velar por la estabilidad y prevenir riesgos potencialmente sistémicos que puedan acabar afectando negativamente a la economía real. Este tipo de riesgos afectan al sistema financiero en su conjunto y derivan de fenómenos tales como el crecimiento desmesurado del precio de determinados activos financieros o inmobiliarios, el aumento a nivel agregado del volumen de crédito, los riesgos asociados a las interdependencias entre entidades o los relacionados con el uso de nuevas tecnologías para la provisión de servicios financieros, entre otros. Durante la última crisis financiera, las herramientas tradicionales de política económica y de supervisión financiera a disposición de las autoridades mostraron sus limitaciones a la hora de prevenir y mitigar parte de estos riesgos.” (Real Decreto 102/2019 de 1 de marzo) (El subrayado es nuestro)

Aunque ponderado como una buena medida por parte de una Editorial de El País³, llama la atención la tardanza en poner en marcha este nuevo instrumento (AMCESFI) que, tal como se presenta, es fundamental para actuar preventivamente en casos de crisis financieras. Pero también es importante destacar que el mismo ya tuvo un precedente importante, el CESFI, el Comité de Estabilidad Financiera, creado precisamente en 2006, antes de la última crisis financiera de 2008 (Vegara, 2006). Pero si eso fue así, ¿para qué sirvió el CESFI?.

En el año 2013, en una comparecencia del Gobernador del Banco de España ya anunciaba la creación del AMCESFI (¡ha tardado 6 años para ponerse en marcha!) y se explicaba que

3 De una forma un tanto crítica, el Editorial destaca lo acertado de la medida, lo que da también idea de que la información no ha sido muy trabajada. *“El objetivo es que no vuelva a producirse la descoordinación institucional observada entre 2008 y 2013 en el tratamiento de la crisis. El informe del Congreso atribuye responsabilidades directas al Banco de España y a la CNMV; pero es evidente que elude las responsabilidades políticas de los partidos que entraron a saco en la gestión de las cajas y relega a un segundo plano la culpabilidad de directivos y consejeros que o no se enteraron o no tuvieron la capacidad técnica suficiente para sanear sus cuentas. De ahí la importancia de la nueva Autoridad; en adelante, será más difícil mirar para otro lado”* El País de 4/3/2019 *“Para prevenir las crisis”*
https://elpais.com/elpais/2019/03/01/opinion/1551461800_26185

“En España ya existe desde 2005 un comité de estabilidad financiera (Cesfi), integrado por Economía, Hacienda, el Banco de España, la CNMV y la Dirección de Seguros. Su objetivo es la prevención y gestión de crisis financieras. Pero parece que no ha tenido demasiado éxito en sus objetivos, a tenor de los resultados.

Cuando se creó se afirmó que “no solo contribuirá al mantenimiento de la estabilidad financiera en nuestro país, sino que además nos permitirá integrarnos plenamente en los próximos desarrollos internacionales en este terreno, al tiempo que hace consistente el esquema de cooperación en el plano nacional y europeo”. Pero sus expectativas fueron más ambiciosas que sus logros, explican fuentes financieras.” Cinco Días 4-6-2013⁴

Con independencia de los enfrentamientos que se puedan haber dado entre el Ministerio de Economía y el Banco de España para controlar este instrumento, lo que ha quedado claro es que el mismo no sirvió para nada y, desgraciadamente, en los próximos años podemos encontrarnos con que esta misma situación, a pesar del cambio de nombre, también siga dándose. Las crisis financieras son recurrentes por lo que en el futuro seguiremos discutiendo acerca de quienes tuvieron la responsabilidad de poner freno a las mismas y, posiblemente, crearemos un nuevo organismo para prevenirlas.

2. LA GOBERNANZA DE LAS CAJAS DE AHORRO: LA IMPORTANCIA DEL REAL DECRETO DE FUENTES QUINTANA EN 1977

El sistema de Cajas de Ahorro español que había funcionado durante un largo periodo de tiempo, fue considerado hasta el comienzo de la crisis del nuevo siglo como un sistema de éxito (Cals, 2007. Arincibia1998). Las mismas habían alcanzado a los bancos en esos últimos años y representaban un 50% del sistema financiero español, estando presentes a través de participaciones en numerosas empresas de nuestro sistema productivo.

Los bancos, a través de la AEB habían estado denunciando una supuesta situación de privilegio de las mismas ya que, mientras que se permitía que las Cajas pudiesen comprar Bancos, no se permitía a estos, con la legislación de aquellos momentos, el comprar Cajas de Ahorro, cosa que sí se ha aprovechado al calor de la crisis no de una forma parcial, si no total, ya que no se puede decir que las cajas sigan existiendo aunque todavía queden las de Pollença, la de Ontinyent, Funcas y.....la Ley de Cajas de 2013.

El sistema de gobernanza de las Cajas, donde los consejeros eran nombrados por cooptación entre ellos mismos no había sido obstáculo para su progresión hasta 1977. De alguna forma, la tutorización y regulación que se hacía sobre las mismas por parte del Ministerio de Economía o del Banco de España para sus operaciones de activo y pasivo había asegurado que las mismas pudiesen operar sin muchos problemas en toda su existencia.

Como se señala de forma precisa, aunque no autocrítica, en el Dictamen del Congreso de los Diputados,

“Con la Ley 26/2013, de 27 de diciembre, de cajas de ahorros y fundaciones bancarias, se vuelve al antiguo modelo de cajas y se establecen límites a sus inversiones. La Ley señala, en el punto III del preámbulo: «En primer lugar, se ha propuesto una vuelta al modelo tradicional de cajas al realizarse una vinculación explícita de su actividad financiera con las necesidades de los clientes minoristas y de las pequeñas y medianas empresas, de manera que este tipo de entidades financieras focalicen sus funciones en aquellas capas de la sociedad que tienen más difícil acceso a otro tipo de entidades o servicios financieros. En línea con lo anterior, esta Ley introduce la exigencia de que las cajas de ahorros desarrollen sus actuaciones en el ámbito local y tengan un tamaño reducido. El marco fundamental de actuación de las cajas de ahorros debe ser fundamentalmente el de la comunidad autónoma donde se implante, sin que puedan desarrollar funciones a nivel nacional; y se impide de manera expresa que las cajas tengan un tamaño lo suficientemente grande como para que adquieran carácter sistémico». Este cambio legislativo, que de haberse realizado con anterioridad podría haber evitado el colapso de las cajas e ingentes pérdidas económicas y sociales, llega cuando solo quedan en España dos cajas de ahorros de ámbito regional.“(Congreso, 2019; Pg. 208, el subrayado es nuestro).

⁴ “El Gobierno crea un consejo para reforzar la vigilancia sobre el sistema financiero”.

El panorama tradicional de Cajas de Ahorro comenzó a cambiar con la aprobación del denominado Decreto Fuentes Quintana en 1977 (*REAL DECRETO 2290/1977, de 27 de agosto, por el que se regulan los órganos de gobierno y las funciones de las Cajas de Ahorros. (BOE 5-9-1977)*), tras la muerte de Franco.

Si bien se continuó actuando con un sistema de gobernanza preconstitucional para el nombramiento de consejeros, y como tal, determinado totalmente por el Ministerio de Economía, se abrió la puerta para que el funcionamiento de las Cajas se fuera asimilando a la operatoria de los Bancos en sus operaciones de activo y pasivo. Se inició de esta forma un boquete donde se iba a ir alterando la gestión autónoma de las Cajas y diferenciándose un sistema de gobernanza en el que se reforzaba el papel de la administración profesional de las Cajas a través de sus cuadros directivos de la mera representación social de sus consejeros.

Las Cajas comenzaron a mejorar su especialización a través de procesos internos en los que la estructura directiva fue acometiendo mejoras acordes con las nuevas responsabilidades que contrastaban con el mantenimiento de un sistema de representación social que venía a modificar y modernizar los modos tradicionales de la elección de los consejeros.

La motivación de estos cambios estaba justificada en aquellos momentos tanto por la coyuntura política emprendida en la transición, que exigía una mayor democratización de las estructuras de gobierno de las Cajas como por el proceso de liberalización económica que, curiosamente es el que en la actualidad se critica.⁵

La Exposición de motivos del Real Decreto Fuentes Quintana es muy explícita en la justificación de los cambios. Con respecto a la liberalización de la operatoria de las Cajas, se considera que:

“En cuanto a la operatoria de las Cajas de Ahorros, el presente Real Decreto, atendiendo al criterio de libertad que debe prevalecer en la organización del sistema financiero, suprime las limitaciones que hasta ahora se habían venido manteniendo, sin otra aparente justificación que un evidente deseo de tutela ante riesgos no distintos por su naturaleza a los que constituyen el ámbito obligado de toda Entidad crediticia. Alcanzado hoy por las Cajas de Ahorros un grado notable de desarrollo, parece llegado el momento de levantar las prohibiciones referidas para que sea cada Entidad la que libremente decida la especialización a que su vocación y capacidad de gestión le conducen, sin otras limitaciones que las generales de las restantes instituciones financieras privadas.”

Como se ve, las razones argumentadas en aquel momento fueron exactamente las mismas, pero en sentido contrario que las utilizadas en la Ley de Cajas de 2013. El proceso iniciado en 1977 a este respecto fue profundizando en estas cuestiones con distintas normativas que fueron equiparando las operativas de las cajas a las de los bancos, con la notable diferencia de la captación de capital que se trató de resolver con la regulación de las “cuotas participativas” que solamente tuvo una aplicación en la CAM en 2008, siendo aceptada por el “relato” de la crisis de las Cajas de Ahorro como un peldaño más de su fracaso, a pesar de haber recibido todas las bendiciones del Banco de España y de la CNMV.

Con respecto a la gobernanza de las Cajas de Ahorro, el esquema básico anticipado por el Decreto Fuentes Quintana, fue el aplicado con posterioridad por parte de la LORCA de 1985 con algunos cambios motivados principalmente por la nueva existencia de las CCAA a partir de 1980 amparadas en la distribución de competencias que hacía la Constitución Española y los distintos Estatutos de Autonomía.

El carácter de Fundaciones privadas y la importancia que habían adquirido en el sistema financiero planteaba la cuestión de quien tenía que gestionarlas efectivamente. En muchas ocasiones, los dirigentes de las cajas españolas, se veían en dificultades para explicar en el exterior nuestro sistema de gobernanza ya que, si no eran privadas estrictamente y no eran públicas, ¿a qué respondían sus estrategias? ¿quiénes eran los que decidían sobre los criterios que tenían que adoptar?⁶ Esto es un misterio que, a pesar del tiempo transcurrido de la crisis, todavía no ha sido claramente entendido: ¿Quién o quienes tomaron las decisiones de la expansión del crédito para aprovechar el boom inmobiliario? ¿Con qué finalidad?

⁵ “La profunda reforma que el sistema financiero español exige para alcanzar un adecuado funcionamiento de nuestra economía ha sido emprendida decididamente por el Gobierno dentro de un plan coherente de disposiciones de distinto rango, cuya finalidad última no es otra que la de dotar al referido sistema de altos grados de libertad en su operatoria y de representatividad en sus instituciones. En esta línea de actuación reformadora, las Cajas de Ahorros no podían quedar al margen, pues no en vano suponen hoy, por el volumen de los depósitos que administran, más de un tercio del sistema crediticio privado. Representatividad y libertad son, pues, los dos principios que intentan combinarse en la reforma y constituyen, en dosis diferentes, los criterios inspiradores de otras disposiciones que articulan modificaciones estructurales profundas en nuestro sistema financiero. También estos dos principios constituyen el fundamento básico del presente Real Decreto, cuyo contenido normativo se dirige a la modificación de los órganos de gobierno de las Cajas de Ahorros, de la operatoria de las mismas, de la asignación de sus excedentes Y, finalmente, de la organización y funciones de sus instituciones representativas a nivel nacional.”

“En el primero de los ámbitos indicados, la profunda transformación que ofrece la vida política y el ambiente social de nuestro país, al incorporar plenamente a sus estructuras y actividad los criterios pluralistas y democráticos que ha impuesto el ejercicio de la libertad individual y colectiva, aconsejan trasladar tales principios a los órganos de gobierno de las Cajas de Ahorros., instituciones que, por su finalidad y naturaleza, están directamente insertas en la propia comunidad que constituye la base de su desarrollo. Por ello, la modificación de la normativa por la que se regula la composición y funcionamiento de esos órganos de gobierno y administración ha de ofrecer el cauce adecuado y necesario para materializar de forma plena el principio de amplia representatividad que actualmente informa y preside las diferentes expresiones de la vida social española”. (Real Decreto 2290/1977. Exposición de motivos.)

En relación a esta cuestión, la Presidenta de la Comisión de las Cortes sobre la Crisis Financiera, en una entrevista en El País, a la pregunta sobre las cuestiones que no se habían abordado en esta Comisión, mencionaba que, “posiblemente tendrían que haber citado a los Directores de las Cajas de Ahorro” (El País de 15 de diciembre de 2018). En otras palabras, habían comparecido los Presidentes de las Cajas, con unos conocimientos en muchas ocasiones insuficientes sobre las operativas de las Cajas (la mayor parte sin competencias ejecutivas) y los que marcaban las estrategias a seguir por esas entidades, habían quedado fuera ¿Cómo ha sido posible conocer las razones del funcionamiento de las cajas en la crisis sin la versión de sus principales responsables?

El Decreto Fuentes Quintana marcó la pauta organizativa de las cajas a través del procedimiento para el nombramiento de Consejeros y compromisarios.

En su “Exposición de motivos” se argumentaba que, *“A tales efectos se arbitran en el presente Real Decreto los procedimientos necesarios para conseguir una extensa base de representación de la que surjan los miembros que integrarán los citados órganos de gobierno, articulándose la selección mediante amplios criterios objetivos que permitan excluir influencias o vinculaciones que pudieran condicionar, en alguna forma, el libre y racional desenvolvimiento de la gestión de las Cajas de Ahorros y la eficaz realización de sus objetivos.”* (el subrayado es nuestro).

En el Real Decreto quedó sentado el principio que, con posterioridad ha sido blanco de gran cantidad de críticas que, desde nuestro punto de vista, nunca han sido conscientes de sus implicaciones: el papel de los impositores y su selección para su entrada en los distintos órganos de representación de las cajas. Es más, en numerosas ocasiones se atribuyó al descenso de los porcentajes en representación de los impositores en las Asambleas y otros órganos de las cajas a un incremento de la politización de las mismas, al ser nombrados los otros consejeros que sustituían a los impositores por las instituciones de carácter político (Ayuntamientos, Diputaciones o Parlamentos o Gobiernos regionales).

El sistema de elección de los impositores tenía dos fases. En la primera se realizaba un sorteo ante notario entre todos los impositores de las cajas que cumplieran ciertos requisitos (lo que permitía descartar a un reducido número debido a incompatibilidades o situación financiera respecto a la propia caja)⁷. Estos impositores, denominados “compromisarios”, en una relación de entre 10 y 20 a uno, serían los encargados de designar a los consejeros que iban a entrar en la Asamblea de la Caja: ¿Era este un sistema racional, democrático y representativo para “incorporar plenamente a sus estructuras y actividad los criterios pluralistas y democráticos”, según lo citado en el Real Decreto?

Imaginemos que, en aquellos momentos de debate para la redacción de la Constitución Española que se aprobaría un año después, alguien hubiese sugerido que, para “incorporar plenamente a sus estructuras y actividad los criterios pluralistas y democráticos”, la elección de los compromisarios que tuviesen que elegir a los Diputados al Congreso se hiciese por sorteo. Aunque a estas alturas esos procesos de las cajas puedan parecer “increíbles”, han sido los que han estado vigentes hasta hace pocos años, con el beneplácito de todos nuestros representantes políticos que, visto lo ocurrido, han sido los primeros en criticar este sistema democrático “peculiar” buscando responsables ajenos a su propia responsabilidad.⁸

En muchas ocasiones, se ha criticado este sistema por que se sospechaba que era manipulable pero, ¿cómo iba a consentir un notario que se alteraran los términos de un sorteo para que salieran los nombres designados?

6 Un ejemplo puede ilustrarnos acerca de esta cuestión. Durante el proceso de búsqueda de salida a la crisis, una cuestión debatida y que estuvo durante un tiempo en los medios de comunicación en la Comunidad Valenciana fue la relativa a la fusión entre Bancaja y la CAM. Sin embargo, todos los analistas y el propio Banco de España desaconsejaron esa operación, no solamente por la coincidencia en los riesgos de crédito que ambas entidades tenían sino también porque la duplicidad de oficinas y los riesgos sobre el mismo territorio desaconsejaba la fusión por el alto coste de la supresión de empleos que tal fusión provocaría. ¿Cómo se había llegado a esa situación? Sin una orientación política financiera clara por parte de la Generalitat sobre cuales podían ser los escenarios futuros de una gran caja valenciana, los directivos de ambas cajas iniciaron una política expansiva en los territorios “dominados” por la otra caja con dos finalidades: en primer lugar, para que no se produjera una fusión y que un equipo directivo dominara, en segundo lugar para que, en caso de darse la fusión, ser los más grandes y, por lo tanto, los que marcaran las nuevas directrices. Resultado, hoy, tras los lamentos de los líderes políticos, ninguna existe.

7 *“ Artículo Segundo:.....Dos. La Asamblea General estará constituida; ... a) Por un mínimo de sesenta, y un máximo de ciento cincuenta Consejeros generales, elegidos mediante compromisarios en representación directa de los impositores de la Entidad. A tales efectos, la elección de compromisarios se efectuará mediante Sorteo público ante Notario entre los impositores de la Entidad que reúnan los requisitos que se establecen en el artículo tercero y en número no inferior a diez ni superior a veinte por cada Consejero general elegible.”* (El subrayado es nuestro, para resaltar el increíble proceso democrático que producía un sorteo).

8 Emilio Albi (Albi, 2016 y Albi, 2019) ha defendido la idoneidad del sorteo como forma de selección de los altos cargos en las instituciones del Estado español. El artículo está basado en un estudio realizado por el IEF y plantea algunas curiosidades sobre el ejercicio del poder en las sociedades democráticas, a mi parecer, vistas desde una óptica tecnocrática. El mérito y la capacidad para gobernar no tiene en cuenta otras cuestiones del poder que están muy presentes en las sociedades democráticas avanzadas. También se podrían plantear técnicas de gobierno a través de la inteligencia artificial (Ver Hariri, 2019). No obstante, existen propuestas sobre el gobierno por sorteo que se remontan al gobierno de los griegos a través de lo que se conoce como “demarquía”, pero no creemos que se pensara en estos procedimientos cuando se legisló sobre la elección de los impositores por sorteo para el gobierno de las cajas.

Ciertamente, la operatoria no era esta. Cada caja utilizó un procedimiento para la transformación del sorteo de compromisarios en consejeros de la Asamblea. En Serra (2011, pg. 89 y sig.) se describe también como se hacía este proceso, muy semejante a la que se describe a continuación.

El procedimiento era el siguiente: Se realizaba un sorteo limpio ante el notario con el listado de todos los impositores que reunían los requisitos mínimos (tengamos en cuenta que ese listado podía ser de millones de cuentas). Según el número de compromisarios a elegir se elegía un número y se marcaban los siguientes periódicamente hasta alcanzar el número total con sus correspondientes suplentes.⁹

Una vez elegidos, la Comisión Electoral (normalmente actuaba para este fin la Comisión de Control), asistida por los directivos de la Caja, pasaba a analizar las características de los elegidos (ya que debían ser seleccionados de entre ellos). Las probabilidades de que salieran personas con poca formación o con ningún interés por formar parte de los órganos de dirección de las cajas eran altísimas. ¿Y quiénes eran los encargados de conciliar este problema y llevarlo a buen puerto? Se utilizaban dos vías. La primera y más general a través de los directores de las oficinas donde el impositor tenía la cuenta. Este informaba a sus superiores acerca de las características del elegido en relación a su comportamiento con la caja e informaba de la posible idoneidad para asumir esa responsabilidad (esta vinculación se prolongaba durante todo el periodo en el que el consejero tuviera el nombramiento, incluso a través de acompañarlo a las Asambleas y mantenerlo informado de lo que aconteciera a la Caja). A través de este procedimiento, ante las situaciones conflictivas en las cajas siendo necesario votar, algunos acuñaron la expresión de que esos consejeros pertenecían al "Partido de la Caja". (Era un caso peculiar de cooptación).

El otro procedimiento consistía en pasar esa información a los partidos políticos para que vieran si entre los sorteados algunos pertenecían o eran afines a los mismos y, de esa forma, poderlos proponer para el cargo. Es cierto que alguna de estas situaciones se daba, pero en general, ante un proceso de sorteo limpio como el relatado, la aparición de militantes de Partidos Políticos era más bien escasa, pero muy importante para las fases sucesivas de nombramientos, especialmente en los Consejos de Administración y en la Comisión de Control.

Ante esta incertidumbre sobre las personas con posibilidades de presencia en los órganos de Gobierno, en algunas cajas se reservaban algunos puestos correspondientes a la representación de los impositores pero que fueran de libre designación por las mismas, para dar de esta forma entrada a determinadas personas que podríamos considerar como "consejeros independientes".

Con independencia de la bondad en la redacción de la norma, lo que es cierto es que ocho años después, en el debate para la aprobación de la LORCA, se denunciaba que esta no había sido suficiente para cambiar los antiguos procedimientos de designación de consejeros y de democratización de las Asambleas y Consejos de Administración. El Ministro Boyer, en la defensa de la Ley en 1985 ante las Cortes Generales enfatizaba los problemas: *"no puede ignorarse que en la elección en la representación de los impositores se han producido en el pasado irregularidades claras en los sorteos, desvirtuados éstos por todo tipo de prácticas opuestas a una representación territorial objetiva. ya fuera por el número de impositores o por el volumen de recursos de las distintas oficinas.*

En general, y aun cuando la renovación de los cargos ha sido importante tras los dos procesos electorales celebrados en los años 1978 y 1982, permanecen en los Consejos de Administración del orden de un 13 por ciento de consejeros nombrados con anterioridad al proceso electoral de 1978. Por añadidura, la renovación ha afectado de forma más decisiva a los distintos grupos representados. Así en el proceso electoral de 1982, los resultados correspondientes a las sesenta y seis Cajas de referencia arrojaron un 45 por ciento de nuevos consejeros, pero en el grupo de personalidades la renovación sólo afectó a un 13 por ciento. Puede, pues, con carácter general afirmarse que las irregularidades del sistema de sorteo viciaron la selección de impositores, de tal forma que el poder en las entidades no ha sufrido prácticamente desplazamiento alguno tras los dos procesos electorales celebrados" (DS Congreso de los Diputados, 16-4-1985)

Cuando se habla de la representación de los impositores y de personas no designadas por los partidos políticos, se está hablando del procedimiento anterior o de otros parecidos o incluso más dirigidos por las Asociaciones de impositores o consumidores (este sería el caso de Bancaja). Cuando se ha querido denigrar el sistema de dirección de las cajas por formar parte de él una bailarina, ha de tenerse en cuenta que eso era precisamente el espíritu del Decreto de Fuentes Quintana. y el posterior de la LORCA:: que cualquier persona tuviera oportunidad de ser consejero de la misma, aunque su formación poco tuviese que ver con lo que las cajas trataban.

Hay que reflexionar sobre las implicaciones del modelo de cajas a las que se quería llegar con la filosofía del Decreto Fuentes Quintana. ¿Cómo podía conciliarse la mayor liberalización en la operatoria de las Cajas y, por lo tanto, la mayor competencia entre ellas mismas y con los bancos, con unos consejeros que, en su amplia mayoría, eran legos en las materias financieras?

⁹ Estos procesos tuvieron lugar en un tiempo donde la preocupación por las cuestiones por la protección de datos no estaba muy desarrollada. No obstante, los directores de las cajas, en muchas ocasiones utilizaban ese argumento para ser ellos los únicos que podían acceder a toda la información. ¿Quién podía creerse que los compromisarios podían conocer quiénes de ellos eran los mejores candidatos para ser consejeros, cuando ignoraban toda la información referente a los demás?

La explicación sucinta también viene incorporada en el articulado del Decreto de 1977. Mientras que los requisitos exigidos para los consejeros e, incluso el Presidente son nulos (aparte de las incompatibilidades para ejercer ese cargo), la cosa cambia para nombrar al Director General de la Caja (a quien en ese momento se le otorgaba voz y voto en los órganos de gobierno¹⁰). Según el Artículo diecisiete del Decreto, *“El Director general o asimilado será designado por el Consejo de Administración de la Caja entre personas con capacidad, preparación técnica y experiencia suficiente para desarrollar las funciones propias de este cargo.”*

Su nombramiento se comunicará al Ministerio de Economía, que, en 'el plazo de dos meses, podrá ejercitar el derecho de veto por falta de idoneidad de la persona designada. En todo caso, la Asamblea General convocada al efecto habrá de confirmar previamente el nombramiento.” (el subrayado es nuestro).

En base a este criterio asociado también a la amplia gama de poderes que podía concentrar el Director General (la del nombramiento de toda la cúpula directiva, así como la estructura operativa de la Caja), no cabe ninguna duda que era en esta figura donde Fuentes Quintana situaba el verdadero poder de las Cajas de Ahorro.

La lucha real por el poder en las cajas de ahorro fue la del nombramiento del Director General. No solo por su persona, sino porque también iba a configurar el futuro de toda la cúpula directiva, en una especie de carrera endogámica de los candidatos para situarse en la mejor situación. El mercado de Directores Generales no puede decirse que, cuando existían las cajas, fuese muy competitivo. Tradicionalmente, los trabajadores de las cajas iban ascendiendo en el escalafón poco a poco hasta que lograban quedar en el disparadero para poder ser nombrados en la misma caja en la que habían hecho el ascenso. Pocos cambios de Directivos se daban entre estas instituciones y otras empresas (especialmente, bancos), por lo que la argumentación acerca de la “fuga de directivos” para justificar las retribuciones de los mismos, poco tenía que ver con la realidad.

3. LA GOBERNANZA DE LAS CAJAS DE AHORRO: LA LORCA DE 1985 Y SUS CONSECUENCIAS

Las elecciones de 1982 vinieron a dar un giro importante en multitud de asuntos sobre los que la sociedad española consideraba que era necesario cambiar. Entre estos estaban los de la representación social de las Cajas de Ahorro. En esta dinámica renovadora (que abarcó aspectos como los de la reforma universitaria, las nuevas leyes de educación, la nueva Ley de aguas, el denominado Decreto Boyer sobre la liberalización económica del comercio, etc.), también alcanzó a las Cajas de Ahorro.

Fue el Ministro de Economía, Miguel Boyer el encargado de llevar adelante el proceso. El Proyecto de Ley de Cajas no fue muy consensuado para su presentación, por lo que se presentaron tres enmiendas a la totalidad al mismo. Ciertamente, los 200 diputados que obtuvo el PSOE en esas elecciones no hacía temer que esas enmiendas prosperaran, pero quedaba claro que el asunto era polémico.

Boyer, en su defensa del Proyecto explicó las tres razones que lo justificaban: *“el proyecto de ley que el Gobierno presenta hoy a la consideración de SS. SS. tiene tres objetivos principales. En primer lugar, adecuar la normativa básica en materia de órganos rectores de las Cajas de Ahorro a las nuevas ordenaciones territoriales del Estado, ya que el Decreto de Fuentes Quintana es anterior a la Constitución. En segundo lugar, avanzar en la democratización de los órganos rectores, esto es, en una adecuación de la representación a los intereses que se quiere estén reflejados en la dirección de las Cajas. Y, en tercer lugar, y compatible con esta mayor democratización, con esta mayor transparencia en los procedimientos de designación, una mayor profesionalización de la dirección de la Caja”*. (DS. Congreso D. 16-4-85, pg. 9027).

La aprobación de la Constitución y los primeros Estatutos de Autonomía donde se asumían amplias competencias sobre las Cajas de Ahorro ya fueron un tema relevante en las relaciones entre el poder central y algunas CCAA que dio lugar a una sentencia del Tribunal Constitucional sobre la delimitación de competencias entre unas y otras en 1982. La cuestión debatida era: Si los Estatutos de Autonomía atribuyen competencia exclusiva a los gobiernos autonómicos sobre las cajas de ahorros, ¿Para qué hace falta una norma estatal sobre las mismas? Sin embargo, desde un punto de vista muy razonable, el Gobierno español consideró ya en aquella época, que no se podía desentender del funcionamiento de las cajas por el efecto que la mayor liberalización y operativa de las mismas tenía sobre la economía nacional. Este razonamiento, con el paso del tiempo fue perdiendo fuerza argumental ya que, en muchas ocasiones tanto desde el Ministerio de Economía como desde el Banco de España se ha culpado a los gobiernos autonómicos de no dejarles hacer las reformas que se precisaban para responder a la crisis. En absoluto esto fue verdad desde

¹⁰ No sólo esto, sino que el artículo 18 lo ponía con un poder esencial: *“El Director general o asimilado podrá suspender provisionalmente la ejecutividad de los acuerdos del Consejo de Administración de la Entidad que no se refieran a su persona, dando cuenta inmediata al Ministerio de Economía, cuando entienda que éstos vulneran las disposiciones vigentes o afectan injusta y gravemente a la situación patrimonial, a los resultados o al crédito de la Caja de Ahorros o de sus impositores o clientes”*. Realmente, no cabía mucha duda acerca de en quién se depositaba el poder de la Caja.

el punto de vista normativo. Si no se acometieron cambios en la década de 2000-2010 fue porque no se quisieron (o no se supieron) hacer. Como se puede ver a través de la Ley de Cajas de 2013 (sin haber habido cambios en la Constitución o en los Estatutos de Autonomía que afecten a esta cuestión), no resulta razonable mantener este criterio, aunque quien lo defienda pueda ser un Ministro de Economía o un Gobernador del Banco de España.

El segundo motivo explicitado por Boyer en la defensa de la Ley, tenía más que ver con la política cotidiana y su percepción social. El Decreto Fuentes Quintana había tratado de dar un barniz nuevo al viejo sistema de la elección de los cargos de Consejeros en las cajas. Como hemos comentado anteriormente, con un sistema mayoritario de impositores en las Asambleas y Consejo a través de sorteo, se consideraba que se había entrado en el proceso de democratización de las cajas. Pero como Boyer dice, a pesar de esos cambios, lo que se percibía a nivel social, es que eran las mismas personas y grupos sociales los que detentaban el poder en las mismas. Había que cambiar esa percepción.

El colectivo elegido para cambiar esa percepción fue, con cierta lógica, el de los Ayuntamientos, que, de tener una representación muy minoritaria en el modelo organizativo de Fuentes Quintana, pasaba a representar el 40% de las nuevas Asambleas y en el resto de los órganos de gobierno. La explicación estaba clara, y ha sido utilizada posteriormente para acusar a las cajas de politización: Como la actuación de las cajas¹¹ estaba vinculada al territorio, ¿qué mejor alternativa que tener a los representantes de ese territorio, los Ayuntamientos, en los órganos de gobierno?

Si bien esta solución rompía la imagen anterior de la Cajas, vinculada en la transición a la Dictadura de Franco a través de los nuevos representantes de unos Ayuntamientos gobernados por el PSOE, no puede decirse que estos cambios fueran determinantes en la evolución de las cajas.

En contraste con la selección de los impositores por sorteo, como se ha descrito anteriormente, la elección de los representantes de los Ayuntamientos, tenía otra dinámica muy distinta, aunque con unos resultados bastante parecidos: ¿A quiénes proponían los Ayuntamientos para consejeros?

Existió una gran variedad de realizar estos nombramientos. Nos limitamos a describir una de ellas que, a nuestro parecer puede ser representativa.

Un primer problema que se planteó fue el de saber a qué órgano del Ayuntamiento y con qué criterio se nombraba a su/sus representantes en relación a los partidos políticos presentes en la corporación. Fuera el Alcalde o fuera el Pleno el que efectuara el nombramiento, estaba claro que, por pura lógica, este era una cuestión en la que los criterios que primaban eran los políticos. Pero, ¿eso qué significa en este caso? Pues que gran parte de estas representaciones se hacían en la persona del alcalde o los concejales de la corporación que, evidentemente no tenían una preparación especial para tratar asuntos de la gestión de las cajas, aunque pudieran saber sobre las cuestiones del poder.

Evolución de los porcentajes de representación en los órganos de gobierno a partir de 1985

	Corporaciones Locales		Impositores		Entidades Fundadoras		Empleados		Diputaciones, Consejos o Cabildos Insulares		Cortes o Asambleas y Gobiernos regionales		Otras Entidades		
	Antes Ley 44/2002	Después Ley 44/2002	Antes Ley 44/2002	Después Ley 44/2002	Antes Ley 44/2002	Después Ley 44/2002	Antes Ley 44/2002	Después Ley 44/2002	Antes Ley 44/2002	Después Ley 44/2002	Antes Ley 44/2002	Después Ley 44/2002	Antes Ley 44/2002	Después Ley 44/2002	
a CCAA															
Andalucía	22	22	27	27	13	13	15	15	0	0	15	15	8	8	
Aragón	(42)21	21	(41)41	41	(10)10	10	(7)7	7	0	0	(-)21	21			
Asturias	40	27	20	40	35	23	5	10	0	0					
Baleares	34	34	39	39	16	16	5	5	6	6					
Canarias	44	44	26	26	10	10	5	5	10	10			5	5	
Cantabria	(38)23	23	(22)23	23	(10)8	8	(5)8	8	25(25)		0	(-)23	23	(-)8	15
Castilla-León	(25-40)32	32	(35-45)32	32	(10-15)5	5	(5-15)11	11	0	0	(-)15	15	(5-10)5	5	
Castilla La	40	22	22	30	10	8	7	9	0	0	21	19		12	

¹¹ En esta cuestión no se tuvo en cuenta la contradicción que se estaba abriendo con la liberalización de las cajas, ya que estas estaban pasando de ser meras receptoras del ahorro de los impositores y de financiadoras de la compra de viviendas a través de hipotecas a operadoras en los mercados financieros donde la cuestión del territorio iba a ser cada vez menos relevante. Cierto es que la cuestión de la obra social se mantuvo como un elemento local muy relevante, pero los consejeros en representación de los Ayuntamientos no por ello defendían la labor de la Caja en todos ellos. Estaba claro que la defensa se hacía en todo caso a favor de su propio municipio y del Ayuntamiento que lo había nombrado. Este comportamiento puede asimilarse al comportamiento de los concejales en las Diputaciones Provinciales.

Mancha														
Cataluña	15-25	15-25	30-40	30-40	25-35	25-35	(5-15)	(5-15)	0	0				
Extrema dura	40	40	44	25-50	11	11	5	(5-15)	0	0				
Galicia	15-25	15-25	30-40	30-40	25-35	25-35	(5-15)	(5-15)	0	0				
La Rioja	31	24	31	43	33	26	5	7	0	0				
Madrid	32	25	28	28	20	20	8	9	0	0	12	10		8
Murcia	40	25	20	40	35	25	5	10	0	0				
Navarra	40	40	44	44	11	11	5	5	0	0				
País Vasco	(-) ³²	30	(44)41	43	(51)22	20	(5)5	7	0	0				
Comuni dad Valencia na	(35)28	25	(35)28	33	(15)5	5	(15)11	12	0	0	(-) ²⁸	25		

Fuente: Cals, J. (2005), pg. 187

Es cierto que, en otras ocasiones, los nombramientos recaían sobre personas con mayores conocimientos, bien del propio municipio donde se designaba, bien a instancia de los dirigentes del partido político que podía designar cargos. Pero, evidentemente, no era la mayoría.

El efecto final de este proceso ¿cuál era? Pues una situación si no igual, muy parecida a la explicada para los impositores: los responsables en los órganos de gobierno de las cajas en representación de los Ayuntamientos no tenían conocimientos suficientes para dirigir las cajas, por lo que su papel era ciertamente subordinado a los directivos de las cajas, salvo en las cuestiones políticas más polémicas o los asuntos puntuales de la obra social¹².

Pero la visualización del cambio se hizo, con lo que se identificó paradójicamente dicho cambio con la progresiva pérdida de la operatoria tradicional de las cajas, a pesar de esa mayor presencia de representantes locales.

Los partidos políticos, especialmente los mayoritarios, PSOE y PP, que eran los que tenían mayores posibilidades para situar a sus representantes en los órganos de dirección de las Cajas, nunca tuvieron una preocupación especial por diseñar estrategias propias para sus representantes en las mismas. Se conocen pocos documentos en los que se reflejara qué defender en esos órganos, aparte de intentar colocar el mayor número de representantes.

Cuestión especial y significativa sería la relativa a la elección de los Presidentes de las Cajas donde sí existía una mayor intervención de los partidos políticos y los Gobiernos regionales. A pesar de que estos, en su mayoría, no tenían funciones ejecutivas, sí que desempeñaban un importante papel como intermediarios entre los directivos y las instituciones y los reguladores que, en buena medida, han sido significativas en la orientación y resolución de la crisis, bien por acción, bien por omisión (Cuñat, 2009).

Aparte de que cada Caja partía de una situación diferente y podía adoptar las estrategias que considerara más oportunas, la competencia con el resto hacía que no se supiera muy bien hasta qué punto estas tenían alguna justificación “profesional”. Por otro lado, la estructura de los Partidos políticos estaba territorializada, por lo que difícilmente se podía llegar a estrategias conjuntas más allá de unas bases muy generales de actuación. ¿Cómo se iba a seguir en Cataluña las directrices que marcaran los partidos para toda España cuando la nueva dinámica en España era la de potenciar a cada una de las autonomías? Y así, para el resto.

Cuando se discute acerca de la loca carrera emprendida por todas las Cajas de Ahorro para su expansión territorial, su apelación al crédito internacional y, especialmente por la utilización de la expansión inmobiliaria a partir de finales de los años 90, hay que señalar que ningún partido dio ninguna instrucción para frenar este proceso o, al menos, intentarlo a través del posicionamiento de sus consejeros afines¹³. En realidad, lo que se produjo fue lo contrario de lo que se ha venido utilizando para explicar la crisis. No fue la politización de las cajas lo que la impulsó si no precisamente la carencia de políticas adecuadas y prudentes para ser aplicadas por las mismas.

Los cambios políticos que se produjeron a partir de 1995 en muchas autonomías con la entrada del PP en los gobiernos de las CCAA, produjeron también cambios respecto a la composición de los órganos de

¹² Posiblemente, donde mayor importancia podían tener las influencias políticas eran las referentes a la Obra Social, pero también aquí, el papel de las estrategias de los profesionales de las cajas eran las predominantes ante los cambios que se experimentaban con los sucesivos procesos de renovación de consejeros.

¹³ En el Dictamen del Congreso de los Diputados (Congreso, 2019) no existe ninguna referencia a esta cuestión, aunque la “politización de las Cajas” ha quedado como parte de la cultura general.

gobierno de las cajas, buscando un mayor intervencionismo en los nombramientos de consejeros.

Un ejemplo destacado de este proceso fue el ocurrido en la Comunidad Valenciana que vino a seguir la estela marcada por la Comunidad de Madrid, pero ampliándola. En esta autonomía, inmediatamente se abrió una nueva representación de consejeros: los nombrados por las Cortes Valencianas (Ley Valenciana de Cajas de 1997). A través de este proceso, se disminuía la representación de los Ayuntamientos para dar entrada a los nombrados por las Cortes.¹⁴ Por esta vía, paradójicamente se volvía al tradicional sistema de los notables locales y regionales para configurar los órganos de las cajas, aunque en este caso nombrados por los poderes políticos democráticos. Si se hubiese pensado en el anterior sistema de cooptación, posiblemente se hubiese nombrado a las mismas personas o a otras muy parecidas¹⁵.

Desde el punto de vista de la profesionalización y a efectos prácticos, los resultados fueron parecidos a la entrada de los representantes de los Ayuntamientos, aunque la demostración de poder de los nuevos dirigentes del PP (Zaplana fue a estos efectos el ejecutor más destacado) supusiera una mayor beligerancia entre el Gobierno regional y el Director General y Presidentes de las Cajas.

Una empresa y, especialmente una empresa financiera, es casi imposible que pueda estar dirigida en sus actuaciones cotidianas por los procedimientos que entendemos como democráticos. La estructura de gobierno no puede estar sujeta a vaivenes y cambios de parecer continuos en la dirección de la misma. Por ello, el objetivo de democratización en las cajas no debería haberse entendido nunca como una especie trapicheo político cotidiano. Algunos de los denominados “analistas” (Medina, M. 2018), han venido a poner ejemplos de cómo un alcalde de pueblo que ocupaba un puesto de consejero en una caja, daba los créditos a los hipotecados. Las malas prácticas o las influencias (positivas y negativas), nunca han sido exclusivas de una empresa específica, pero no debería confundirse ese problema puntual con un sistema de gobernanza.¹⁶

Cuando en las Cortes generales se hablaba de profesionalización de las cajas, la referencia estaba dirigida precisamente a los Directores Generales o asimilados.

Como recordaba en el debate de la LORCA de 1985 el diputado de Minoría Catalana, Gasoliba, el contraste en la gestión de las cajas respecto a los bancos en la crisis financiera por la que se pasó estos a primeros de los años 80 en España, había mostrado su solidez¹⁷. Pero, al parecer, nuestro potente arranque en la recién inaugurada democracia no nos permitió ver las razones últimas de las crisis bancarias, ni los riesgos que conlleva este tipo de negocio y las necesidades permanentes de regulación y supervisión.

La Ley de 1985 continuó con el camino de no retorno iniciado con el Decreto Fuentes Quintana, como explicaba el Ministro Boyer: *“Como ulterior propósito, perfectamente compatible con la mayor democratización de los órganos rectores de las Cajas de Ahorro, está el objetivo de potenciar la profesionalización de las Cajas y hacer eficaz su gestión. Es necesario renovar la normativa poco a poco; y en un aspecto fundamental ya ha sido hecho en las leyes del coeficiente de caja y acaba de hacerse en la Ley de Coeficiente de Inversión, ya que se tiende a eliminar -y en el futuro desaparecerán- las especializaciones forzadas de las Cajas por imposición de coeficiente o de obligaciones legales, que está aproximándose cada vez más a la de los otros intermediarios financieros. y se abre paso a una especialización por vocación o por decisión de los órganos rectores de las Cajas en su propio ámbito. De manera que, adicionalmente, el deseo de profesionalización va a poder operar sobre una mayor libertad en las decisiones y en la operativa de las Cajas”*. (DS Congreso 16-4-1985 pg. 9029).

Los cambios que se estaban produciendo a través de estas leyes exigían un nuevo comportamiento empresarial de las cajas de ahorro que no estaban acostumbradas a tener que tomar decisiones muy arriesgadas. Los profesionales que colocaban sus excedentes de tesorería en cédulas del INI garantizados por el Estado o en el mercado interbancario con una cierta y baja rentabilidad y que limitaban sus

14 En un primer momento (Gobierno PP-UV con Zaplana), los nombramientos si bien trataban de incorporar a representantes sociales y vincular “proporcionalmente” con propuestas de los Partidos políticos, posteriormente, con una mayoría de Diputados del PP, fueron nombrados en su totalidad a propuesta de este partido

15 En los momentos actuales, con la separación del negocio financiero de las antiguas cajas y las Fundaciones bancarias y especiales procedentes de las mismas, nos encontramos con una vuelta a los anteriores sistemas de cooptación para el nombramiento de vocales en las Fundaciones. La Caixa es un buen exponente de la situación, pero las demás parece que han renunciado a los sorteos.

16 Los cambios propiciados por la entrada de personas nombradas por las Cortes y Parlamentos regionales y, especialmente el afán intervencionista de los gobiernos regionales, sí que provocaron enfrentamientos tanto en los nombramientos de Presidentes de Cajas como en algunas operaciones de crédito que los gobiernos regionales consideraban como preferentes. Estos pulsos entre los Directores Generales y los gobiernos regionales a través de los Presidentes de las cajas se dieron con resultados muy variados dependiendo de la personalidad y aguante de los Directores Generales.

17 “En cuanto a la profesionalización, les haré gracia de las opiniones, altamente favorables, vertidas en los últimos años por las autoridades monetarias y gubernamentales en diversas asambleas y reuniones de Cajas de Ahorro. Sin embargo, les invito a que examinen el comportamiento de las Cajas desde el inicio de la crisis económica en España y lo comparen con el de otras instituciones económicas, o bien que observen los resultados obtenidos por las Cajas en los últimos años y los comparen, asimismo, con los de otras instituciones financieras de cuyo grado de profesionalización nadie duda.” (DS Congreso 4-1985 Pg. 9044)

captaciones de pasivo a través de unas remuneraciones del ahorro que les venían fijadas¹⁸, poco iban a tener que ver con los nuevos directivos que captaban pasivos en los mercados internacionales, realizaban créditos sindicados, titulizaban créditos o diversificaban sus inversiones en multitud de empresas, adentrándose además en otros territorios sobre los que tenían una información muy limitada en cuanto a costumbres y a cultura de riesgos.

Si bien ese embate fue asumido en un primer momento por la inercia y valoración positiva de las cajas en la sociedad española además del esfuerzo de los Directores Generales y cúpulas directivas de las cajas, los cambios que se produjeron con nuestra entrada en la zona euro a partir de 1999, dejaron desorientados no solo a esos directivos, sino a toda la sociedad, con una especial responsabilidad del Ministerio de Economía y del Banco de España que no supieron analizar lo que estaba pasando a primeros del nuevo siglo. (Ekaizer, E. 2018).

La tradición y la cultura de las cajas, representada esencialmente en los Directores Generales, pero transmitida a través de todos los cargos de las cajas, desde los trabajadores en las oficinas centrales hasta los directores y trabajadores de las oficinas, era la del éxito. Unas organizaciones centenarias que habían pasado por tantas situaciones históricas y habían sobrevivido, daban la seguridad de una estabilidad a prueba de bombas. Pero lo que no sucede en cien años sucede en un día.

Como en todo fenómeno económico, los movimientos de la oferta y la demanda sin una adecuada previsión de los riesgos que siempre tiene el sistema financiero, marcaron la nueva situación de una forma tan rápida que no permitieron percibir conscientemente el riesgo de la nueva situación.

Ni se estaba preparado para recibir una gran liquidez a tan bajo precio (amplia financiación y disponibilidad de ahorro a bajos tipos de interés), ni se era conocedor de un negocio como el inmobiliario que había mutado de la sólida financiación de hipotecas para las familias a una disparatada vorágine hacia la especulación urbanística. Como diría Rato en una de sus frases más parafraseadas respondiendo al Diputado del PSOE Sr. Roldán:

“Usted dice que las cajas de ahorros le han costado al Erario español 60 000 millones de euros. Yo creo que la cifra es mayor, pero ¿usted sabe cuánto han perdido los accionistas privados de la banca española? No lo sabe. Han perdido 100 000 millones de euros en valoración de sus acciones más 70 000 millones de ampliaciones de capital. ¿Eso lo consideramos un saqueo? No, eso es el mercado, amigo. Las crisis cuestan mucho dinero.” (Congreso, 9 de enero de 2018 Pág. 20) (el subrayado es nuestro).

4. LA POSTGOBERNANZA DE LAS CAJAS DE AHORRO: EL CASO DE LA CAM

La afloración de la crisis financiera en España a partir de la mitad del año 2010 con la constatación de la misma por parte del Presidente del Gobierno (Rodríguez Zapatero, 2017), inicia un periodo en el que la tan discutida “gobernanza” de las Cajas de Ahorro cambia de naturaleza. A pesar de que el Real Decreto-Ley de Cajas de 2010 no supuso cambios inmediatos en el gobierno de las cajas, sus órganos de gobierno perdieron toda su autonomía en beneficio de una “monitorización” dirigida desde los despachos del Banco de España.

Con la puesta en marcha de los denominados SIP, el Banco de España comienza un proceso estratégico de cambios en las cajas de ahorro que supone situar a los órganos de gobierno de las cajas como meros seguidores de las directrices emanadas por el Banco de España. A través de este proceso se diseña todo un esquema de alianzas entre las mismas y diseño de sus estructuras donde se separa el negocio financiero de la obra social, lo que supone una convulsión en el sector. Los consejeros se enteran de lo que van a hacer por la prensa. Por ejemplo, el denominado Banco Base, donde estaban incluidas Caja Asturias, CAM, Caja Cantabria y Caja Extremadura no es fruto de una negociación voluntaria entre estas cajas, sino que era fruto del laboratorio del Banco de España. Los consejeros de estas cajas no tuvieron más que aceptar (no sin resistencia, eso es cierto) lo que venía impuesto por el Banco de España. Algún Presidente de Cajas ha contado como le mostraron en el Banco de España un amplio mapa donde, con chinchetas de color verde y rojo, le mostraban el resultado final de las reestructuraciones previstas.

Los Consejos de Administración de las cajas pasaron a ser meros comparsas de las decisiones del Banco de España sobre qué es lo que se tenía que hacer. No se admitía ni el más mínimo cambio. Ciertamente que eso no fue un proceso acabado. La propia intervención del Banco de España a través de un Informe de la situación de la CAM en diciembre de ese año fue el origen de la ruptura de este SIP (no explicado todavía por nadie) que llevó a que CAM se saliera del mismo en abril de 2011.

Es muy difícil atribuir responsabilidades debidas a la gobernanza de las cajas a partir de esos momentos. El

¹⁸ Es muy relevante señalar el desacople que estaba ocurriendo entre las explicaciones tradicionales acerca de la presencia de impositores en los órganos de gobierno de las cajas, derivado de su contribución a los pasivos de las mismas, con las nuevas realidades financieras donde los pasivos estaban formados mayoritariamente por el endeudamiento internacional. Hubiese sido interesante plantear el dilema para pedir que entraran los Bancos alemanes en los órganos de control de las cajas, ya que eran sus “nuevos impositores”. Los bancos del norte de Europa, expresa o tácitamente, confiaban más en la capacidad de presión de sus gobiernos para recuperar sus ahorros que pedir meterse en algo que no alcanzaban a entender del todo.

proceso de los SIP significaba romper con la estructura de gobernanza anterior ya que, la separación entre el negocio financiero, que pasaba a la cabecera del Banco del SIP, significó también cambios de forma abrupta en las cúpulas de las Cajas (el Director General de la CAM cesó en noviembre de 2010 y, a pesar de la ruptura del SIP del Banco Base en abril de 2011, nunca volvió a los Órganos de la CAM), consolidándose así lo que se podría denominar como de una caja “zombi”¹⁹, donde las decisiones que se tomaban fuera de la misma obligaban a esta a amplios vaivenes en la supuesta búsqueda de socios privados que permitieran una capitalización privada que nunca llegaría.

Un mazazo adicional fue el que supuso el Real Decreto-Ley 2/2011 que, cual “disparo al pie”, con unas exigencias de capital superiores en las cajas que en los bancos, suponía que los márgenes estrechos de los que se partía para reflotar a las cajas con problemas, se reducía aún más.

A pesar de estos problemas, de que la CAM era la única caja que había emitido cuotas participativas y de que a partir de abril de 2011 se había quedado sola ante la ruptura del SIP del Banco Base, el Banco de España, para sorpresa de propios y extraños, siguió siendo considerada “viable” a partir de la nueva legislación.

Si bien es cierto que no se intervino en ese momento, no lo es menos que los ataques a la misma por parte del Banco de España y los medios de comunicación se recrudecieron. La prensa de esas fechas recogía comentarios acerca de que, en el Banco de España se había abierto una sala dedicada a la CAM para seguir sus movimientos. Difícilmente se podía analizar la situación desde dentro de los propios órganos de gobierno.

En el periodo que va de abril de 2011 hasta la intervención por el Banco de España el 21 de julio de 2011, a pesar de la información favorable (dentro de las dificultades del momento) que evidenciaban los test de stress y de la búsqueda de mayores aportaciones del denominado FROB III, o de la entrada de capital privado, las posibilidades de alguna solución por parte de los órganos de gobierno que todavía funcionaban en la CAM se hizo inmanejable. Las prejubilaciones de buena parte del equipo directivo, incrementaba a su vez la percepción de una organización “zombi”²⁰

A partir de la intervención de la CAM en julio de 2011, esta siguió funcionando. Se pasó de la fase del “monitoreo” a la fase de la gestión por parte de los interventores del FROB hasta la venta al Banco de Sabadell en diciembre de ese año, aunque habría que esperar hasta mayo del año siguiente para que las autoridades europeas dieran en visto bueno a la compra.

¿A quién hay que atribuir la “gobernanza” de la CAM en este periodo? La intervención de la CAM se hizo el mismo día que el Consejo de Administración aprobaba la segregación de activos y pasivos que dio lugar a dos entidades que, posteriormente ha sido fuente de discusiones sobre las responsabilidades de cada una. Por un lado, se creaba el Banco CAM (entidad financiera) y por otro, la CAM (que poseía todas las acciones del banco y que era responsable de la obra social).

Esta fase es testigo de un nuevo modelo de “gobernanza” en las cajas de ahorro (antes ensayado en Caja Castilla la Mancha y Caja Sur): el Consejo de Administración en ambas entidades lo detentaban los administradores del FROB, mientras que seguía vigente la Asamblea de la CAM y la Comisión de Control, pero con unos poderes alterados. De hecho, la convocatoria de una Asamblea de la CAM en septiembre de 2011 para tratar la cuestión de las cuotas participativas, fue anulada por los nuevos administradores del FROB.

La cuestión de las cuotas participativas constituyó y constituye, ya que todavía a fecha de hoy (abril de 2019) figura con la cotización suspendida en la CNMV, un elemento clave para intentar entender las distorsiones que originó todo este proceso.

La CAM fue la única caja de ahorros que emitió cuotas participativas, por lo que toda la legislación relativa a esta cuestión estaba dirigida solamente a ella. No puede decirse que la normativa fuese muy clara a este respecto, por lo que, cuando se realizó la segregación del negocio entre Banco CAM y CAM en julio de 2011, asesorados por expertos conocedores de esta cuestión (el Catedrático de Derecho Mercantil Cándido Paz Ares), y ante la imposibilidad de que un banco tuviese cuotas participativas, se creó la figura de la “deuda espejo” por la que el banco asumía una deuda con la CAM para permitir su amortización. Esta operación fue aceptada por el notario que inscribió la segregación entre las dos entidades (el notario Paz Ares, hermano del anterior), pudiéndose inscribir la operación en el Registro Mercantil. Los litigios posteriores sobre de quién era la responsabilidad de la amortización y el valor de las cuotas participativas nunca ha considerado que dicho acuerdo tuviese mucho valor, pero aún así, el mismo ha impedido que se haya cerrado este asunto hasta ahora ya que, la cotización de las cuotas participativas de la CAM, siguen figurando en la CNMV con su cotización suspendida, no sabiendo sus poseedores cuál es su situación a este respecto.

Pero las cuotas participativas también han significado un hecho extraño sobre la operación de venta del

¹⁹ 31-3-2011 Cinco Días “La AEB teme que las ayudas públicas generen cajas zombis”

²⁰ Expansión. “JC Flowers y otros inversores pujarán por CAM sólo si la sana antes el Frob” 28.06.2011 Jaime E. Navarro

Banco CAM. Estas continuaron cotizándose en los mercados de valores, manteniendo su valor de cotización (alrededor de 4 €) hasta que los nuevos administradores del FROB reformularon las cuentas de la CAM a finales de agosto de 2011, momento en el cual su valor descendió hasta situarse, en el momento de la venta del Banco CAM al Banco de Sabadell en un valor de 1,34 €. Ciertamente, la preocupación de los administradores del FROB no fue la del mantenimiento del valor, por lo que puede entenderse que la flotación del mismo en el mercado y su cotización, respondía a la percepción del mismo sobre cuál era el valor de las cuotas sin ningún apoyo público o de la propia entidad. Pero ¿cómo era posible esta situación si desde el propio Banco de España se estaba diciendo públicamente que el valor de la CAM (del Banco CAM) era cero?

Al respecto de la “gobernanza” de esta caja, también nos encontramos con una situación peculiar. La intervención por parte del Banco de España a partir de julio de 2011²¹, hizo que entraran como administradores los tres interventores nombrados por el FROB. Pero debido a que se había segregado el negocio financiero de la obra social y la propiedad de las acciones del Banco, los Administradores se encontraron con que debían gestionar dos entidades no exentas de contradicciones. Por un lado, el negocio financiero que presentaba importantes problemas sobre sus cuentas y que estos las trataron a través de la reformulación de las mismas, pero por otro, debían gestionar también, y defender su patrimonio, a la Obra Social y a sus intereses como propietaria del 100% de las acciones en el Banco CAM. Aceptar sin ningún género de dudas que el valor de esa participación era cero, no parece que fuera la mejor forma de defender los intereses de la entidad que regentaban.

Esta paradoja entre la valoración del mercado y la valoración que le atribuía el Banco de España no dejó de llamar la atención a los medios de comunicación.²² Como se recogía en la noticia,

“Con esa escueta información, la primera pregunta que surge es de qué son titulares los titulares de cuotas de la CAM. ¿Son dueños de una pequeña parte de los derechos económicos de los elementos afectos a la obra social y de la oficina en Miami? ¿Qué derechos son esos? ¿Qué elementos son esos? ¿Cuánto valen? La información en los registros de la Comisión Nacional del Mercado de Valores brilla por su ausencia, pero la impresión inicial es que eso no vale nada o casi nada desde el punto de vista de un inversor. Sin embargo, las cuotas participativas, que representan un 5% de los derechos económicos de la vaciada caja, valen en Bolsa 73,5 millones de euros, lo que daría al 100% de esos derechos un valor de 1.500 millones. Es decir, el mercado está diciendo que la CAM vaciada, la CAM sin CAM, vale 1.500 millones”.



Fuente: CNMV

¿Cómo era posible que se aceptara un valor cero por el 100% del Banco CAM cuando el mercado venía a decir que tenía un valor de 1.500 millones de €? Con independencia de que fuera más o menos así, lo que

²¹ La entrada del Banco de España en la CAM para julio de 2011, había sido manejada en varias ocasiones por la prensa, lo cual había desestabilizado todavía más a la CAM de cara a la captación de depósitos y a su valoración. Por otro lado, esa intervención se hizo coincidir con la salida a bolsa de Bankia y vino a coincidir con la dimisión de Camps como Presidente de la Generalitat.

²² “¿Por qué nos hundieron en Bolsa las cuotas de la CAM? La entidad tiene un agujero de más de 5.000 millones Banco CAM será vendido por un euro, pero sus cuotas valen en Bolsa 73,5 millones y se disparan de modo inexplicable” El País 8-12-2011

quedó claro es que el gobierno de la caja no realizó ninguna acción para aclarar esta cuestión. Es más, se dieron por buenas las valoraciones que se hicieron por parte de las empresas contratadas por el Banco de España y se lanzaba la orden de que se amortizaran las cuotas participativas a valor cero, cosa que, a fecha de hoy nadie a hecho.

Recientemente han aparecido nuevas aportaciones sobre esta cuestión referida al valor de CAM (Ekaizer, 2018), poniendo en cuestión los datos que se tuvieron en cuenta para hacer la venta al Banco de Sabadell y la posible infravaloración del Banco CAM en aquellos momentos²³.

Ciertamente, la “gobernanza” de la CAM no fue buena antes de la crisis, pero lo que estas operaciones ponen en evidencia es que la “postgobernanza” introducida por los interventores del FROB tampoco contribuyó a una gestión adecuada en defensa de los intereses de la Caja.

En aquellos momentos, con la, posteriormente considerada fallida de Bankia a Bolsa, se consideró que con la resolución del “asunto CAM” a primeros de diciembre de 2011, se daban por finiquitadas las operaciones sobre las cajas ya que, según opinión del Gobernador del Banco de España “la CAM era lo peor de lo peor”.

Aunque con posterioridad se ha visto que los problemas eran todavía mayores (Congreso, 2019), el Gobierno y el Banco de España consideraron que se podía realizar la venta del Banco CAM sin afectar al déficit público, una de las principales preocupaciones del momento. Para ello se llevó a cabo la reordenación del Fondo de Garantía de Depósitos, unificándose en referido a los bancos con el de las cajas de ahorros a través del *Real Decreto-ley 16/2011, de 14 de octubre, por el que se crea el Fondo de Garantía de Depósitos de Entidades de Crédito*. (BOE de 15-10-2011), pero como se habían quedado cortos con respecto a las necesidades del mismo para la operación de venta que habían cerrado con el Banco de Sabadell (¡lo que hacen las prisas!), tuvieron que modificar el mismo a través del *Real Decreto-ley 19/2011, de 2 de diciembre, por el que se modifica el Real Decreto-ley 16/2011, de 14 de octubre, por el que se crea el Fondo de Garantía de Depósitos de Entidades de Crédito* (BOE 3-12-2011). Desde el punto de vista del Banco de España y del Gobierno, al considerar que el FGD era de naturaleza privada, podía así no ser computado como déficit público.

5. CONCLUSIONES. UNA INTERPRETACIÓN DEL PAPEL DE LA GOBERNANZA EN LA EXPLICACIÓN FINAL DEL HUNDIMIENTO DE LAS CAJAS DE AHORRO

1. Las cajas de ahorro, hasta en Decreto de Fuentes Quintana habían estado funcionando razonablemente bien. (Llamar la atención de cómo se habían estado tapando entre ellas las vergüenzas a través de fusiones e integraciones de las más ineficientes por las más potentes. En el caso de la CAM, el Decreto vino a coincidir con la gran fusión del 77 y pasar del Sureste a la de Alicante y Murcia))

2. El teórico buen funcionamiento residía en una gran regulación de las operaciones de activo y pasivo y en una regulación y supervisión permanente.

3. Las cajas de ahorro se ganaron un gran prestigio entre la población al promocionar el ahorro de la población y desarrollar con sus excedentes (una parte de los beneficios) una importante labor social, especialmente en los ámbitos asistenciales, educativos y culturales.

4. El largo periodo del Gobierno de Franco hizo que se vieran los órganos de gestión de las cajas como una reminiscencia de la Dictadura, por lo que, primero en 1977 y después en 1985, se cambiaran los sistemas de nombramiento de consejeros y se tratara de dar una imagen más democrática del gobierno de estas instituciones.

5. Las cajas de ahorro eran fundaciones privadas sin ánimo de lucro, por lo que eran sus Estatutos los que determinaban sus formas de gestión. Pero el Estado siempre consideró que debía controlar a las mismas debido al importante papel que tenían en la financiación de la economía y en el fomento del ahorro.

6. Los cambios que se inician en 1977 no solo afectaron a los órganos rectores de estas entidades si no, lo que al final ha sido lo más importante, también a toda la operatoria de las cajas respecto a sus activos y pasivos y a las posibilidades de expansión fuera de sus zonas tradicionales de desarrollo.

7. Asumir la operatoria y abandonar la cómoda situación anterior llevaba riesgos y nadie quiso asumir que esos riesgos en algún momento podían materializarse, como así ha sido.

8. El mayor riesgo fue posiblemente el desacople entre la nueva situación y la estructura de la gobernanza en las cajas. Los directivos se tenían que transformar de meros contables de los dictados de la “superioridad” y de los depósitos de los impositores a gestores de una actividad de mucho riesgo, sin una cultura donde se tuvieran en cuenta estas amenazas (¿cómo podía pensar un trabajador de la caja que su entidad pudiese entrar en quiebra? Eso solo ocurría en los bancos)

9. Las retribuciones en las cajas de ahorro, aunque siempre fueron superiores a las de los bancos, no por ello eran ajenas a los posibles incentivos adicionales que pudieran obtenerse a través de la expansión

²³ La cuestión de las valoraciones de las cajas y las operaciones que hizo el Banco de España ha sido puesta en cuestión por varios autores. (Muñoz Machado, S., 2011)

de las operaciones, especialmente las de activo.

10. Las directrices para la expansión de las cajas fue una dinámica interna retroalimentada por la propia competencia entre las entidades financieras (cajas y bancos) y por el impulso de sus directivos a los diferentes niveles de las entidades, a través de incentivos, para expandir todas las actividades.

11. La “politización” de las cajas está referida, principalmente, al nombramiento de miembros de las mismas en los Órganos de gobierno de las cajas, pero no esencialmente a la operatoria de las mismas que, en su mayor parte correspondió a los Directivos.

12. Los partidos políticos nunca tuvieron estrategias claras de lo que tenían que hacer las cajas de ahorros. No existen documentos orientativos de los mismos a las personas designadas en los órganos de las cajas sobre lo que deberían impulsar en las operativas cotidianas de las mismas.

13. La mayor intervención política estuvo vinculada a los nombramientos de los Presidentes de las mismas que, aunque no tenían funciones ejecutivas en su mayoría, sí que tenían una influencia decisiva en la orientación de las entidades (en unas para bien y en otras para mal).

14. El Banco de España nunca tuvo una consideración especial a las cajas de ahorro, a pesar de que estas tenían características diferenciales con otras entidades financieras, especialmente las referidas a la captación de capital. La puesta en marcha de las cuotas participativas fue un fracaso ya que únicamente se pusieron en marcha en una caja.

15. Los problemas de gobernanza nunca fueron puestos en cuestión antes de la crisis. Las reformas emprendidas en 2003 no supusieron cambios significativos en materia de gobernanza.

16. Los cambios introducidos a partir de 2010 con los Sistemas Institucionales de Protección (SIP) dirigidos por el Banco de España y el FROB supusieron un cambio radical en la gobernanza, quedando los órganos de las cajas supeditados a las directrices del Banco de España, sin apenas márgenes de maniobra.

17. Las medidas asociadas a los SIP fueron muy tardías para afrontar los problemas del sector ya que las operaciones que estaban ampliando la crisis se habían estado produciendo con mucha antelación (financiación inmobiliaria y refinanciación de las operaciones)

18. La intervención del Banco de España y el FROB en la gobernanza de las cajas a partir de aquellos momentos originó la existencia de unas entidades “zombies” en las que convivían los restos de los Órganos de gobierno nombrados con anterioridad y las nuevas direcciones nombradas por el FROB o dirigidas por el Banco de España.

19. La responsabilidad sobre las actuaciones de las cajas a partir de esos momentos, con importantes decisiones acerca de las valoraciones de los activos y las ventas de entidades, en ningún caso responden a los órganos electos de las cajas si no que deben ser atribuidos a los nuevos gestores del FROB y del Banco de España.

REFERENCIAS

- ALBI, E. (2016): *Cargos por azar*. Una vía sólida para evitar la politización de los nombramientos en altos órganos del Estado es la aleatoriedad. El País 22-3-2016
https://elpais.com/elpais/2016/03/21/opinion/1458559114_711907.html (consultado el 2-3-2019)
- ALBI, E. (2019): *La elección de altos cargos*. Con la designación de personas afines, la política persigue intereses de partido en lugar del bien común. El País 15-2-2019
https://elpais.com/economia/2019/02/12/actualidad/1549996397_595719.html (consultado el 2-3-2019)
- ARAGÓN, S. (2014): El papel del Corporate Governance tras la crisis de las Cajas de Ahorro. Dentro de COLINO, J. L. y GONZÁLEZ, J.C. (Eds). 2014): *Las cajas de Ahorros y la prevención y tratamiento de la crisis de las entidades de crédito*. Comares. Granada.
- ARANCIBIA, S. (1998): *El dinero de la discordia. Las cajas de ahorro, entre la privatización y el control político*. Temas de Hoy
- BALLARIN, E.(1985): *Estrategias competitivas para la banca*. Prólogo de Rafael Termes. Ariel. Barcelona
- BANCO DE ESPAÑA (2017): *INFORME SOBRE LA CRISIS FINANCIERA Y BANCARIA EN ESPAÑA, 2008-2014*, Mayo de 2017
- CALS, J. (2005): *El éxito de las Cajas de Ahorro*. Ariel.
- COLINO, J. L. y GONZÁLEZ, J.C. (Eds). 2014): *Las cajas de Ahorros y la prevención y tratamiento de la crisis de las entidades de crédito*. Comares. Granada.
- CONGRESO DE LOS DIPUTADOS. COMISIÓN DE ECONOMIA, COMERCIO Y HACIENDA (1985): *Dictamen del proyecto de Ley reguladora de las normas básicas sobre órganos rectores de Cajas de Ahorros*. Diario de Sesiones 7 y 8-5-1985
- CONGRESO DE LOS DIPUTADOS. CORTES GENERALES (1985): *Enmiendas de totalidad a iniciativas legislativas: Proyecto de ley reguladora de las normas básicas de los órganos rectores de las Cajas de Ahorro*. Diario de Sesiones 16-4-1985

CONGRESO DE LOS DIPUTADOS. CORTES GENERALES (1985): Dictámenes de Comisión sobre Iniciativas legislativas: Proyecto de ley reguladora de las normas básicas de los órganos rectores de las Cajas de Ahorro, de la Comisión de Economía, Comercio y Hacienda (-Boletín Oficial de las Cortes Generales*, número 129-1, Serie A, de 17 de enero de 1985). Diario de Sesiones 23-5-1985

CONGRESO DE LOS DIPUTADOS (2019): Comisión de Investigación sobre la crisis financiera de España y el programa de asistencia financiera. Dictamen de la Comisión. BOCG 17-1-2019

CONGRESO DE LOS DIPUTADOS (2017-2018): Comisión de Investigación sobre la crisis financiera de España y el programa de asistencia financiera. Diario de Sesiones 2017-2018. Comparecencias

CUÑAT, V. and GARICANO, L. (2009): Did Good Cajas Extend Bad Loans? The Role of Governance and Human Capital in Cajas. *Portfolio Decisions. London School of Economics and Political Science and CEPR*. October 19, 2009

CUÑAT, V. y GARICANO, L.(2010): ¿Concedieron las Cajas “buenas” créditos “malos”? Gobierno corporativo, capital humano y carteras de créditos. Dentro de FEDEA (2010) : La crisis de la economía española. Análisis económico de la gran recesión. <http://crisis09.fedea.net/crisis.php>

DE JUAN, A. (1984): El Banco de España y la supervisión del Sistema Bancario. En *Papeles de Economía Española* nº 18, 1984

DE JUAN, A. (2017): De buenos banqueros a malos banqueros. Marcial Pons

EKAIZER, E. (2018): *El Libro Negro. Cómo falló el Banco de España a los ciudadanos*. Espasa

EL PAÍS (2019): *Para prevenir la crisis. La Autoridad Macprudencial alertará sobre el riesgo de crisis y fijará la responsabilidad de los reguladores*. Editorial. 2-3-2019

FERNÁNDEZ, F. (2010): Todo es posible, nada es seguro en las cajas. *Papeles Faes*. 26/7/2010, nº 142

FERNÁNDEZ, F. (2011): Cajas de Ahorros: “Too Little, too late”. *Especial Papeles Faes* 9/3/2011, nº 154

HARIRI, Y. N., (2018): 21 lecciones para el siglo XXI. Debate

LEY 13/1985, de 25 de mayo. de coeficientes de inversión, recursos propios y obligaciones de información de los intermediarios financieros. (BOE 28-5-1985)

LEY 26/2013, de 27 de diciembre, de cajas de ahorros y fundaciones bancarias (BOE 28-12-2013)

LEY 31/1985, de 2 de agosto. de Regulación de las Normas Básicas sobre Órganos Rectores de las Cajas de Ahorro. (LORCA) (BOE 9-8-1985)

LEY 26/2013, de 27 de diciembre, de cajas de ahorros y fundaciones bancarias (BOE 28-12-2013)

LOSADA, R.(2018): ¿Y si eligiéramos a los políticos al azar? 19-9-2018. <https://blogs.publico.es/otrasmiradas/15348/y-si-eligieramos-a-los-politicos-al-azar/> (consultado el 2-3-2019)

MEDINA, M. (2018): Se vende banco por 1 €. Un análisis sencillo y certero de la crisis bancaria en España. Plaza y Janés. Barcelona.

MUÑOZ MACHADO, s. (2011): Regulaciones económicas y despojos patrimoniales (sobre los límites de la intervención de entidades de crédito por el Banco de España: el ejemplo de las Cajas de Ahorro). : [El Cronista del Estado Social y Democrático de Derecho](#), ISSN 1889-0016, N.º. 19, 2011, págs. 66-82

OLAVARRIETA, J.A. (2011): “Olavarrieta (CECA) denuncia que las cajas de ahorros están sufriendo una "campaña de desprestigio" en los medios". 17 Feb. (EUROPA PRESS) -<https://www.europapress.es/comunitat-valenciana/noticia-olavarrieta-ceca-denuncia-cajas-ahorros-estan-sufriendo-campana-desprestigio-medios-20110217185429.html> (Consultado el 8-3-2019)

QUINTÁS, J.R. (2018) Cajas de Ahorros españolas: Crónica de una muerte súbita. Racef. https://racef.es/archivos/galeria/cajas_de_ahorros_espanolas._cronica_de_una_muerte_subita_v1-1.pdf (consultado el 7-3-2019)

REAL DECRETO 2290/1977, de 27 de agosto, por el que se regulan los órganos de gobierno y las funciones de las Cajas de Ahorro. (BOE 5-9-1977)

REAL DECRETO-LEY 11/2010, de 9 de julio, de órganos de gobierno y otros aspectos del régimen jurídico de las Cajas de Ahorro. (BOE 13-7-2010)

REAL DECRETO-LEY 16/2011, de 14 de octubre, por el que se crea el Fondo de Garantía de Depósitos de Entidades de Crédito. (BOE de 15-10-2011)

REAL DECRETO-LEY 19/2011, de 2 de diciembre, por el que se modifica el Real Decreto-ley 16/2011, de 14 de octubre, por el que se crea el Fondo de Garantía de Depósitos de Entidades de Crédito. (BOE de 3-12-2011)

REAL DECRETO 102/2019, de 1 de marzo, por el que se crea la Autoridad Macprudencial Consejo de Estabilidad Financiera, se establece su régimen jurídico y se desarrollan determinados aspectos relativos a las herramientas macprudenciales.(BOE 2-3-2019)

RODRÍGUEZ ZAPATERO, J.L. (2017):Memorias.

SÁNCHEZ-CALERO, J. (2014): La crisis de las Cajas y la respuesta legislativa. Dentro de COLINO, J. L. y GONZÁLEZ, J.C. (Eds). 2014): Las cajas de Ahorro y la prevención y tratamiento de la crisis de las entidades de crédito. Comares. Granada.

SEBASTIÁN, M. (2014): *La falsa bonanza. Cómo hemos llegado hasta aquí y cómo intentar que no se repita*. Península.

SERRA RAMONEDA, A. (2011): *Los errores de las Cajas. Adiós al modelo de las cajas de ahorro*. Ediciones Invisibles. Barcelona

SEVILLA, M., PARDO, G., y TORREGROSA, T. (2011): La reforma de las Cajas de Ahorro y la cuestión del crédito a la economía española. ASEPELT. Delta. Anales de Economía Aplicada. 2011

SEVILLA, M., TORREGROSA, T. (2014): El papel del Banco de España en el hundimiento de las Cajas de Ahorro españolas. (Pg.307-332). ASEPELT. Delta. Anales de Economía Aplicada. 2014

SEVILLA, M., TORREGROSA, T. y NUÑEZ, M. (2015): La contribución de los Bancos Centrales de los países de la zona euro a la crisis financiera: El papel del Banco de España y su Servicio de Estudios. Sobre el Servicio de Estudios del Banco de España. Delta. Anales de Economía Aplicada. 2015

SEVILLA, M., TORREGROSA, T. y NUÑEZ, M. (2017): La información financiera y bancaria oficial y la última crisis económica (1999-2012). El caso del Banco de España. Estudios de Economía Aplicada. VOLUMEN 35-3: Agosto 2017

VALLE, V. (2008): La crisis financiera y las cajas de ahorro. El País 2-11-2008

VALLES, J. M. (2011): *Cajas, ¿la desamortización del siglo XXI?* El País 26 ENE 2011 https://elpais.com/diario/2011/01/26/opinion/1295996405_850215.html (Consultado el 7-3-2019)

VEGARA, D. (2006): Funciones y objetivos del Comité de Estabilidad Financiera (CESFI) Banco de España. ESTABILIDAD FINANCIERA NOVIEMBRE 2006 Numero 11

EMPLEO, PARTICIPACIÓN SOCIAL Y CALIDAD DE VIDA DE LAS MUJERES EN ESPAÑA Y EUROPA: EVOLUCIÓN EN 2008-2018

EVA AGUAYO LORENZO

Facultad de CC. Económicas y Empresariales/Departamento de Economía Cuantitativa/Universidade de Santiago de Compostela/Avda. Xoan XXIII s/n. 15782 Santiago de Compostela/eva.aguayo@usc.es

MARÍA-CARMEN GUISÁN SEIJAS

Facultad de CC. Económicas y Empresariales/Departamento de Economía Cuantitativa/Universidade de Santiago de Compostela/Avda. Xoan XXIII s/n. 15782 Santiago de Compostela/mcarmen.guisan@usc.es

e-mail Eva Aguayo Lorenzo: eva.aguayo@usc.es

Resumen

Este estudio es una continuación de estudios previos de las autoras respecto al análisis del empleo, la participación social y la calidad de vida desde una perspectiva de género. Ampliamos el análisis al período 2008-2018. El objetivo principal es observar si la crisis económica supuso un deterioro de dichas variables bien a nivel general de toda la población, bien de forma específica sobre las mujeres. Realizamos una selección de datos estadísticos y analizamos la evolución en España en comparación con Alemania, Francia, Italia, Reino Unido y otros países. Encontramos que la crisis ha implicado estancamiento o retroceso en la calidad de vida laboral y el desarrollo económico y social de varios países. Se analizan las diferencias entre países, así como las principales relaciones de causalidad y se destacan las oportunidades pérdidas como consecuencia de varios errores de las políticas anti-crisis tanto en España como en la Unión Europea. También se destaca la conveniencia de promover un mayor dinamismo en la sociedad y en los medios de comunicación, tanto en España como en la UE, para impulsar políticas económicas realistas que fomenten el empleo y la calidad de vida.

Palabras clave: Empleo, Calidad de Vida, Mujeres, España, Políticas anti-crisis en Europa.

Abstract

This study is a continuation of previous studies by the authors regarding the analysis of employment, social participation and quality of life from a gender perspective in Europe. We extended the analysis to the period 2008-2018. The main aim is to observe if the economic crisis implied a deterioration of these variables either at the general level of the whole population, or specifically about women. We make a selection of statistical data and analyze the evolution in Spain compared to Germany, France, Italy, the United Kingdom and other countries. We find that the crisis has implied stagnation or regression in the quality of working life and the economic and social development of several countries. The differences between countries are analyzed, as well as the main causal relationships and the lost opportunities are highlighted as a consequence of several errors of the anti-crisis policies in

Spain and in the European Union. It also highlights the desirability of promoting greater dynamism in society and in the media, both in Spain and in the EU, to foster realistic economic policies that boost employment and quality of life.

Key Words: Employment, Quality of Life, Women, Spain, Anti-Crisis Policies in Europe.

Eje Temático 1 : Economía Internacional

1. INTRODUCCIÓN

En Guisán y Aguayo (2011) y Guisán, Aguayo y Expósito (2012 y 2018) analizamos varios aspectos de interés en relación con el empleo y la calidad de vida desde una perspectiva de género en el período 1970-2010, como los siguientes:

- a) Participación social de las mujeres en el año 2010: toma de decisiones y medios de comunicación.
- b) Participación laboral de las mujeres en España y en Europa: sectores, salarios y dedicación horaria en el período 1970-2008.
- c) Relación entre salarios, productividad y producción sectorial en Europa, y análisis del Valor Añadido real según enfoque producción y enfoque renta.
- d) Deslocalización industrial: En el capítulo 4 del segundo de dichos estudios se dedica una atención especial a los desequilibrios de la política de comercio exterior de la Unión Europea, que tanto impacto negativo han tenido sobre la renta, el salario, el empleo y las oportunidades laborales para las mujeres.
- e) Educación, calidad del gobierno, igualdad de género y calidad de vida en Europa.

En este trabajo presentamos un análisis de la evolución en el período 2008-2018 en España, en comparación con otros países desarrollados. La sección 2 analiza la evolución del empleo, la brecha salarial de género y las condiciones laborales de las mujeres en el período 2008-2018. La sección 3 analiza las oportunidades de liderazgo femenino en instituciones políticas, sociales y empresariales. La sección 4 se dedica al tema de la visibilidad de las mujeres y medios de comunicación. Finalmente, la sección 5 presenta una síntesis de las conclusiones.

2. EVOLUCIÓN DEL EMPLEO, SALARIO, BRECHA SALARIAL Y CONDICIONES LABORALES DE LAS MUJERES EN 2008-2018

En las últimas décadas hemos asistido al crecimiento constante de la participación de la mujer en el mercado de trabajo. Este fenómeno ha acaparado la atención de numerosos estudios, centrados en general en las peculiaridades y condicionantes de su participación laboral y muy particularmente en el análisis de barreras en el acceso a posiciones jerárquicas y de toma de decisiones.

En un contexto caracterizado por las diferencias entre hombres y mujeres en el acceso a los recursos, en las oportunidades de empleo ((Iversen y Rosenbluth,

2010; Bettio et al., 2013; Giménez-Nadal y Molina, 2014) o en los usos del tiempo y los cuidados (Rodríguez-Galdo y Pis, 2010; Durán, 2012), cobra especial relevancia el impacto de género de las políticas en situaciones de una crisis multidimensional como la vivida. La salida de la crisis ha ido acompañada de la intensificación del trabajo femenino no remunerado, una más tardía y precaria recuperación del empleo de las mujeres y, en definitiva, retrocesos en materia de igualdad (Gálvez y Rodríguez, 2011).

2.1. EVOLUCIÓN DEL EMPLEO Y DEL SALARIO

Los gráficos 1, 2 y 3 muestran, la evolución del cociente entre empleo y la población total de cada país. El gráfico 1 se refiere al empleo femenino, el gráfico 2 al empleo masculino y el gráfico 3 al empleo total.

El gráfico 1 muestra el cociente entre el número de mujeres ocupadas y la población de cada país. Observamos que la crisis del período 2008-2018 afectó negativamente a la evolución creciente de este cociente en todos los países del gráfico excepto en Alemania. Alemania, Reino Unido y Estados Unidos, muestran tasas más elevadas que Francia, España e Italia. Observamos que la tasa de empleo femenino de España en el año 2000 era muy inferior a las de Francia, Alemania, Gran Bretaña y Estados Unidos. Esta variable, en España, experimentó un incremento importante en el período 2000-2007, aproximándose al nivel de Francia, así como un decrecimiento en el período 2007-2013 y una recuperación en 2013-2018.

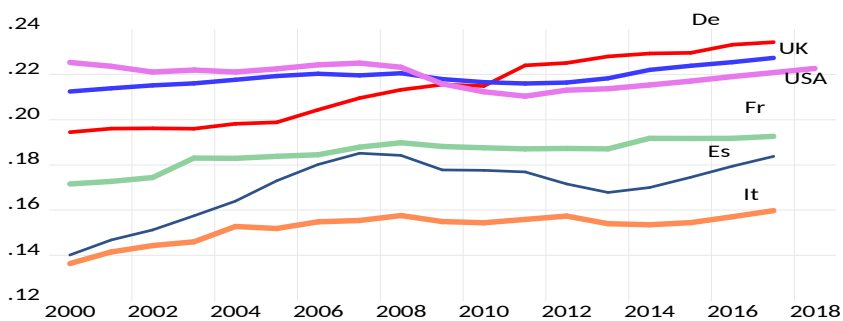


Gráfico 1. Cociente entre empleo femenino y población total

El gráfico 2 recoge el crecimiento de forma sostenible del empleo masculino en el período 2000-2007, debido en gran parte a la burbuja inmobiliaria, y decreció en el periodo 2007-2013, mostrando una recuperación en el periodo 2013-2018, acercándose al nivel de Italia. En el período 2013-2018 se observa unas tasas de empleo masculinas más elevadas en Alemania, Reino Unido y Estados Unidos, en comparación con las tasas más bajas de Italia, España y Francia.

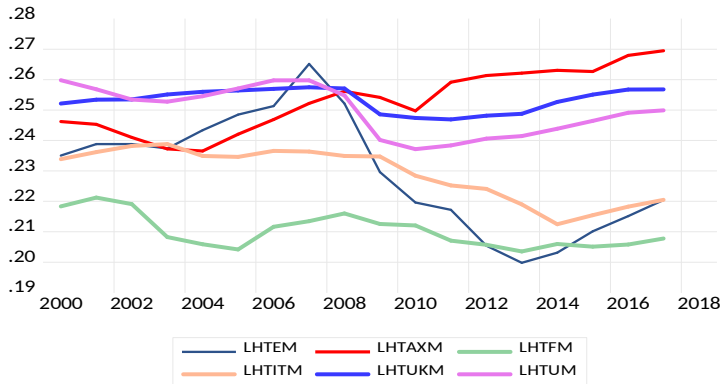


Gráfico 2. Cociente entre empleo masculino y población total.

Nota: España (LHTEM), Alemania (LHTAXM), Francia (LHTFM), Italia (LHTITM), Reino Unido (LHTUKM), Estados Unidos (LHTUM)

En el gráfico 3 se pone de manifiesto como las políticas de empleo en Alemania han elevado la tasa de empleo total, tanto en el período 2000-2008 como en el período 2008-2018. El Reino Unido mantuvo en todo el período una tasa de empleo total elevada, con una pequeña disminución en el período 2008-2012 y una suave recuperación posterior. Las tasas de empleo total son mucho más elevadas en ambos países y Estados Unidos, en comparación con los valores de Francia, España e Italia.

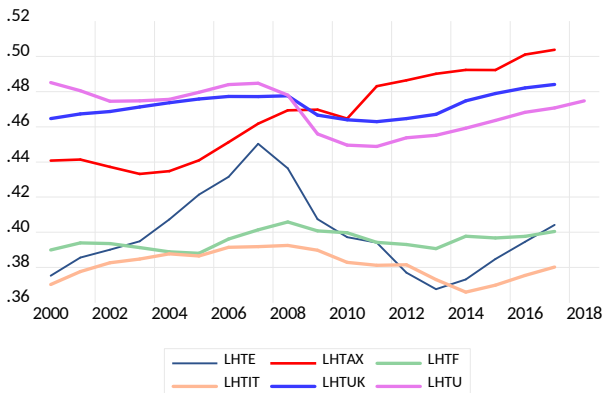


Gráfico 3. Cociente entre empleo total y población total.

Nota: España (LHTEM), Alemania (LHTAXM), Francia (LHTFM), Italia (LHTITM), Reino Unido (LHTUKM), Estados Unidos (LHTUM)

En España por cada 100 habitantes trabajan aproximadamente 40 personas (22 hombres y 18 mujeres), mientras en Alemania trabajan aproximadamente 50 personas (27 hombres y 23 mujeres). Aumentar la tasa de empleo de España hasta el nivel de Alemania supone más oportunidades laborales tanto para hombres como para mujeres.

En el período 2007-2017, España perdió más de 1.6 millones de empleos masculinos e incrementó en menos de 0.2 millones el empleo femenino, mientras

Alemania incrementó el empleo masculino casi en 1.6 y el femenino en más de 2.0 millones.

El gráfico 4 muestra la evolución del salario real general de hombres y mujeres, como coste salarial medio (incluyendo impuestos y seguridad social). Observamos un estancamiento demasiado prolongado en el tiempo, en el caso de España desde 1980 (con la excepción de un incremento en 1990-1992).

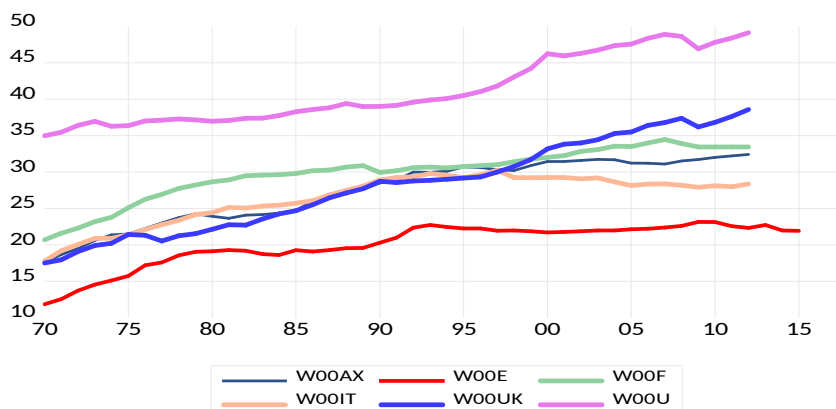


Gráfico 4. Evolución del salario real, en Dólares del año 2000¹

La mejora de la calidad de vida, de hombres y mujeres, depende en gran medida del salario y de las condiciones laborales. Es por ello deseable que España emprenda políticas económicas que permitan una convergencia real del salario con otros países más avanzados.

2.2. IMPACTO DE LA CRISIS SOBRE EL EMPLEO Y EL SALARIO

La tabla 1 muestra la correlación entre las variables salario medio (coste salarial medio, W), producción por habitante (PH) y productividad media del trabajo (PM), con datos de la OCDE.

Tabla 1. Correlación entre PH, PM y W en España y otros cinco países de la OCDE

País	Correlación PH y PM	Correlación PH y W	Correlación PM y W
Alemania	0.9916	0.9717	0.9811
España	0.8779	0.8482	0.9513
Francia	0.9871	0.9170	0.9470
Italia	0.9858	0.9159	0.9371
Reino Unido	0.9876	0.9875	0.9807
USA	0.9766	0.9850	0.9814

¹ W00=coste salarial medio, en miles de Dólares del año 2000 por asalariado. Datos de Alemania (AX, incluye el país completo incluso en los años en que estaba dividido), España (E), Francia (F), Italia (IT), Reino Unido (UK), Estados Unidos (U). Fuente: Elaborado partir de Datos de Contabilidad Nacional de la OCDE y otras fuentes.

Observamos una correlación muy elevada, la cual se explica en los modelos econométricos del salario como los incluidos en Guisán, Aguayo y Expósito (2011) para un conjunto de 3 países de la OCDE, en los que el salario (W00) se estimó mediante mínimos cuadrados en dos etapas no lineales, en el conjunto de un sistema de ecuaciones de Empleo y Salario, en función de su valor retardado y del incremento de PM.

De acuerdo con los modelos de empleo, analizados en Guisán (2004), en Guisán, Aguayo y Expósito (2011) y en otros estudios, el PIB real es la variable con mayor influencia sobre el empleo. El cociente entre el PIB y el salario (PIB/W) es también importante, pero en el caso de España el problema no está en un valor elevado de W, en comparación con los otros países de este estudio, sino en un valor insuficiente del PIB real. Por lo tanto las políticas económicas deben centrarse en aumentar la producción y no en disminuir el salario.

La tabla 2 muestra los resultados de la estimación MC2ENL de la ecuación del salario. Q00 es el PIB real y W00 el salario real. Q00 está medido en millones de dólares, y W00 en miles de dólares por trabajador asalariado, a precios y tipos de cambio del año 2000.

Los datos corresponden a España, Alemania y Estados Unidos, en el período 1965-2007, y han sido elaborados a partir de las estadísticas de la OCDE.

Observamos un coeficiente de 0.47 para el incremento de PM, que resultó significativo, de forma que los incrementos de productividad media son muy importantes para el incremento del salario real. La bondad del ajuste es muy elevada, con un R² ajustado de 0.9972 y un error estándar que supone sólo un 1.77% del valor medio de la variable dependiente.

Tabla 2. Ecuación del salario en función de la productividad del trabajo

Dependent Variable: W00				
Method: Two-Stage Least Squares (TSLNS). Sample: 1 129				
W00=C(1)*W00R+C(2)*((Q00/LT)-(Q00R/LTR))				
Instrument list: LTR W00R Q00 Q00R DPA				
	Coefficient	Std. Error	t-Statistic	Prob.
C(4)	1.001396	0.002342	427.5558	0.0000
C(5)	0.473782	0.087079	5.440856	0.0000
R-squared	0.997238	Mean dependent var		28.35919
Adjusted R-squared	0.997216	S.D. dependent var		9.515818
S.E. of regression	0.502071	Sum squared resid		32.01360
Durbin-Watson stat	1.405438	Second-Stage SSR		37.28174

Fuente: Guisán, Aguayo y Expósito (2011).

El hecho de que España tenga la menor productividad media del trabajo (PM) del conjunto de 6 países de la OCDE de los gráficos 1 a 4, explica también que tenga un salario menor. La explicación de la productividad media está muy relacionada con la producción sectorial.

Como hemos analizado en Guisán (2010) y otros estudios, existe una evidencia favorable a las teorías de Kaldor, de forma que la industria actúa como un motor de la economía en varios sentidos: el incremento de productividad industrial se transmite al valor de PM en otros sectores, y el incremento de producción industrial por habitante contribuye a incrementar la producción por habitante y el empleo de diversos sectores, especialmente de los Servicios. Ello implica un incremento del PIB real per cápita, el salario y la tasa de empleo

2.3. LA BRECHA SALARIAL DE GÉNERO

A pesar de su reducción en los últimos años, la discriminación salarial por género sigue caracterizando a los mercados de trabajo europeos. La brecha salarial está muy relacionada con otras importantes desigualdades de género como la concentración en determinadas ramas de actividad u ocupaciones, diferentes jornadas laborales, la precariedad de sus contratos o las menores posibilidades de promoción (De La Rica, 2004; Del Río y Alonso, 2010; Dueñas y otros, 2014).

Según datos de Eurostat, en 2017, los ingresos brutos por hora de las mujeres estaban en promedio un 16,0% por debajo de los de los hombres en la UE, siendo Estonia el país que presenta una mayor brecha de género (25,6%) y correspondiendo a Rumanía la más baja (3,5%).

De acuerdo a los datos de INE, la brecha salarial entre hombres y mujeres apenas ha disminuido para el caso de España en el período 2007-2017. El salario medio anual de las mujeres en España fue de 16.943,89 euros, frente a los 22.780,29 euros de los hombres (un 25,6% menos) en 2007, pasando a una diferencia del 23,2% en el último año en el que los sueldos aumentan pero la diferencia entre ambos sexos apenas se reduce.

2.4. CONDICIONES LABORALES Y CONCILIACIÓN DE LA VIDA LABORAL Y FAMILIAR

La calidad del trabajo depende de varios factores, como las oportunidades de empleo, las oportunidades de promoción, el salario, el ambiente de trabajo y la conciliación de la vida laboral y familiar.

Por lo que respecta al salario ya hemos visto que el estancamiento y el mantenimiento de la brecha salarial no han mejorado la situación de las mujeres en España en el período 2008-2018.

Respecto a la conciliación es importante destacar que la crisis parece haber tenido una influencia negativa, al disminuir la flexibilidad de horarios y aumentar el presencialismo en las empresas.

Las Heras (2018) dirigió un estudio de la conciliación de la vida laboral y familiar en España, y compara los resultados con los de estudios realizados en otros países desarrollados en el período 2010-2018, y encuentra diferencias importantes. *"Avance cero. Este es el saldo que arroja en España la conciliación entre la vida laboral y la personal en los últimos diez*

años. Así lo atestigua el último informe del índice de responsabilidad familiar corporativa (Ifrei) realizado por Iese y donde se indica que el 73% de los empleados en España considera que su entorno laboral dificulta ocasional o sistemáticamente el equilibrio entre el trabajo y la vida privada." ... "El castigo de la crisis ha sido fuerte en España, tanto por los recortes que supuso a nivel laboral y de apoyo a las políticas familiares, como por la introducción del factor miedo, que aún persiste. El miedo a perder el trabajo, el miedo insuflado por las empresas ha enquistado la práctica del presencialismo." (Véase nota de prensa de La Vanguardia).

Dicho estudio clasifica los "entornos laborales" en cuatro categorías según apoyen más o menos el equilibrio entre la vida laboral y la vida personal y familiar de los empleados: enriquecedor, favorable, desfavorable o contaminante. En España el 27% de los ambientes de trabajo tendrían un ambiente enriquecedor o favorable, mientras que el 45 % sería desfavorable y el 28% contaminante. En los otros países de la comparación el 50% serán ambientes enriquecedores o favorables, el 39% serían entornos desfavorables y el 12% tendrían ambiente contaminante.

3. LIDERAZGO FEMENINO

3.1. UNIVERSIDADES

En el estudio de la European Universities Association (EUA, 2017) los datos relativos a la presencia de mujeres en puestos de liderazgo en las universidades de los 47 países miembros de EUA presentan sólo un 12% de rectoras. Cabe destacar, importantes diferencias entre países: con un porcentaje superior al 30% en Suecia, Noruega y Finlandia; entre un 16%-20% (Suiza, Letonia, Croacia, Alemania, Bélgica, Reino Unido y Rusia); entre 11-15% para los casos de Dinamarca y Portugal; frente a un porcentaje de rectoras inferior al 10% en países como España, Bulgaria, Ucrania, República Checa, Turquía e Italia. Por otra parte, el grupo de personas elegibles para este cargo está altamente desequilibrado en términos de género, ya que, según indica el informe "She Figures" (Comisión Europea, 2015), sólo el 21% del profesorado catedrático de universidad en la UE-28 son mujeres.

En España, la Unidad de Mujeres y Ciencia del Ministerio de Economía ha venido publicando (desde el 2007) los informes bienales de "Científicas en cifras" que constatan el mantenimiento de las desigualdades de género en la trayectoria académica y en la representación en los órganos de gobierno. En su quinta edición, el informe destaca que en las universidades públicas españolas siguen solo un 21% de mujeres entre su profesorado catedrático de universidad, se alcanzó el equilibrio de género en el nivel de vicerectoras, con un 41%, pero sólo un 8% de rectoras. La persistencia de un techo de cristal que se confirma con el escaso número de rectoras o en el número de mujeres en las reales académicas (Pérez Sedeño, 2003) y estereotipos que afectan a la elección de carrera y a los criterios de valoración de méritos académicos y profesionales (Ion y otros, 2013) y, por lo tanto, en la promoción académica y laboral de las mujeres (Pereira y otros, 2018).

3.2. REPRESENTACIÓN POLÍTICA

El número de mujeres en parlamentos nacionales, gobiernos y asambleas regionales y locales ha aumentado en muchas regiones y países. Sin embargo el poder partidista, en las cúpulas tiene una escasa presencia de mujeres. Se admite a las mujeres como colaboradoras, pero pocas tienen poder para ejercer labores directivas. La asignación de cuotas ha contribuido a disminuir la marginación de las mujeres en estas instituciones.

En España, en el año 2007, la Ley Orgánica para la igualdad efectiva de mujeres y hombres estableció que en los municipios mayores de 3000 habitantes, ningún sexo tendría una representación menor del 40%. (Véase nota de prensa de la Voz de Galicia). Esta medida incrementó las oportunidades para las mujeres.

En las elecciones municipales de España, el porcentaje de mujeres concejales pasó del 16.45%, del total de concejales, en 2005 al 35.57% en 2015. El número de alcaldesas pasó del 6.5% de los municipios al 19% en dicho período. (Véase nota de prensa de El Mundo).

La UI (2018) presenta un informe sobre mujeres en el Parlamento. En la página 3 incluye un cuadro con la evolución de la representación femenina en los parlamentos de diversas áreas geográficas, en el que se observa un importante incremento en el período 1995 y enero de 2018. El promedio mundial pasó del 11.3% al 23.4. Se produjo un incremento en todas las áreas incluidas en el informe: América de 12.7 a 28.4; Europa de 13.2 a 27.1; África Subsahariana de 9.8 a 23.6; Estados Árabes de 4.3 a 17.5; Pacífico de 6.3 a 17.9; Asia de 13.2 a 18.6.

EIGE ((2017) presenta varios indicadores para la elaboración del Gender Equality Index (GEI) del año 2015. Recoge indicadores de poder por género en los países de la Unión Europea (UE28), de los cuales destacamos los datos de cinco indicadores en Alemania, España, Francia, Italia y Reino Unido, que incluimos en la siguiente tabla.

Tabla 3. Porcentaje de mujeres en el año 2015, según datos de EIGE (2017)

Indicador (%)	Alemania	España	Francia	Italia	Reino Unido
Ministros/as	41.7	28.7	47.6	27.2	24.3
Parlamento nacional	36.7	38.4	25.8	30.2	25.6
Parlamentos regionales	32.0	44.7	48.3	17.3	32.0
Boards of Companies	25.7	18.2	34.8	26.7	25.8
Central Bank	17.6	26.7	39.4	20.4	16.0

Si comparamos los datos con los que figuraban en el estudio de Guisán, Aguayo y Expósito (2012), u otras fuentes, se observan importantes avances en las primeras décadas del siglo veintiuno, pero todavía hay poca representatividad de las mujeres en algunas instituciones, especialmente en los niveles máximos de decisión.

4. VISIBILIDAD PROFESIONAL Y SOCIAL DE LAS MUJERES Y CALIDAD DE VIDA

4.1. VISIBILIDAD

Varios organismos se ocupan de hacer un seguimiento de la presencia de las mujeres en los medios de comunicación y de otras formas de visibilidad. Los resultados indican la persistente falta de visibilidad de las aportaciones femeninas a la política, la economía, la ciencia y la sociedad, en los medios de comunicación, a pesar de los avances de las mujeres en esas actividades.

Hay algunas iniciativas positivas pero todavía hay mucho que avanzar. La situación en el año 2008 en las noticias era de sólo 6% de mujeres en entrevistas a profesionales y el 10% de los políticos. Por otra parte, según el reciente II Informe Columnistas, elaborado por la consultora de comunicación Planner Media, la presencia de la mujer en el periodismo de opinión se caracteriza por un 21% como firmante de las columnas y tribunas.

La falta de invitaciones a mujeres cualificadas para participar como expertas en las televisiones y en otros actos, ha llevado a un movimiento de hombres solidarios que se niegan a participar si en mesas redondas de 3 o más personas no hay por lo menos una mujer. Además, han surgido iniciativas para dar visibilidad a las mujeres como grupos de “Mujeres Referentes”, que contribuyen a avanzar en este sentido.

Así mismo, en los Premios científicos está claro que las mujeres están subrepresentadas en comparación con los hombres del mismo nivel de cualificación. Podríamos indicar numerosos ejemplos, como los de los economistas hasta el año 2018 (sólo una mujer entre todos los Premios Nobel, y sólo una mujer entre todos los Premios del Consejo General del Colegio de Economistas), a pesar de que en las últimas décadas la representación femenina en cátedras y posiciones destacadas en los rankings académicos es superior al 20% y en algunos casos próxima al 40%. En los Premios de Economía Rey Juan Carlos no figura ninguna mujer entre los 16 galardonados del período 1986-2016. Así mismo, en los Premios de Economía Rey Jaime I no figura ninguna mujer entre los 20 galardonados del período 1997-2016.

A pesar de indicadores como su presencia e impacto de sus investigaciones en la reconocida base internacional Ideas, siendo mujeres el 25.2% de economistas incluidos (14057 de un total de 55674), y que para el caso de España ocupan el 21% en los 100 puestos más destacados de economistas de dicha base (por el número de lectores), las economistas no están incluidas en estas proporciones ni en los debates de los medios de comunicación, ni en los premios, ni en otros tipos de distinciones.

4.2. CALIDAD DE VIDA

La calidad de vida en España es más elevada que en otros países desarrollados en lo que respecta a la esperanza de vida, pero no en la calidad de la vida laboral.

Ha habido avances en la esperanza de vida en España, pues la sanidad ha seguido mejorando a pesar de los recortes en el gasto en salud por habitante. Para las mujeres dicha esperanza ha pasado de 84.14 años en el año 2007 a

86.16 en el año 2017, y para los hombres ha pasado de 77.79 a 80.60 en el mismo período.

Los indicadores de la OCDE de “Better Life Index” (BLI) nos permiten disponer de varios indicadores por país y por género. En lo que respecta al índice de satisfacción con la vida los países más avanzados de Europa alcanzan niveles de 7.5 puntos sobre 10, mientras que los menos avanzados tienen 5.5. España se sitúa en una posición intermedia, con 6.4 puntos (6.5 en el caso de las mujeres y 6.3 en el caso de los hombres).

Sin embargo, hay que tener en cuenta que las crisis económicas no sólo repercuten con más intensidad en las condiciones de trabajo, los salarios, tipo de jornada y vulnerabilidad laboral de las mujeres (Benería, 2003; Gálvez y Rodríguez, 2017); sino que también en su calidad de vida dados los insuficientes avances en una distribución corresponsable de los usos tiempo y de los trabajos.

5. CONCLUSIONES

La principal conclusión es que la crisis económica del período 2008-2013 ha supuesto un estancamiento, o una disminución, en las condiciones laborales y de calidad de vida de España y ha detenido el avance de la participación femenina en muchas actividades. Para acercarnos a los niveles de calidad de vida laboral de otros países más avanzados es imprescindible mejorar las políticas económicas. La pérdida de un 25% de la producción industrial ha tenido repercusiones negativas y la recuperación debería ser más intensa. Es muy importante impulsar las rentas generadas en la industria ya que ese desarrollo impulsa el desarrollo de los sectores de servicios, que son los que más crean empleo femenino y empleo total.

En los últimos años, ha habido mejoras en la participación política y en la esperanza de vida, pero también un estancamiento o disminución en salario real, oportunidades laborales y conciliación que repercuten, en especial, en las condiciones de trabajo y vida de las mujeres.

REFERENCIAS

- BENERÍA, L. (2003) *Gender, Development, and Globalization. Economics as If People Mattered*. Nueva York: Routledge.
- DE LA RICA, S. (2004): Wage gaps between workers with indefinite and fixed-term contracts: The impact of firm and occupational segregation. *Moneda y Crédito*, 219(1), 43-69.
- DEL RÍO, C.; ALONSO-VILLAR, O. (2010): Gender segregation in the Spanish labor market: An alternative approach. *Social Indicators Research*, 98 (2), 337-362.
- DUEÑAS, D.; IGLESIAS, Carlos; LLORENTE, R. (2014): Occupational segregation by sex in Spain: Exclusion or confinement? *International Labour Review*, 153(2), 311-336.
- BETTIO, F.; CORSI, M.; D'IPPOLITI, C.; LYBERAKI, A.; SAMEK, M.; VERASHCHAGINA, A. (2013): *The impact of the economic crisis on the situation of women and men and on gender equality policies*. Luxembourg: Publications Office of the European Union.
- DURÁN, A. (2011): *El trabajo no remunerado en la economía global*, Fundación BBVA.
- EIGE (2019). Gender Equality Index 2017: Measuring gender equality in the European Union 2005-2015 - Report. European Institute of Gender Equality. <https://eige.europa.eu/>

- EUA (2017): Female leadership in Europe. European Universities Association. <https://eua.eu/news/47:female-university-leadership-in-europe.html>
- European Parliament (2018): Women in Regional Assemblies. Disponible en: [http://www.europarl.europa.eu/RegData/etudes/ATAG/2019/635549/EPRS_ATA\(2019\)635549_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/ATAG/2019/635549/EPRS_ATA(2019)635549_EN.pdf)
- GÁLVEZ, L.; RODRÍGUEZ, P. (2011): La desigualdad de género en las crisis económicas. *Investigaciones Feministas*, Vol. 2, 113-132.
- GÁLVEZ, L.; RODRÍGUEZ, P. (2017): Crisis, austeridad y transformaciones en las desigualdades de género. *Ekonomiaz: Revista vasca de economía*, nº 91, 330-359.
- GUISÁN, M.C. (2004): Modelos econométricos del empleo en España: análisis comparativo de especificaciones dinámicas e impacto de la industria manufacturera sobre el empleo no agrario, 1964-2003. Documento nº 77 de la serie *Economic Development*. Disponible en Ideas.Repec.
- GUISÁN, M.C. (2010): Desarrollo económico mundial en 2000-2010: análisis de la OCDE, América latina, África y Asia. *Estudios Económicos de Desarrollo Internacional*, Vol. 10-2. Disponible en Ideas.Repec.
- GUISAN, M.C.; AGUAYO, E. (2011): Women Participation, Quality of Government and Economic Development in Europe, 2000-2007. *Applied Econometrics and International Development*, 11(1), 25-42. Disponible en Ideas.Repec.
- GUISAN, M. C.; AGUAYO, E.; EXPOSITO, P. (2011): *Temas de Econometría Aplicada: Producción, empleo, salarios, comercio exterior, educación, sanidad, industria, turismo, calidad de vida e igualdad de género*. EE9 Asociación Hispalink Galicia.
- GUISAN, M. C.; AGUAYO, E.; EXPOSITO, P. (2012): *Empleo sectorial y participación social. Situación en Europa desde una perspectiva de género*. Serie Estudios Económicos, EE10, Asociación Hispalink Galicia
- GUISAN, M. C.; AGUAYO, E.; EXPOSITO, P. (2018): Empleo sectorial y participación social en España y en Europa desde una perspectiva de género. Working paper *Economic Development*, 119. Universidade de Santiago de Compostela. Disponible en Ideas.Repec.
- GIMÉNEZ-NADAL, J. I.; MOLINA, J. A. (2014): Regional unemployment, gender, and time allocation of the unemployed. *Review of Economics of the Household*, 12 (1), 105- 126.
- ION, G.; DURAN-BELLONCH, M.; BERNABEU, M. D. (2013). El profesorado y su percepción sobre la igualdad de género en la universidad. *Revista Complutense de Educación*, 24(1), 123-140.
- IVERSEN, T.; ROSENBLUTH, F. (2010): *Women, Work, and Politics: The Political Economy of Gender Inequality*. New Haven, CT: Yale University Press.
- LAS HERAS, M. (coord.) (2018): *Informe del Índice de Responsabilidad Familiar Corporativa (Ifrei): España*, Editorial IESE.
- PEREIRA, D; LÓPEZ, A.; AGUAYO, E.; CARREIRO, M. (2018). AMIT: una asociación de mujeres científicas y tecnólogas para visibilizar la importancia de la igualdad en el avance de la Ciencia. *I Seminario Mujeres investigadoras e investigación sobre mujeres en las universidades ibéricas*.
- RODRÍGUEZ GALDO, María Xosé; PIS SÁNCHEZ, Eduardo J. (2010): Midiendo con perspectiva de género. Reflexiones a partir de la encuesta de los usos del tiempo de los hogares de Galicia. *Revista Galega de Economía*, 9(2), 5-28.
- UI (2018). *Las mujeres en el Parlamento en 2017. Perspectiva anual*. Unión interparlamentaria.
- UNIDAD DE MUJER Y CIENCIA (2019). *Científicas en cifras. 2017*. Secretaria de Estado de Universidades, Investigación, Desarrollo e Innovación.

ANEXO:

NOTAS DE PRENSA E INTERNET

Europa Press:

<https://www.europapress.es/nacional/noticia-mas-70-alcaldes-capitales-provincia-son-hombres-20180920101313.html>

El Mundo:

<https://www.elmundo.es/espana/2015/10/20/5613b8e5e2704ec9198b45b9.html>

La Vanguardia:

<https://www.lavanguardia.com/vida/20180615/45113791899/conciliacion-informe-iese-em-presas.html>

La Voz de Galicia:

https://www.lavozdeg Galicia.es/noticia/galicia/2018/01/15/galicia-segunda-comunidad-porcentaje-alcaldesas/0003_201801G15P2997.htm

Asociación Hispalink Galicia:

<http://www.usc.es/economet/galicia.htm>

Web con otros estudios de las autoras relacionados con el empleo y la participación social de las mujeres (libros, blogs, informes y artículos):

<http://www.usc.es/economet/econometria.htm>

UN NUEVO ENFOQUE PARA UNA ESTRATEGIA DE ARBITRAJE ESTADÍSTICO. EL MÉTODO HP

JOSÉ PEDRO RAMOS REQUENA

Departamento Economía y Empresa/Universidad de Almería
Carretera de Sacramento, s/n. 04120 La Canadá de San Urbano. Almería/jpramosre@ual.es

JUAN E. TRINIDAD SEGOVIA

Departamento Economía y Empresa/Universidad de Almería
Carretera de Sacramento, s/n. 04120 La Canadá de San Urbano. Almería/jtrini@ual.es

MIGUEL ÁNGEL SÁNCHEZ GRANERO

Departamento Matemáticas /Universidad de Almería
Carretera de Sacramento, s/n. 04120 La Canadá de San Urbano. Almería/ misanche@ual.es

e-mail José Pedro Ramos Requena: jpramosre@ual.es

Resumen

La estrategia de Pairs Trading es una estrategia de arbitraje estadístico neutra a mercado. Surgió a finales de los años 80 en un banco de inversión americano, con el objetivo de buscar nuevos métodos de arbitraje utilizando modelos estadísticos.

El Pairs Trading consistente en buscar dos acciones cuyos precios históricos se han movido de una manera similar y arbitrarlos cuando se produzca una desviación. Desde su creación han sido multitud los artículos relaciones en la búsqueda de nuevos métodos para mejorar la selección de pares y mejorar la rentabilidad de la estrategia.

En este trabajo vamos a abordar un nuevo enfoque para la selección de pares. Concretamente, estudiamos el exponente de Hurst de una serie, calculada como la suma acumulada del producto de la rentabilidad (logarítmica) de dos acciones. Si las acciones están altamente correlacionadas, el producto tenderá a ser más positivo que negativo, por lo que la serie tenderá a moverse en la misma dirección, y por tanto, el valor del exponente de Hurst de la serie será cercano a 1. Si las acciones son independientes, el producto será aleatoriamente positivo o negativo, en una proporción aproximadamente igual, por lo que la serie se moverá aleatoriamente hacia arriba y hacia abajo, lo que dará un valor del exponente de Hurst de la serie cercano a 0,5. De esta manera, proporcionamos una forma alternativa para medir el grado de co-movimiento entre dos acciones, que llamamos HP. Este nuevo método lo planteamos como alternativa a los métodos de la Distancia y la Correlación.

Para mostrar el funcionamiento de nuestro método, emplearemos los valores correspondientes al mercado estadounidense a través del índice Dow Jones para el periodo correspondiente entre el 01 de enero de 2009 hasta el 31 de diciembre de 2018, para comprobar su robustez dividimos este estudio en 3 subperiodos de 3 años. Compararemos los resultados con las estrategias ya conocidas y mostraremos si el nuevo método que planteamos es superior.

Palabras clave: Arbitraje estadístico, Mercados financieros, Pairs Trading, Exponente de Hurst.

Abstract

The Pairs Trading strategy is a market neutral statistical arbitrage strategy. It emerged in the late 80's in an American investment bank, with the aim of seeking new methods of arbitrage using statistical models.

Pairs Trading consists of looking for two shares whose historical prices have moved in a similar way and arbitrate them when a deviation occurs. Since its creation there have been many related papers in the search for new methods to improve the selection of pairs and improve the profitability of the strategy.

In this paper we will address a new approach to pairs selection. In particular, we study the Hurst exponent of a series, which is made by calculating the cumulative sum of the product of the log-return of two stocks. If the stocks are highly correlated, the resulting product will often be positive, so the series would always move in the same direction, so the Hurst exponent of the series will have a high value close to 1. If the stocks are independent, the product will randomly be positive or negative, in a roughly equal proportion, so the series will move randomly up and down, which will give a value of the Hurst exponent of the series close to 0.5. In this way, we provide an alternative way, which we call HP, to measure the degree of co-movement between two stocks. We propose this new method as an alternative the Distance and Correlation methods.

To show how our method works, we will use the values corresponding to the U.S. market through the Dow Jones index for the corresponding period from January 2009 to December 2018, to test its robustness we divide this study into 3 subperiods of 3 years. We will compare the results with the already known strategies and we will show if the new method we are proposing is superior.

Key Words: Statistical Arbitrage, Financial Markets, Pairs Trading, Hurst exponent.

1. INTRODUCCIÓN

El arbitraje estadístico (Pole, 2011) es una estrategia cuantitativa de inversión y de trading ampliamente utilizada en los mercados financieros, interviniendo desde inversionistas institucionales, hedge funds e inversores individuales (Krauss, 2017). En el arbitraje estadístico se van a emplear multitud de activos financieros de diferentes categorías, como acciones, opciones, bonos, futuros, materias primas, etc. Para arbitrar en los mercados, los inversores tienen que comprar los activos a bajo precio y vender a corto plazo. En esta estrategia de arbitraje estadístico, las oportunidades de arbitraje existen como consecuencia de la ineficiencia del mercado (LeRoy y Werner, 2014).

Una de las estrategias de arbitraje estadístico más conocida es la denominada estrategia de Pairs Trading (Vidyamurthy, 2004; Whistler, 2004; Ehrman, 2006) que fue desarrollado en Morgan Stanley por un grupo de inversión bajo la dirección de Nunzio Tartaglia, en la mitad de los años ochenta (Bookstaber, 2007). Dado que el arbitraje estadístico es capaz de cubrir el riesgo sistemático y, por lo tanto, los beneficios son independientes de los movimientos y de las condiciones de los mercados predominantes (volátiles, o a la baja), es lo que denominamos como estrategia neutra a mercado (Nicholas, 2000; Jacobs y Levi, 2005).

En este estudio, introducimos un nuevo modelo denominado HP, y realizaremos una comparativa con los métodos clásicos (distancia y correlación), para lo que utilizaremos los valores que componen el índice del Dow Jones.

La estructura de este trabajo es la siguiente: en el siguiente epígrafe realizaremos una revisión de la literatura, en la tercera sección explicaremos los modelos clásicos y el HP, en la cuarta presentaremos los resultados obtenidos y por último desarrollaremos la conclusión a la que llegamos en este trabajo.

2. REVISIÓN DE LA LITERATURA

La estrategia de arbitraje estadístico, Pairs Trading, continúa fascinando a profesionales y científicos. En el ámbito científico, el pionero fue Gatev et al (1999) donde se desarrolla el método de la Distancia. Los autores documentaron ganancias estadísticamente significativas para el mercado de renta variable estadounidense durante el periodo comprendido entre 1962 y 1997. Posteriormente, en 2006, extendieron su análisis hasta 2002, obteniendo una rentabilidad media anual del 11%.

En 2004 Vidyamurthy discute el marco teórico del Pairs Trading usando un método denominado Cointegración y que se basa en la representación del modelo de corrección de errores definido por Engle y Granger (1987). Caldeira y Moura (2013) realiza un estudio utilizando este método para el mercado de valores de Sao Paulo. Los resultados que se obtienen son unos beneficios anuales del 16,38% para el periodo 2005 a 2012.

Elliott et al (2005) suponen que los pares siguen un modelo de reversión a la media utilizando cadenas de Markov y proponen un enfoque de Pairs Trading basado en las predicciones del diferencial y el calibrado a partir de las observaciones del mercado. Perlin (2009) llega a la conclusión de que la estrategia de Pairs Trading obtiene beneficios significativos en su aplicación al

mercado financiero brasileño. En 2010, Do y Faff replicaron el trabajo de Gatev et al (2006) y extienden su muestra original para incluir los años comprendidos entre 2000 y 2009. Los autores prueban que la estrategia sigue siendo rentable, pero con una tendencia decreciente que atribuyen a un empeoramiento de los riesgos de arbitraje. Los mismos autores examinaron en 2010 el impacto de los costes de transacción en la estrategia de Pairs Trading para el mercado de valores de EE.UU. y observaron que después de 2002 la estrategia ya no era rentable.

El modelo de Cópula propuesto por Huck (2010) y Xie y Wu (2013), se centra en la optimización de las diferentes fases en el desarrollo de la estrategia y en el control de las variables que afectan a la misma.

Por último, debemos destacar el trabajo realizado por Ramos-Requena et al (2017), en el que introducen el método del exponente de Hurst, para la estrategia de Pairs Trading. En este trabajo, emplean datos del Dow Jones, para el periodo 2000-2015, en el que se puede observar que su rentabilidad es superior frente a los métodos de la distancia y la correlación, destacando especialmente en periodos de alta volatilidad.

3. METODOLOGÍA

En este epígrafe explicaremos los métodos de selección que vamos a emplear para llevar a cabo nuestro estudio.

3.1. MÉTODO DE LA DISTANCIA

Este método fue desarrollado por Gatev et al (2006: 797-287) y posteriormente aplicado por Andrade et al (2005), Engelberg et al (2009), Perlin (2009: 122-136), Do et al (2010a: 83-95), Bowen et al (2010: 31-38) y Do et al (2010b: 261-287); este método define el co-movimiento de dos activos, como la distancia al cuadrado de las series de precios normalizadas. Este método asume que cuanto menor sea la distancia entre los precios normalizados de dos acciones, mayor será el movimiento conjunto del par. La distancia al cuadrado se calcula como sigue:

$$d(A, B)^2 = \sum_t (P_A(t) - P_B(t))^2 \quad (2.1)$$

donde, PA y PB son los precios normalizados de las acciones A y B en el periodo t.

La normalización de precios se puede realizar de varias formas. Gatev et al (2006: 797-287) proponen convertir la serie de precios en una serie de retornos acumulados, lo que es equivalente a transformarla en una serie de precios en base uno, asumiendo el primer precio normalizado de la serie igual a 1.

Una vez calculada la diferencia entre las acciones, se procederá a elegir aquellos pares que tengan menor distancia.

3.2. CORRELACIÓN

Esta estrategia se centra en la elección de los valores en base al grado de correlación existente entre ellos (Wong, 2010). Se utiliza el Coeficiente de Correlación de Pearson para analizar los diferentes pares potenciales y su grado de correlación. El coeficiente de correlación viene dado por la expresión:

$$\rho = \frac{\sum_{i=1}^n (A_i - \bar{A}_i)(B_i - \bar{B}_i)}{\sqrt{\sum_{i=1}^n (A_i - \bar{A}_i)^2} \sqrt{\sum_{i=1}^n (B_i - \bar{B}_i)^2}} \quad (2.2)$$

Preston (2005) indica que las acciones o índices que sean buenos candidatos para Pairs Trading deben tener alguna relación medible. Lo ideal es que tengan una correlación positiva. Se considera que el nivel de correlación es suficientemente alto si su valor es cercano a 1 en términos absolutos.

Un valor alto de correlación indicará que ambos valores se mueven de forma muy similar, tanto ante aumentos como disminuciones de valor y en similar proporción. De esta manera, si el par de valores se aleja de este equilibrio será de forma temporal y tendrá un movimiento corrector para volver a la situación de equilibrio.

3.3. EL MÉTODO HP

Este método sería una alternativa novedosa para medir la correlación entre dos activos. Si r y s son el *log-rendimiento* de dos activos, llamaremos serie de productos de los activos a la serie de suma acumulada del producto de r y s :

$rs_n = \sum_{i=1}^n r_i s_i$, donde r_i y s_i son la rentabilidad de cada uno de los activos en cada periodo. Si los dos activos no están correlacionados, el producto $r_i s_i$ será positivo aproximadamente la mitad de las veces y la serie de productos rs_n estará cerca de un movimiento browniano (o un proceso sin memoria), mientras que si los dos activos están correlacionados, entonces el producto $r_i s_i$ tenderá a tener el mismo signo, por lo que la serie de productos rs_n aumentará (con correlación positiva) o disminuirá (con correlación negativa), por lo que tendrá una memoria a largo plazo.

Con base en la discusión anterior, podemos medir el grado de correlación de los dos activos calculando el exponente Hurst H de la serie de productos rs_n : cuando H está cerca de 0,5 los activos tendrán baja correlación, mientras que H cerca de 1 significará que los activos tienen alta correlación.

Como en una estrategia de Pair Trading buscamos dos activos con un alto grado de co-movimiento, podemos buscar un par de activos con un alto valor de H (cerca de 1).

4. RESULTADOS

Para llevar a cabo nuestro estudio empírico, de la aplicación de la estrategia de arbitraje estadístico, vamos a tomar los valores que componen el Dow Jones para el periodo correspondiente entre el 01 de enero de 2009 hasta el 31 de diciembre de 2018, para comprobar su robustez dividimos este estudio en 3 subperiodos de 3 años.

En las tablas 1, 2 y 3 mostramos los principales resultados obtenidos para los 3 periodos de estudio y para las carteras compuestas por 2,5,10,20 y 30 pares.

Tabla 1. Comparativa resultados para el periodo 2009-2012 (**Fuente:** Elaboración Propia)

Nº de Pa- res	Método de Selección	Nº de Ope- raciones	rentabilidad media anualizada	ratio de Sharpe	Rentabilidad con ctes transacción
2	Correlación	98	3,60%	0,73	8,71%
2	Distancia	99	0,90%	0,11	2,00%
2	Hp	100	1,80%	0,36	4,10%
5	Correlación	255	2,80%	0,76	7,09%
5	Distancia	251	-2,20%	-0,23	-6,30%
5	Hp	233	4,40%	1,24	11,43%
10	Correlación	468	3,10%	1,07	7,93%
10	Distancia	499	-1,10%	-0,17	-3,40%
10	Hp	478	2,80%	0,92	7,12%
20	Correlación	965	2,80%	1,14	7,12%
20	Distancia	967	1,40%	0,34	3,12%
20	Hp	955	2,20%	0,92	5,32%
30	Correlación	1456	2,30%	0,97	5,61%
30	Distancia	1439	1,70%	0,51	4,12%
30	Hp	1448	0,90%	0,37	1,82%

Durante el periodo 2009-2012 podemos observar que la mayor rentabilidad del periodo la encontramos para la cartera compuesta por 5 pares y seleccionándolos a través del método HP (11,43%), por el lado contrario podemos observar que la peor rentabilidad se consigue a través del método de la distancia para la cartera de mismos pares (-6,3%). Centrándonos en el ratio de Sharpe, nos encontramos que la mayor rentabilidad por unidad de riesgo es para la cartera compuesta por 5 pares y si es seleccionada mediante el método que nosotros introducidos.

Tabla 2. Comparativa resultados para el periodo 2012-2015 (**Fuente:** Elaboración Propia)

Nº de Pares	Método de Selección	Nº de Ope- raciones	rentabilidad media anualizada	ratio de Sharpe	Rentabili- dad con ctes transacción
2	Correlación	104	0,20%	0,05	-0,12%
2	Distancia	90	3,20%	0,73	7,95%
2	Hp	107	-1,10%	-0,33	-3,34%
5	Correlación	234	0,40%	0,20	0,63%
5	Distancia	232	1,00%	0,32	2,14%

5	Hp	252	-0,10%	-0,03	-0,70%
10	Correlación	496	-0,80%	-0,43	-2,50%
10	Distancia	490	0,00%	0,01	-0,39%
10	Hp	508	-0,60%	-0,38	-2,21%
20	Correlación	994	-1,10%	-0,71	-3,50%
20	Distancia	983	-0,60%	-0,33	-2,09%
20	Hp	965	0,10%	0,09	-0,08%
30	Correlación	1507	-0,80%	-0,54	-2,60%
30	Distancia	1506	-1,20%	-0,68	-3,50%
30	Hp	1508	-0,60%	-0,40	-2,10%

Para el periodo 2012-2015, la mayor rentabilidad media anualizada la encontramos para la cartera compuesta por 2 pares seleccionándolos a través del método de la distancia (3,2%), en este periodo la mayoría de las rentabilidades son negativa a excepción de la cartera compuesta por 2 pares (7,95%) y seleccionándolos a través de la distancia y las carteras de 5 pares mediante la selección de correlación y distancia (0,63% y 2,14%).

Tabla 3. Comparativa resultados para el periodo 2015-2018 (Fuente: Elaboración Propia)

Nº de Pares	Método de Selección	Nº de Operaciones	rentabilidad media anualizada	ratio de Sharpe	Rentabilidad con costes transacción
2	Correlación	94	-0,80%	-0,28	-2,57%
2	Distancia	97	-1,00%	-0,18	-3,09%
2	Hp	97	-1,40%	-0,45	-3,99%
5	Correlación	223	-2,10%	-0,88	-5,85%
5	Distancia	218	-0,60%	-0,18	-1,94%
5	Hp	225	-0,10%	0,05	-0,05%
10	Correlación	451	-1,80%	-0,84	-5,25%
10	Distancia	454	0,00%	-0,01	-0,45%
10	Hp	434	-0,40%	-0,17	-1,43%
20	Correlación	875	1,80%	-0,89	-5,04%
20	Distancia	929	1,00%	0,48	2,24%
20	Hp	873	-1,00%	-0,55	-2,94%
30	Correlación	1343	-0,60%	-0,36	-2,05%
30	Distancia	1392	1,30%	0,68	3,14%
30	Hp	1322	-0,90%	-0,59	-2,84%

Para el periodo 2015-2018, podemos observar que la mayor rentabilidad por unidad de riesgo la obtenemos para la cartera compuesta por 30 pares a través del método de la distancia y para la cartera compuesta por 5 pares seleccionándolos a través del método de HP con un ratio de Sharpe respectivamente de (0,68 y 0,05).

Por último, mostramos dos gráficos en los que mostramos la evolución de los tres métodos para una cartera compuesta por 5 pares.



Figura 1. Comparativa rentabilidades periodo 2009-2012 (Cartera 5 pares). (Fuente: Elaboración Propia)

En la figura 1 podemos observar que el método HP es superior a los dos métodos comparados, destacando que para el periodo 2009-2012 es el único que no presenta una rentabilidad negativa. Si observamos su evolución con respecto al método de la correlación, se mueven de forma muy similar. Podemos destacar que alcanza su pico máximo para el periodo 2010-2011, coincidiendo con la crisis financiera internacional.



Figura 2. Comparativa rentabilidades periodo 2015-2018 (Cartera 5 pares). (Fuente: Elaboración Propia)

En la figura 2 mostramos la evolución de los tres métodos para la cartera de 5 pares durante el periodo 2015-2018. Podemos observar que durante los primeros años de este periodo la mayor rentabilidad se consigue a través del método de la distancia, pero a partir de febrero de 2017 el método HP suele estar por encima de éste y ser la mejor opción para el inversor.

5. CONCLUSIÓN

Observamos que el modelo propuesto en este trabajo mejora los resultados obtenidos con respecto a los métodos clásicos, especialmente en el periodo desde 2009 hasta 2012.

Por tanto, podemos concluir diciendo, que el método HP puede ser una clara alternativa a los métodos clásicos, especialmente al método de correlación, que aumentan sus rentabilidades para los periodos estudiados tomando como referencia los valores que componen el índice Dow Jones.

REFERENCIAS

- BOOKSTABER, R. M. (2007). *A demon of our own design: Markets, hedge funds, and the perils of financial innovation*. J. Wiley.
- CALDEIRA J. y MOURA, G. V. (2013): "Selection of a portfolio of pairs based on cointegration: a statistical arbitrage strategy", *Brazilian Review of Finance*, 11 (1), 49-80.
- DO, B.; FAFF, R.; HAMZA, K. (2010a): Does simple pairs trading still work?, *Financial Analysts Journal*, 66 (4), 83-95.
- DO, B.; FAFF, R.; HAMZA, K. (2010b): Are pairs trading profits robust to trading costs?, *The Journal of Financial Research*, 35 (2), 261-287.
- EHRMAN, D. S. (2006). *The handbook of pairs trading: strategies using equities, options, and futures* (Vol. 240). John Wiley & Sons.
- ELLIOTT, R. J.; VAN DER HOEK, J.; MALCOLM, W. P. (2005): Pairs trading, *Quantitative Finance*, 5 (3), 271-276.
- ENGLE, R.F.; GRANGER, C.W.J. (1987): Co-integration and error correction: representation, estimation, and testing, *Econometrica: Journal of the Econometric Society*, 251-276.
- GATEV, E.; GOETZMANN, W. N.; ROUWENHORST, K. G. (2006): Pairs trading: performance of a relative-value arbitrage rule, *The Review of Financial Studies*, 19, 3, 797-287.
- HUCK, N. (2010): "Pairs trading and outranking: the multi-step-ahead forecasting case", *European Journal of Operational Research*, 207 (3), 1702-1716.
- JACOBS, B. I., & LEVY, K. N. (2005). *Market Neutral Strategies*(Vol. 112). John Wiley & Sons.
- KRAUSS, C. (2017). Statistical arbitrage pairs trading strategies: Review and outlook. *Journal of Economic Surveys*, 31(2), 513-545.
- LEROY, S. F., & WERNER, J. (2014). *Principles of financial economics*. Cambridge University Press.
- NICHOLAS, J. G. (2000). *Market neutral investing*. Princeton, NJ: Bloomberg Press.
- PERLIN, M. S. (2009): Evaluation of pairs trading strategy at the Brazilian financial markets, *Journal of Derivatives and Hedge Funds*, 15 (2), 122-136.
- POLE, A. (2011). *Statistical arbitrage: algorithmic trading insights and techniques* (Vol. 411). John Wiley & Sons.
- RAMOS-REQUENA, J. P.; TRINIDAD-SEGOVIA, J. E.; SÁNCHEZ-GRANERO, M. A. (2017): Introducing Hurst exponent in pair trading. *Physica A: Statistical Mechanics and its Applications*, 488, 39-45.
- VIDYAMURHTY, G. (2004). *Pairs Trading: quantitative methods and analysis* (Vol. 217). John Wiley & Sons.
- WHISTLER, M. (2004). *Trading pairs: capturing profits and hedging risk with statistical arbitrage strategies* (Vol. 216). John Wiley & Sons.
- XIE, W.; WU, Y (2013): Copula-based pairs trading strategy, *Asian Finance Association (AsFA)*, Conference. doi (Vol.10).

INTERACCIONES DE GOBERNANZA EN LAS PESQUERÍAS A PEQUEÑA ESCALA DE GALICIA (NOROESTE DE ESPAÑA): PERCEPCIONES Y DINÁMICAS EN LAS COFRADÍAS DE PESCADORES

IRIA GARCÍA-LORENZO

Departamento de Economía Aplicada/ERENEA/ECOBAS/Campus do Mar/Facultade de Ciencias Económicas y Empresariales
Universidade de Vigo/Campus As Lagoas-Marcosende. 36310, Vigo/iriagarcia@uvigo.es

MANUEL MARÍA VARELA LAFUENTE

Departamento de Economía Aplicada/ERENEA/ECOBAS/ Facultad de Ciencias Económicas y Empresariales
Universidade de Vigo/Campus As Lagoas-Marcosende. 36310, Vigo/mmvarela@uvigo.es

Resumen

La pesca a pequeña escala de Galicia (noroeste de España) cuenta con dinámicas específicas en las relaciones entre sistemas de recurso, sistemas de gobernanza y actores. Entre ellas se encuentra la organización de los mariscadores y pescadores en las llamadas Cofradías de Pescadores, entidades asociativas con reconocimiento administrativo y participación en la gestión de los recursos pesqueros. Estas organizaciones poseen una naturaleza público-privada, donde los miembros comparten y se benefician del uso y la explotación de los recursos marinos.

Este trabajo busca estudiar las percepciones de las cofradías de pescadores como actores de gobernanza de la pesca a pequeña escala. En concreto, el caso estudio trata de valorar los cambios en las actividades que desarrollan las cofradías, como la producción y comercialización, la importancia de la acción de la administración y de la sociedad, y la acción pública. Para conseguir estos objetivos, se aplican los marcos de análisis institucional, el sistema socio ecológico de E. Ostrom y su entorno y el marco de evaluación de la gobernabilidad de Jentoft y Chuenpagdee, los cuales permiten estudiar realidades concretas sin limitarse a una estructura específica.

Palabras clave: Cofradías, pesquerías a pequeña escala, interacciones de gobernanza, sistema socio ecológico.

1. INTRODUCCIÓN

La evolución del estudio de la gobernanza desde modelos y teorías especializados hacia marcos de análisis más complejos aporta un nuevo enfoque a la gestión de recursos comunes. Esta nueva perspectiva busca proporcionar un marco común para el desarrollo de trabajos institucionales, donde se pueden estudiar situaciones concretas sin limitarse a una estructura específica. En el caso de la pesca a pequeña escala, este avance permita analizar realidades regionales donde las relaciones entre sistemas de recurso, sistemas de gobernanza y actores poseen dinámicas propias (Mc Ginnis y Ostrom, 2014; Jentoft y Chuenpagdee, 2015).

En Galicia (Noroeste de España), una dinámica característica es la organización de los mariscadores y pescadores a pequeña escala en las llamadas Cofradías de Pescadores, entidades asociativas con reconocimiento administrativo y participación en la gestión de los recursos pesqueros. Estas cofradías han sido anteriormente estudiadas tanto desde una perspectiva histórica como institucional, llegándose a describir ampliamente su evolución y transformación. Sin embargo, algunas de sus características, como las actividades empresariales que realizan y sus actuaciones como agentes de gobernanza, han sido relegadas a un segundo plano de estudio (Fernández-Vidal y Muiño, 2014; Alló y Loureiro, 2017; Ballesteros, 2018; Astorkiza et al, 2018; García-Lorenzo et al, 2018, 2019). Analizar estas características como actores de gobernanza y las relaciones con otros agentes, permite conocer su capacidad de actuación dentro de la pesca a pequeña escala de Galicia y las posibilidades de mejora en la gestión de los recursos.

Este trabajo busca profundizar en las interacciones de gobernanza en las pesquerías de pequeña escala de Galicia, estudiando las percepciones en el seno de las cofradías de pescadores. El objetivo es analizar sus estrategias frente a las actividades que desarrollan, como la producción y la comercialización, valorar los conflictos con otros actores de gobernanza y estudiar cómo influyen diferentes aspectos de la normativa autonómica, estatal y europea en la organización de las cofradías. Este trabajo se plantea como un caso de estudio de 15 cofradías de pescadores, donde se recogen sus valoraciones y percepciones a través de encuestas y entrevistas en profundidad.

En consecuencia, el artículo comienza exponiendo, en el apartado 2, el marco teórico sobre los marcos de análisis institucional, el sistema socio-ecológico de Ostrom y su entorno (2014) y el marco de evaluación de la gobernabilidad de Jentoft y Chuenpagdee (2015). A continuación, el apartado 3 presenta a las cofradías de pescadores, destacando los principales estudios existentes hasta el momento sobre ellas. El apartado 4 analiza los resultados del caso de estudio y, por último, el apartado 5 resalta las conclusiones más importantes del trabajo.

2. MARCO TEÓRICO

La Nueva Economía Institucional (NEI), como enfoque dentro de Economía de los Recursos Naturales, se centra en las condiciones institucionales de la gestión y en las estrategias de los agentes en ese marco. Tras la inicial consideración de la propiedad como una condición institucional básica que determina la forma de actuar sobre los recursos, el programa de investigación de la NEI se ha nutrido de diferentes equipos de investigación y de una gran variedad de estudios de caso que han permitido avanzar de manera sistemática en este campo.

En los últimos años se ha percibido que los conceptos tradicionales de único dueño y libre acceso, los esquemas interpretativos clásicos como “la tragedia de los comunes” y los niveles de decisión constitucional, de acción colectiva y operacional (Schlager y Ostrom, 1990, 1992) resultan insuficientes y necesitan precisarse para definir las diversas realidades existentes. La finalidad actual del análisis institucional ya no solo es proponer modelos y teorías concretas sino también proporcionar un marco de común para el desarrollo de trabajos. Estos marcos conceptuales permiten la definición de diferentes teorías y buscan desarrollar una terminología común y un esquema de trabajo, que pueda ser usado para construir y comparar investigaciones (McGinnis, 2014). En esta línea, los principales estudios sobre recursos pesqueros giran en torno a dos vertientes: el sistema socio-ecológico, desarrollado por E. Ostrom y su entorno académico; y la gobernanza interactiva, con Kooiman, Jentoft y Chuenpagdee como principales referentes.

El marco del sistema socio-ecológico (SES) surge de una extensa colaboración y discusión de Ostrom con otros investigadores (Anderies et al., 2004, Janssen et al., 2007, Ostrom et al., 2007) y supone un avance del análisis de los sistemas de gobernanza en su relación con los sistemas de recursos. Basado en el marco de Análisis y Desarrollo Institucional, ya usado por los investigadores en el análisis institucional (Kiser y Ostrom, 1982), el marco se encuentra en continuo desarrollo, aunque ya tiene entidad suficiente para ser aplicado (Basurto et al, 2013; Hunt et al, 2013; Nagendra y Ostrom, 2014; Partelow, 2015).

Este marco establece los niveles principales de un sistema socio-ecológico: los sistemas de recurso, las

unidades de recurso, los sistemas de gobernanza y los usuarios. Cada una de estas categorías se considera una variable de primer nivel, la cual se despliega en otras variables de segundo nivel que, a su vez, pueden contener múltiples niveles de detalle. La idea central es que los usuarios extraen las unidades de recurso de un sistema de recursos mediante un sistema de gobernanza, mientras se ven expuestos a influencias exógenas derivadas del entorno. Estas variables exógenas se dividen en el contexto socio-cultural, las reglas de la comunidad y las condiciones físicas y materiales de los ecosistemas relacionados (McGinnis y Ostrom, 2014).

En el centro del marco se colocan las situaciones de acción (Cuadro 1), donde los usuarios y actores se relacionan entre sí en las interacciones de gobernanza y, de esta forma, afectan conjuntamente a los resultados. Las situaciones de acción se ven influidas por los sistemas de recursos y gobernanza, así como por los sistemas sociales, institucionales y biofísicos, los cuales se convierten en insumos para las decisiones tomadas por los individuos. Así, el marco se plantea como un sistema dinámico, donde los múltiples actores se ven influenciados por las diferentes variables, realizan la acción y por ello generan cambios sobre las variables del entorno en un tiempo futuro (McGinnis y Ostrom, 2014).

En relación con la gobernanza interactiva, los conceptos de gobernanza y gobernabilidad han cobrado relevancia al observarse que no hay una sola forma de gobernanza que funcione en todas las situaciones. Basándose en conceptos previamente desarrollados, como la “Nueva Gobernanza” de Rhodes (1996) y la propia “Gobernanza Interactiva” ya definida y discutida por Kooiman y Bavinck (2005), Chuenpagdee y Jentoft proponen el Marco de Evaluación de la Gobernabilidad, que establece diferencias entre el sistema de gobernanza y el sistema a gobernar, así como los modos de gobernanza. En uno de sus trabajos más recientes, desarrollado en conjunto con multiplicidad de autores, Jentoft y Chuenpagdee (2015) aplican este marco de análisis el caso de la pesca a pequeña escala, donde diferentes pesquerías, a pesar de compartir muchas características entre ellas, siempre tienen rasgos distintivos que deben considerarse en el análisis.

El objetivo de la evaluación de la gobernabilidad es entender bajo qué condiciones un sistema de gobernanza particular aborda determinadas cuestiones básicas, como la seguridad alimentaria, la sostenibilidad, la justicia o el cuidado del medio ambiente. En este sentido, la gobernabilidad depende de las características del sistema de gobernanza, del denominado sistema a gobernar (que puede ser tanto natural como social) y de las interacciones de gobernanza (Cuadro 1). El foco del análisis se sitúa en la diversidad (número de especies, agentes, intereses, imágenes, etc.); la complejidad (cómo se relacionan los componentes); las dinámicas de interacción de los componentes; y la escala o límites del sistema. El marco también destaca la relevancia de la identificación de procesos y el análisis de las potencialidades (capacidad, calidad) y los conflictos (Jentoft y Chuenpagdee, 2015).

Cuadro 1. Las interacciones de gobernanza en el Sistema Socio-Ecológico y el Marco de Evaluación de la Gobernabilidad

Situaciones de acción en el Sistema Socio-Ecológico	
Interacciones	Resultados
Producción/Recolección	Medidas de desempeño social (eficiencia, equidad, rendición de cuentas, sostenibilidad)
Participación en la información	
Procesos de deliberación	Medidas de desempeño ecológico (sobrepesca, resiliencia, biodiversidad, sostenibilidad)
Conflictos	Externalidades de otros SES
Actividades de inversión	
Actividades de lobby	
Actividades de auto-organización	
Actividades de networking	
Monitoreo	
Evaluación	
Interacciones de gobernanza en el Marco de Evaluación de la Gobernabilidad	
Hechos	Medidas
Presencia y cualidad de interacciones	Compartir información, co-aprendizaje, adaptación
Función habilitadora y restrictiva de las relaciones de poder	Inclusividad, representatividad, participación

Fuente: Elaboración propia a partir de McGinnis y Ostrom (2014) y Chuenpagdee y Jentoft (2015).

En ambos marcos se puede observar que las interacciones ocupan un lugar destacado dentro del análisis institucional de la gobernanza y, además, aportan un carácter dinámico al sistema analizado. Las diferentes variables del sistema influyen en la actuación de un determinado actor y/o usuario, restringiendo las acciones que este puede realizar. Estudiando las interacciones de gobernanza se puede identificar qué variables afectan más a la acción y en qué medida, haciendo posible centrar la mejora de la gestión en los problemas más destacados.

3. CASO DE ESTUDIO: LAS COFRADÍAS DE PESCADORES DENTRO DE LA PESCA A PEQUEÑA ESCALA DE GALICIA

Las cofradías de pescadores son las principales organizaciones representativas de los pescadores a pequeña escala y mariscadores de Galicia. Su tradición asociativa proviene de épocas pasadas y han evolucionado a través de procesos adaptativos hasta su actual configuración como corporación de derecho público (García-Lorenzo et al, 2019). Son reconocidas por el marco legislativo autonómico y estatal y se les atribuye un papel importante en el sector pesquero con funciones propias de la Administración Pública (Gobierno de España, 1978, 2001; Xunta de Galicia, 1993, 2008, 2014).

En Galicia hay 63 cofradías con un total de 12.734 miembros (Federación Galega CP, 2017). Aunque existe bastante diversidad, la mayoría tienen un tamaño similar a la pequeña empresa. Estas organizaciones realizan su actividad sobre recursos naturales marinos, generalmente combinando pesca y marisqueo, y pueden desarrollar labores de producción y comercialización, entre otras. Combinado con su carácter público, que ha sido el objeto de análisis de la mayoría de los estudios previos realizados sobre las cofradías, estas también tienen objetivos empresariales o privados. En este sentido, las cofradías desarrollan una actividad empresarial gestionada de forma autónoma por sus miembros. Se trata por tanto de entidades asociativas con características y naturaleza público-privada, donde los miembros comparten y se benefician del uso y la explotación de los recursos marinos (Astorkiza et al, 2018; García-Lorenzo et al, 2018, 2019).

Este doble carácter público-privado, donde no siempre es posible separar ambos aspectos, hace que las cofradías tengan una estructura organizativa distintiva y las sitúa con como entidades híbridas (Williamson, 2007; Mc Ginnis, Ostrom, 2014; Jentoft y Chuenpagdee, 2015). Su consideración como entidades de Economía Social (Cervera, 2010; Gobierno de España, 2011; Xunta de Galicia, 2016), paralelamente a su definición de corporación de derecho público, refuerza este carácter mixto.

Desde una perspectiva de análisis institucional, múltiples aspectos de las estrategias de las cofradías han sido analizados en diferentes contextos (Freire y García-Allut, 2000; Taboada 2004; Mahou, 2008; Caballero et al, 2008, 2009, 2014; Fernández-Vidal y Muiño, 2014; Alló y Loureiro, 2017; Ballesteros, 2018, García-Lorenzo et al, 2018, 2019). Con la finalidad de presentar una visión general sobre sus características institucionales más relevantes para este caso de estudio, el Cuadro 2 sitúa a las cofradías de pescadores dentro del marco del sistema socio-ecológico (Mc Ginnis y Ostrom 2014).

El sistema y unidades de recursos, o sistema natural a gobernar según la nomenclatura de Jentoft y Chuenpagdee, son los recursos marinos de algunas zonas de mar abierto (Caladero Nacional) o zonas de estuario (Rías), así como las especies sedentarias (moluscos, crustáceos) y aquellas que no lo son (los peces). Los recursos también pueden situarse dentro de áreas protegidas o reservas marinas, condicionando así su gestión y explotación (Fernández-Vidal y Muiño, 2014; Alló y Loureiro, 2017). En este escenario se observa una complejidad y singularidad en cuanto a el sistema de recursos sobre los que actúan las cofradías, que da lugar también a una significativa diversidad de procesos productivos, tipo de explotación, e incluso regulación y definición de derechos (García-Lorenzo et al, 2019).

Esta definición de derechos de propiedad de las cofradías se basa su presencia histórica, como asociaciones de pescadores provenientes de los siglos XII-XIII, y en el importante papel que les atribuye el actual marco legislativo estatal y autonómico. Aparece así un sistema de gobernanza entre diversas entidades (Unión Europea, Gobierno Español, Xunta de Galicia y entidades del sector) donde las cofradías participan en la extracción y gestión de los recursos y tienen derechos de representación y consulta en los procesos de definición y aplicación de la política pesquera (Taboada, 2004; González-Laxe, 2006; Caballero et al, 2014).

Cuadro 2. Las cofradías de pescadores como actores y usuarios dentro del sistema de la pesca a pequeña escala de Galicia

<p>Sistema de recursos</p> <p>Caladero Nacional</p> <p>Pesca aguas interiores</p> <p>Marisqueo a pie</p> <p>Marisqueo desde embarcación</p> <p>Reservas Marinas</p>	<p>Situaciones de acción dentro de las cofradías de pescadores de Galicia</p> <p>Gestión</p> <p>Producción: siembra, selección de especies, extracción, calendario, estrategia estaciona y diaria</p> <p>Comercialización: sistema de almacenamiento y transporte, cambios en lonja y métodos de venta, estrategia de compradores</p> <p>Asistencia social e igualdad: medidas de cohesión, medidas de igualdad</p> <p>Actividad de Inversión: organización, infraestructuras, equipos, formación</p> <p>Otras actividades no pesqueras</p> <p>Información</p> <p>Cadenas de transmisión de información: con el sector público y privado</p> <p>Tratamiento de la información: cambios en equipos físicos y en medios humanos</p> <p>Niveles de información: autonómico, estatal, comunitario y Otros</p> <p>Procesos de decisión</p> <p>Sistema de deliberación y acuerdos</p> <p>Niveles potenciales de conflictos: internos y externos</p> <p>Actividad de auto organización</p> <p>Vigilancia y Control</p> <p>Participación en el sistema público</p> <p>Sistemas internos de autocontrol</p> <p>Relaciones Externas</p> <p>Representación de las Cofradías: sistemas de elección y participación</p> <p>Estrategias de relaciones externas</p> <p>Instancias de participación: Sector público, sector privado, ONGs, GACs</p>	<p>Sistemas de gobernanza</p> <p>Co-gestión</p> <p>Entidades</p> <p>Unión Europea, Estado Español, CC.AA., OOPP, Asociaciones de Armadores, Cofradías</p> <p>Instrumentos</p> <p>TAC's y cuotas</p> <p>Licencias y control de outputs</p> <p>Permiso individual miembros cofradías</p> <p>Permiso de explotación por embarcación: titulares miembros cofradías</p>
<p>Unidades de recurso</p> <p>Pesqueros</p> <p>Merluza, Sardina, Jurel, Caballa, Bonito del Norte, etc.</p> <p>Marisqueros y recursos específicos</p> <p>Pulpo, Almejas, Berberecho, percebe, erizo, oreja, algas, etc.</p>		<p>Actores</p> <p>Cofradías</p> <p>Pescadores</p> <p>Mariscadores</p> <p>Unión Europea</p> <p>Estado Español</p> <p>Xunta de Galicia</p> <p>Ayuntamientos</p> <p>OOPP</p> <p>Asociaciones de Armadores</p> <p>ONGs</p> <p>Otras organizaciones no pesqueras</p>

Fuente: Elaboración propia a partir de McGinnis y Ostrom (2014) y García-Lorenzo et al (2018, 2019).

En este contexto, en la gobernanza de los recursos pesqueros de Galicia, las cofradías de pescadores se sitúan como órganos que hacen las reglas y conjunto de actores que deben cumplirlas. La gestión conjunta de recursos entre administración y cofradías determina un sistema de co-gobernanza institucional, basado en la legislación y normativa, que se afecta a actividades como la producción, la vigilancia o la protección medioambiental. Este marco de co-gobernanza permite a las cofradías no solo

participar en la creación de las normas comunes, sino que, actuando como usuario de los recursos, realizar una auto-organización en los aspectos operacionales. Esta doble posición de las cofradías y sus características como actores van a influir en las estrategias que acaten, siendo las propiedades del sistema relevantes para la creación de las condiciones adecuadas para el autogobierno y la auto-organización (Jentoft y Chuenphangee, 2015).

Las actividades y estrategias que desarrollan las cofradías se pueden enmarcar dentro de las situaciones de acción del marco del SES. Esta perspectiva facilita el análisis de la influencia de las variables del sistema en sus actuaciones. En este contexto, este trabajo busca avanzar en el estudio de las características de las cofradías de pescadores como agentes de gobernanza, en concreto, en las interacciones y situaciones de acción que en ellas se producen. Determinar en mayor profundidad cómo se comportan las cofradías de pescadores y cuál es su percepción de los principales problemas del sector puede mejorar las futuras políticas y normativas sobre la gestión de la pesca a pequeña escala. Así, el análisis se centra en las estrategias frente a las actividades que desarrollan, la valoración de los conflictos con otros actores de gobernanza y la influencia de diferentes aspectos de la normativa autonómica, estatal y europea en la organización de las cofradías.

El caso de estudio abarca 15 cofradías de pescadores de Galicia, distribuidas a lo largo de las tres provincias costeras y los diferentes sectores. Para el análisis de datos se ha dividido a las cofradías en dos grandes grupos, las que desarrollan actividades principalmente marisqueras o principalmente pesqueras. La mayoría de las cofradías del estudio combinan ambas actividades, sin embargo, de forma habitual una tiene mayor peso dentro de la organización. De esta forma se busca analizar las diferencias de comportamiento entre estos grupos y, en la medida de lo posible, las diferencias geográficas que puedan existir.

Las percepciones de las cofradías se centran en el periodo de “los últimos 10 años” y en la perspectiva de los gestores de la organización (Patrones/Patronas Mayores; Secretario/a o; Asistencia Técnica). Todos los datos presentados en estos resultados fueron respondidos, como mínimo, por un 73,3% de las cofradías de estudio, obteniéndose el 100% de respuestas en más de la mitad de las preguntas. En determinadas preguntas consideradas relevante para el estudio, pero con menor ratio de repuestas, se especifica en el texto dicho porcentaje.

El estudio emplea el marco del sistema socio-ecológico, el marco de evaluación de la gobernabilidad y las actividades que realizan las cofradías para seleccionar qué variables de las interacciones de gobernanza son analizadas. Las preguntas presentan una escala de valoración entre el 1 y el 5 (completamente en desacuerdo; completamente de acuerdo).

4. RESULTADOS DEL CASO DE ESTUDIO

Los resultados se presentan en cuatro secciones: el apartado 4.1. presenta cuestiones generales sobre los resultados económicos y medioambientales; el 4.2. analiza la gestión de las actividades de producción, comercialización y otras actividades; el 4.3. se centra en las relaciones con la Administración Pública y la Sociedad; y el 4.4. en las valoraciones sobre la acción pública.

4.1. RESULTADOS ECONÓMICOS Y MEDIOAMBIENTALES

En general, las cofradías consideran que los **resultados económicos** de los miembros de las cofradías de pescadores son adecuados (3,93), obteniendo mejores resultados las cofradías marisqueras (4,38). Un 60% de las cofradías consideran los resultados adecuados o muy adecuados, la mayoría de las marisqueras y cerca de la mitad de las pesqueras. Los peores resultados se concentran en el norte y noroeste. Las de peores resultados dicen que, por ejemplo, el marisqueo a flote tiene muchos gastos, o que la explotación de recursos específicos no da grandes beneficios. Hay una idea general de que el marisqueo, dado que muchas veces es una actividad complementaria, da muy buenos resultados por las horas trabajadas (jornadas y estacionalidades), que es una actividad rentable.

Respecto a las cuestiones económicas de la cofradía, estas consideran que sí ha habido caídas en la producción (3,67) y en los precios (3,21), ambos resultados presentan valores muy dispersos. Sobre los cambios de estrategia por motivos económicos, se perciben grandes cambios (3,93), principalmente en las marisqueras (4,38), y se aprecian menores dispersiones. Las nuevas estrategias destacadas son búsqueda de comercializadores y compradores; la introducción de nuevas tecnologías como las apps comentadas en la gestión de la comercialización; establecimientos de precios mínimos y temporalidad; y la creación de nuevas marcas.

Las cofradías están más o menos de acuerdo con la afirmación de “en general, la **situación de los recursos pesqueros** es adecuada” (3,29), percibiendo las cofradías pesqueras una situación ligeramente mejor (3,57). Solo el 28,6% consideran los recursos han empeorado bastante y se aprecia mucha dispersión a lo largo de la geografía y tanto en las marisqueras como en las pesqueras. La mayoría de las cofradías consideran que la acción humana sobre el recurso (pesca) ha influido (3,55)

tanto como la acción humana sobre el medioambiente (3,73) en el empeoramiento de los recursos. Sin embargo, las cofradías marisqueras opinan la acción sobre el medio ambiente tiene mayor impacto, mientras que las pesqueras dan mayor peso a la acción directa sobre el recurso. Las principales acciones destacadas como más influyentes en el recurso son: la sobreexplotación; el arte del arrastre; el furtivismo; la contaminación de las aguas y los vertidos; la industria adyacente como centrales eléctricas y embalses; y la contaminación por especies invasoras, virus y bacterias.

Las cofradías consideran correcta la **aplicación de la normativa ambiental** (3,71), la mayoría de las cofradías varían entre algo de acuerdo (3) y completamente de acuerdo (5), habiendo poca dispersión. Alguna cofradía destaca que la definición es muy adecuada, pero no así su aplicación. En el caso de la correcta definición y aplicación de las Áreas Marinas Protegidas, solamente han respondido las cofradías que faenan o tiene alguna vinculación con ellas, un 66,7% del caso de estudio, y consideran muy correcta su definición (4), excepto en un caso en concreto que no la percibe nada adecuada. Contradictoriamente, esta cofradía es una de las dos del estudio que tiene una AMP directamente vinculada. Los problemas que aparecen son que la definición debería ser más integral y que las responsabilidades de las cofradías no están bien delimitadas.

Todas las cofradías consideran que no tienen ninguna capacidad de actuación importante en catástrofes e incidencias ambientales (1,6), no habiendo ninguna acción que ellas puedan hacer contra problemas de grandes dimensiones. Solo un 13,3% percibe grandes capacidades de actuación.

Por último, las cofradías no están demasiado de acuerdo con que **las AA.PP. aplican las normas a todos por igual y en todos los casos** (2,87). Aun así, se aprecia una mayor conformidad en Pontevedra (3,57) y menor en A Coruña (2) y se destaca que algunas normas son ambiguas.

4.2. GESTIÓN DE LAS ACTIVIDADES DE LA PRODUCCIÓN, COMERCIALIZACIÓN Y AUTO-ORGANIZACIÓN

Para analizar las percepciones en las estrategias de gestión y en la auto-organización, se ha tratado de recoger la valoración del grado de intensidad o la importancia de los cambios en la actuación o estrategia en la gestión de: la producción; la comercialización; otras actividades; asistencia social e igualdad; y en materia de organización y funcionamiento interno.

En relación a la **gestión de la producción**, los principales cambios en las cofradías pesqueras y marisqueras fueron en los topes de capturas por día/mes (3,73). Se destacan los cambios en los topes de pulpo y caballa y la mayor auto-regulación, variando los topes de un mes a otro en función del precio de mercado. Los cambios en la introducción de nuevos instrumentos, aparejos y equipos, ha sido importantes en el caso de las cofradías pesqueras (4), mientras que para el sector marisquero la mayoría de las cofradías no percibieron cambios o estos fueron pequeños (2,13). En general, los cambios más destacados son: mejoras en los equipos de pesca (GPS), equipos informáticos, el traje de neopreno para los mariscadores, un localizador (AIS) para los barcos que faenan en reservas marinas y motores para oxigenar la tierra en la regeneración de bancos marisqueros.

Por el contrario, las cofradías marisqueras perciben mayores cambios en la introducción de nuevas especies objetivo (3,50) que las pesqueras (1,86). El erizo, el longueirón, la anémona, el crecimiento de la almeja japónica frente a la fina y la introducción de las algas y la oreja de mar son las especies mencionadas. También se aprecia un problema con las especies invasoras en los casos de marisqueo, especialmente para la siembra y regeneración de bancos.

En relación al calendario anual de vedas/ paros biológicos, ninguno de los sectores percibe cambios importantes (2,33). De hecho, la mitad de las cofradías no aprecian ningún cambio (1), y solo un 33,3% destacan cambios importantes o muy importantes. Estos cambios se centran en la veda del pulpo y los cambios en la organización del calendario anual. Antes había un periodo de vedas y otro de capturas y ahora, en algunos casos, se intenta extraer el recurso durante más tiempo, pero con un carácter más rotativo por zonas. En varios casos se expone que actualmente en el marisqueo a flote, se coge menos cantidad de individuos pero estos más grandes, debido a una mayor concienciación.

Los cambios en la asignación de usos y espacios para faenar son los menores cambios reconocidos en toda la **gestión de la producción**. Especialmente en las cofradías pesqueras (1,29), no se aprecia ningún cambio excepto en un caso en concreto. Para las cofradías marisqueras (2,13), la mitad no perciben ningún cambio y la otra mitad aprecian cambios tanto poco como muy importantes. En general, los espacios para faenar resaltan ser "los mismos de siempre", y en el marisqueo hay nuevos espacios para la regeneración de bancos y fangos, en algunos casos debido al rellenando la ría.

Los cambios en las lonjas y sus métodos de venta han sido los más relevantes en la gestión de la comercialización, de forma similar para ambos sectores (3,71). Los principales ressaltados fueron:

cambios en las infraestructuras de la lonja como nuevos edificios, visualización en pantallas o mandos; nuevas formas de subasta (a la baja, a la holandesa); cambio de subastas tradicionales a precios concertados en algunas especies como el erizo o el pulpo; cambio de la venta diaria a semanal, donde se subasta una vez y el comprador se lleva toda la semana de lunes a viernes; introducción de comerciales que compraban en nombre de otros (la experiencia no fue bien y lo dejaron, el personal de la lonja no colaboraba); e introducción de clasificadoras en el marisqueo para ajustar precios y calidades (la clasificación para la babosa fue una gran mejora, menos trabajo y más precisión, ahora buscan financiación para tener clasificadores para otras especies). En muchos casos se menciona el cambio de la subasta a voz a subasta informática, pero fue hacia el 2000. Los mayores cambios, se encuentran en las cofradías entre Cabo Finisterre y la vertiente norte de la Ría de Vigo.

En relación a las otras variables que pueden influir en la comercialización, en las cofradías se percibe que tanto la introducción de nuevas tecnologías (2,86), como el sistema de almacenamiento y el transporte de los compradores (2,73) y sus estrategias de compra (2,64) han influido relativamente en las estrategias. Sobre la introducción de nuevas tecnologías de comercialización, se aprecia una relación entre éstas y los métodos de venta, destacándose los cambios informáticos relacionados con internet y aparataje (puestos de pesaje, uso del móvil en lugar de mandos) y la introducción de apps para la venta de algunas especies o de nuevas experiencias como para la venta de pulpo.

Sobre los compradores, solo se destacan, como cambios en sistema de almacenamiento y transporte, las nuevas cajas, envases individuales o cajones isotérmicos y los “puestos de control” del marisqueo”. Aquí algunos entrevistados tuvieron confusión entre los compradores e intermediarios, diciendo que influyeron más los cambios en intermediarios. La percepción de las cofradías sobre los cambios en la estrategia de los compradores se centra en los intentos por la implementación de la venta on-line, la inclusión de nuevos comerciales, las clasificadoras de mariscos que permiten más agilidad y rapidez y, sobre todo, en la mayor relevancia y poder de negociación de algunos compradores en determinadas cofradías y especies.

En estudios anteriores sobre las cofradías (la participación de los miembros en las cofradías de pescadores) se había destacado que las cofradías llevan a cabo otras funciones más allá de la producción y la comercialización que revierten en la sociedad y en su entorno más cercano. Entre ellas se encontraban aquellas complementarias de su actividad habitual (depuradoras; fábricas de hielo; criaderos), el turismo (principalmente turismo marino), la colaboración en actividades de sociales (clubes deportivos de natación, remo y vela entre otros; fiestas patronales del pueblo o ciudad; visitas de colegios) y la conservación del patrimonio histórico y cultural (fundaciones culturales; museos del mar; promoción de productos de reservas marinas). Sin embargo, la percepción de las cofradías es que no ha habido cambios importantes en estas otras actividades (2,33) de hecho, muchas cofradías prefirieron no responder a esta cuestión y solo se obtuvo el 60% de respuestas. En general, no recuerdan los cambios o no saben destacarlos y solo el 13,3% de las cofradías perciben cambios importantes, como la asunción de nuevas funciones de limpieza, envasado y empaquetado de algunas especies o la construcción/creación de depuradoras propias. Las experiencias de turismo marino son mencionadas habitualmente, pero en la mayoría de los casos no obtuvieron buenos resultados y se abandonaron.

Casi un 77% de las cofradías no perciben cambios ni en su actuación ni es su estrategia en la **organización y funcionamiento interno**. Por el contrario, las que sí lo perciben destacan cambios importantes o muy importantes.

En relación a la pregunta sobre cambios importantes en la asistencia social las cofradías opinan que casi no ha habido cambios (2), salvo que una cofradía pesquera ha percibido grandes cambios. En general, las cofradías asocian los cambios en la asistencia social al período anterior, hace más de 10 años. Sobre los cambios en **igualdad y género** las cofradías perciben ligeramente mayores cambios (2,58). En los dos casos las cifras son muy similares para ambos sectores, pero se aprecia una gran dispersión en las respuestas, donde el 42% de cofradías no perciben ningún cambio, otro 42% algunos cambios y un 17% destacan cambios muy importantes.

A la afirmación de “considera que, en general, la asistencia social y política de igualdad es adecuada” las cofradías estuvieron muy de acuerdo (3,71), especialmente las pesqueras (4). La principal causa de esta diferencia son el 14,3% de las cofradías, todas marisqueras, que están en completo desacuerdo o muy desacuerdo (1 y 2) por problemas concretos con la igualdad.

4.3. RELACIÓN CON LAS ADMINISTRACIONES Y LA SOCIEDAD

Las relaciones con la Administración Pública y con otras entidades de la sociedad condicionan la participación en la información y los procesos de decisión de las cofradías. Por ello, en este apartado se analizan las disposiciones/normativas/actuaciones políticas que hayan obligado a cambios o influido de manera importante en la dinámica de la cofradía. Dado el reparto de competencias entre el Estado y las Autonomías, el análisis diferencia entre múltiples administraciones públicas.

En relación con las **políticas de la Unión Europea** las cofradías consideran que han sufrido cambios muy importantes (4,53) debido a estas políticas. En concreto se destacan: TACs y cuotas; las normativas sobre medidas de seguridad y sanidad a bordo; y la regulación de la potencia de los motores, que en las costas gallegas muchas veces se tiene por motivos de seguridad y no de capacidad de pesca. Algunas también han comentado que cada vez les supone más carga de trabajo y que trabajan para la AA.PP. La influencia fue mayor en las cofradías pesqueras (5), probablemente debido a competencias pesqueras de la Unión Europea.

Las **políticas del Estado Español** han influido menos en las actuaciones de las cofradías que las europeas (3,67), y aquí las cofradías marisqueras las consideran más condicionantes (4). Se destacan las medidas relacionadas con la seguridad; la sobredimensión de leyes preparadas para embarcaciones más grandes o actividades mayores y las cuales son demasiado exigentes para el marisqueo y la pesca a pequeña escala; la normativa sobre el buceo; y la interlocución con terceros países.

La percepción dominante es que las **políticas de la Xunta de Galicia** son las que menos han influido en las dinámicas de las cofradías (3), y por igual en las cofradías pesqueras y marisqueras. Se destacan: la ley de Pesca de Galicia; el intento de la nueva ley de Acuicultura; la regulación de las semillas en el marisqueo; el plan de gestión del pulpo; la necesidad de simplificar los decretos de pesca sobre aparejos; la caracterización de las artes menores; y la inacción de la Xunta en determinadas normativas estatales y europeas que iban en contra del sector en Galicia.

La influencia de las **actuaciones políticas o sociales de otros estamentos o grupos sociales/políticos (Concello, ONGs, GACs...)** en las cofradías es intermedia (3,10). Entre las actuaciones destacadas se encuentran: una clasificadora de pulpo; las actuaciones de grupos ecologista; la colocación de contenedores exclusivos para las cofradías; y la colaboración de los GAC en la mejora de instalaciones de la lonja (básculas, cierres automáticos, cajas...). Un 33,3% de las cofradías prefirieron no responder a esta cuestión, de entre quien sí lo hicieron, dispersión es muy alta en las cofradías pesqueras y marisqueras. Se aprecia una mayor dificultad por valorar esta preguntar, muchos de los casos de la no influencia es la escasa relación o que los cambios en la dinámica de la cofradía no fueron importantes.

En la influencia de las políticas del Estado Español, la Xunta de Galicia y otros estamentos, los peores resultados se concentran en A Coruña, entre la Ría de Betanzos y la vertiente norte de la Ría de Arousa.

Para la afirmación: “considera que, en general, las relaciones con las AA.PP. son adecuadas” las cofradías están bastante de acuerdo (3,33). Los valores no tienen demasiada dispersión, un 80% de las cofradías aprecia buenas relaciones o muy buenas relaciones y solo el 20% tienen problemas específicos con la Administración. Por otro lado, en la afirmación “considera que, en general, las formas de representación, información y diálogo con las AA.PP. son adecuadas” las cofradías están muy de acuerdo (4,2), y un 73,3% las consideran completamente adecuadas. Solo un 6,7% consideran que no son nada adecuadas. Sin embargo, las cofradías no creen que “en general, las formas de representación, información y diálogo con las AA.PP. sean efectivas” (2,75). El 33,3% de las cofradías sí las consideran adecuadas, pero estas destacan que llevan poco tiempo desde la reapertura o que la relación ha mejorado mucho en los últimos tiempos. Entre las críticas a las AA.PP. es que se incumplen los planes de gestión o la excesiva burocracia. Los mejores resultados de las relaciones con la Administración se obtienen entre Fisterra y Noia, y después entre Aguiño y Portonovo.

El 60% de las cofradías están muy de acuerdo con la afirmación de “considera que, en general, la **relación con otros grupos sociales** (por eje.: ONGs ecologistas, comercializadores), políticos es adecuada” (4,67). Este dato obtuvo menor número de respuestas ya que la mayoría de las cofradías de A Coruña prefirieron no responder porque no perciben ninguna relación destacable. Sin embargo, si se trata de “considera que la **vinculación de la cofradía con su entorno cercano** (localidad, Concello) es adecuada” las cofradías están un poco menos de acuerdo, (3,80) pero todas respondieron. En este caso se aprecia una gran diferencia ente las cofradías marisqueras (3,13) y las pesqueras (4,57). Algunas cofradías destacan que los lazos con el entorno, especialmente con el ayuntamiento, son muy fuertes.

En relación a si “ha habido **conflictos importantes entre la cofradía y las diferentes instancias**”, los resultados son muy variados, llegando a haber un 26,67% de las cofradías, todas ellas pesqueras y del norte y noroeste de Galicia, que dicen no tener ningún conflicto importante con ninguna institución ni organización (1 en todas las categorías). En general las cofradías pesqueras apenas muestran conflictos con entidades de su entorno, a excepción de los conflictos con las Administraciones Públicas (UE, EE y Xunta de Galicia) que se destacan muy importantes en el 33,3% de ellas.

Los conflictos con la UE son escasos (1,93), al igual que con el Estado Español (2,27), afirmando casi todas las cofradías no casi tener conflictos (1) salvo entre el 20% que destacan conflictos importantes con ambas instancias (5). A nivel europeo se presentan problemas con el cerco, con la normativa de descartes, las artes a la deriva y la caracterización de las “artes de xeito”, mientras que a nivel estatal son

fuentes de conflicto la relación con la Secretaría General de Pesca y los problemas de la potencia y el motor de las embarcaciones.

Los conflictos con la Xunta de Galicia son los más importantes (3,13), especialmente en el caso del marisqueo (3,5). Los planes de gestión, el cerco, el anteproyecto de ley de Acuicultura, las normativas para la extracción de recursos y la regeneración de bancos son los casos destacados.

Los conflictos con otras cofradías o grupos de pescadores (1,93), con el sector comercializador (1,8), con sectores no directamente pesqueros (1,53) y con otros grupos sociales (1,4) son, en general, muy pequeños. En casi todos los casos se trataban de asuntos concretos como: el convenio de buena vecindad con Portugal; problemas con las depuradoras del ayuntamiento o fábricas; el poder de los compradores que se aúnan para fijar precios; o los conflictos de espacio con otros sectores. Las cofradías de marisqueo consideran que existen más conflictos que las pesqueras, pero siguen siendo valores muy bajos.

Sobre las relaciones internas, las cofradías consideran que, en general, “la **convivencia interna** en la CP es adecuada” (4), especialmente en las pesqueras, y habiendo poca dispersión, un 85,7% están muy de acuerdo o completamente de acuerdo en ellas. Sobre “**el grado de cumplimiento de las normas por parte de los pescadores/mariscadores**” las cofradías consideran que es adecuado (3,07) pero mejorable, habiendo muy poca diferencia entre las cofradías de marisqueo y de pesca y poca dispersión, salvo un 26,7% de casos extremos.

En las cofradías consideran que casi no “hubo **conflictos internos** relacionados con estos factores”: diferencias de edad (1,6), diferencias de género (1,67); diferencias por intereses económicos (1,6); diferencias por posiciones ideológicas (1,6) y algunos conflictos debidos a las diferencias por grupos de actividad (2,29). Los conflictos surgen casi exclusivamente en las marisqueras, ya que en el 66,7% de las pesqueras no ha habido conflictos internos por ningún motivo y en 33,3% si hay conflictos, son muy pequeños. En los conflictos de género se destacan problemas en los órganos rectores y en los grupos de actividad se mencionan conflictos habituales, pero no graves, propios de la convivencia de los sectores. En general, los problemas que se destacan son problemas específicos de un momento o situación concretos.

En relación a la afirmación de “considera muy importante el **liderazgo** (personas que asuman la dirección) en la Cofradía”, la mayoría de las cofradías están muy de acuerdo (4,47), principalmente en las cofradías marisqueras. La principal diferencia son un 13,3% de los casos, todos pesqueros y de la zona de A Coruña, que perciben más importante la idea de grupo (si funcionan bien como grupo cualquier líder valdría) y destacan la necesidad de implicar a todos los pescadores y mariscadores en la organización. Se destaca que las agrupaciones son clave, debe haber relevos de mando y es importante tener un líder, representante, pero los miembros no pueden delegar todo en él, deben asumir responsabilidades.

4.4. VALORACIÓN DE LA ACCIÓN PÚBLICA

En este apartado se recogen las valoraciones de las cofradías sobre diversas normativas de las Administraciones Públicas y su adecuación a la actividad que regulan. La opinión de las cofradías coincide fuertemente en algunas normativas, destacando problemas generales para el sector, mientras que en otras existe una mayor dispersión en los resultados.

La normativa con la percepción más positiva por parte de las cofradías es la normativa de jornada laboral y descanso semanal, la cual consideran muy adecuada en general (4,67), e incluso completamente adecuada en las pesqueras (5). Aun así, indican que es mejorable en sentidos opuestos. Algunas de las cofradías pesqueras opinan que si de lunes a viernes no fuese posible salir por las condiciones meteorológicas y el fin de semana sí, deberían tener esa opción, mientras que las marisqueras optan por ampliar la jornada de descanso a los viernes e indican que en estos descansos las artes tendrían que volver a tierra.

La percepción general de las cofradías es la **conformidad con la mayoría de normativas**. De esta forma, consideran bastante adecuado: el sistema de autorizaciones y permisos de marisqueo (3,64); la definición de Planes de Explotación y Planes Experimentales (3,64); el sistema de comercialización en la primera venta (3,64); el sistema de entrada y registro de embarcaciones (3,5); y la definición de medidas de seguridad y habitabilidad a bordo (3,47). En todos los casos, las cofradías pesqueras perciben ligeramente mejor estas normativas, y solo entre el 14,3% y el 21,4% de las cofradías aprecian una tendencia contraria a la general. Una crítica general mencionada por la mayoría de las organizaciones es la sobredimensión de las medidas y los trámites requeridos, tanto a la organización como a los pescadores y mariscadores. Los principales problemas detectados son: falta de agilidad de los sistemas; necesidad de que exista un registro especial de embarcaciones de pesca de bajura; situaciones específicas donde no se cubren las plazas de marisqueo; mal funcionamiento e incumplimiento de Planes de Gestión, principalmente de los planes conjuntos y; la variedad de lonjas existentes, se presenta que debería ser de forma cooperativa entre las lonjas, con una Central Venta

Única.

Otras normativas que las cofradías perciben como relativamente adecuadas son el sistema de alternancia de artes y su regulación (3,21), la definición autonómica de órganos de consulta y colaboración y su funcionamiento (3,14) y, en menor medida, el sistema de formación profesional en el ámbito pesquero (2,80). Al contrario que en la situación anterior, las cofradías marisqueras perciben estas actuaciones más positivamente que las pesqueras y existe mayor dispersión en las opiniones. En relación a las artes de pesca y la formación, las críticas se centran en la necesidad de una mayor flexibilidad en las artes según las circunstancias locales (como cupos o condiciones meteorológicas), en el exceso de requisitos formativos y en la inexistencia de parte práctica en la formación. Sobre los órganos representativos hay gran diversidad de opiniones, pero se percibe que podría ser mejorable si: hubiese obligatoriedad de participación de los miembros alguna vez en la vida; las listas fuesen ser cerradas; los requerimientos fuesen menores para la cofradías más pequeñas (llegándose a proponer que con un representante valdría); y si hubiese personal técnico en su composición de los órganos.

Por el otro lado, **las cofradías no están conformes** con determinadas actuaciones como la regulación del furtivismo (1,86), los sistemas de vigilancia, control y sanciones a los pescadores (1,93) o la dotación por parte de las Administraciones Públicas de infraestructuras (2,6). Del mismo modo, y concordando con las valoraciones anteriores, las cofradías no perciben que haya infraestructuras públicas infrautilizadas (2,07). La valoración de todas estas normativas es ligeramente menor en el caso de las cofradías marisqueras, especialmente en el furtivismo (1,26), y no existe demasiada dispersión, variando entre 6,7% y el 20% los casos que indican una tendencia contraria a la general. Los problemas destacan son: la falta de control y la compleja regulación del furtivismo; el furtivismo interno; la falta de personal y de guardacostas; el exceso de requisitos; y la mala valoración de las sanciones, donde las más importantes son las menos costosas (como en el furtivismo) y viceversa.

5. CONCLUSIONES

El análisis del caso de estudio muestra una fuerte identificación de los gestores con su organización, las cofradías de pescadores. Este hecho se refleja en la satisfacción general con los resultados propios, tanto económicos como sociales.

Los beneficios económicos que reciben los pescadores y mariscadores se perciben como muy adecuados, especialmente en el sector marisquero, y los conflictos de la cofradía, tanto internos como con las entidades de su entorno, como muy pequeños y centrados en casos específicos. La convivencia interna, el liderazgo, la asistencia social y política de igualdad se valoran de forma muy positiva y homogénea en casi todos los casos estudiados, mientras que el grado de cumplimiento de las normas por parte de los pescadores y mariscadores se considera mejorable.

La situación de los recursos pesqueros refleja percepciones diferentes según cofradías, pero se aprecia una visión general de adecuación. Existe una mayor concordancia entre las organizaciones en considerar que la acción humana sobre el recurso y sobre el medioambiente influye, en mayor o menor medida, en la situación de estos recursos y que ellas no tienen ninguna capacidad de actuación importante en catástrofes e incidencias ambientales. Del mismo modo, consideran correcta la aplicación de la normativa ambiental y la definición y aplicación de Áreas Marinas Protegidas.

La percepción general en las cofradías es la conformidad con las medidas y normativas administrativas que afectan a su normal funcionamiento, especialmente como aquellas relativas a la jornada laboral y descanso semanal. Sin embargo, hay una fuerte identificación de determinados problemas, como el furtivismo, los sistemas de vigilancia, control y sanciones y la falta en la dotación de infraestructuras.

Más allá de las percepciones generales y compartidas, existe una amplia diversidad en la valoración de determinados aspectos, principalmente aquellos relacionados con la gestión de la producción y la comercialización y con la influencia de las políticas de las Administraciones Públicas. Esto parece compatible con los impactos y las situaciones diferentes que pueden vivirse en cada cofradía y con la mayor incidencia del corto plazo en las percepciones.

Las tendencias más homogéneas son que los principales cambios en la producción se deben a los toques de capturas por día/mes y en la comercialización a las mejoras en las lonjas y sus métodos de venta. En las políticas públicas, la Unión Europea es aquella que más influye en la actuación de las cofradías y las relaciones con todas las administraciones son relativamente adecuadas, pero se percibe que estas no siempre aplican las normas a todos por igual y en todos los casos.

En el análisis de la variabilidad del caso de estudio, parece apreciarse una tendencia diferente entre regiones. La región norte y noroeste, y en algunos casos el conjunto de la provincia de A Coruña, percibe menores cambios en la producción y la comercialización, así como menor influencia de las políticas del Estado Español, la Xunta de Galicia y otros estamentos. También se refleja una mayor disconformidad con determinadas medidas administrativas, peores resultados económicos y se percibe una menor igualdad por parte de las AA.PP. en la aplicación de sus normas.

Por último, se presentan determinadas diferencias entre el sector pesquero y marisquero. Las cofradías marisqueras perciben mayores cambios productivos debido a nuevas especies y espacios y mayor influencia de las políticas del Estado Español que las pesqueras. También detectan ligeramente mayores conflictos y mayor disconformidad con las medidas mal valoradas, especialmente con el furtivismo. Por el otro lado, aprecian mejores resultados económicos y destacan mayores cambios de estrategias para adecuarse las condiciones del mercado, como variaciones de producción y precios.

REFERENCIAS

- ALLÓ, M.; LOUREIRO, M.L., 2017. The role of social norms on conservation programmes in shellfish fisheries, *Marine Policy* 84: 134-141.
- ANDERIES, J.M.; JANSSEN, M.A.; OSTROM, E., 2004. A framework to analyze the robustness of social- ecological systems from an institutional perspective. *Ecology and Society*, vol. 9, nº 1: 18.
- ASTORKIZA, K., DEL VALLE, I., 2018. An economic analysis of private side of fishermen's cofradías' activity on the Cantabrian Sea. *Marine Policy*, 90, 152-159.
- BALLESTEROS, M.A., 2018. Gobernanza policéntrica en sistemas socioecológicos complejos: la gestión de la pesquería del pulpo (*Octopus vulgaris*) en Galicia. Tesis Doctoral. Universidad de Vigo.
- BASURTO, X., GELCICH, S., OSTROM, E., 2013. The social-ecological system framework as a knowledge classificatory system for benthic small scale fisheries, *Global Environmental Change* 2013; 23: 1366- 1380.
- CABALLERO-MIGUEZ, G., GARZA-GIL, M.D., VARELA-LAFUENTE, M.M., 2008. "Institutions and Management of Fishing Resources: The governance of the Galician model". *Ocean & Coastal Management*, 51, 8-9, 625-631.
- CABALLERO-MIGUEZ, G., GARZA-GIL, M.D., VARELA-LAFUENTE, M.M., 2009, The institutional foundations of economic performance of mussel production: The Spanish case of the Galician floating raft culture, *Marine Policy*, 33, pp. 288-296.
- CABALLERO-MIGUEZ, G., VARELA-LAFUENTE, M.M., GARZA-GIL, M.D., 2014. "Institutional change, fishing rights and governance mechanisms. The dynamics of the Spanish 300 fleet on the Grand Sole fishing grounds", *Marine Policy*, 44, pp. 465-472
- CERVERA, A., 2010. Percepción cooperativa de las cofradías de pescadores: un estudio empírico. *REVESCO, Revista de Estudios Cooperativos*, 3°C, Nº 102, 7-32.
- FEDERACIÓN GALLEGA DE COFRADÍAS DE PESCADORES, 2017. Cofradías. <http://confrariasgalicia.org/> (accessed 22.06.17).
- FERNÁNDEZ-VIDAL; D., MUIÑO, R, 2014. Fact or fiction? Assessing governance and co-management of Marine Reserves of Fishing Interest in Cedeira and Lira (NW Spain), *Marine Policy*; 47:15-22.
- FREIRE, J, AND GARCIA-ALLUT, A., 2000. Socioeconomic and biological causes of management failures in European artisanal fisheries: the case of Galicia (NW Spain). *Marine Policy*; 24: 375-384.
- GARCÍA-LORENZO, I.; CABALEIRO-CASAL, M.J.; VARELA, M.M., 2018. The Cofradías de Pescadores in Galicia: study applied from the perspective of the participation firms. Communication in the VIII Conference of the Spanish-Portuguese Association of Natural Resources and Environment Economics. Madrid, 1- 5 September <https://edipress.com/conference/AERNAVII/program/AERNAVII.html>.
- GARCÍA-LORENZO, I., VARELA-LAFUENTE, M.M., GARZA-GIL, D., 2019. Adaptive processes in small-scale traditional fishermen's organisations. The case of Cofradías in Galicia (NW Spain). *Marine Policy*, 99, 382-390.
- GOBIERNO DE ESPAÑA, 1978. Real decreto 670/1978, de 11 de marzo, de Cofradías de Pescadores. BOE nº 87, de 12 de abril de 1978. <https://www.boe.es/boe/dias/1978/04/12/pdfs/A08439-08440.pdf>.
- GOBIERNO DE ESPAÑA, 2001. LEY 3/2001, de 26 de marzo, de Pesca Marítima del Estado. BOE nº 75, de 28 de marzo de 2001.
- GOBIERNO DE ESPAÑA, 2011. LEY 5/2011, de 29 de marzo, de Economía Social. BOE nº 76, de 30 de marzo de 2011.
- GONZÁLEZ-LAXE, F., 2006. Transferability of fishing rights: The Spanish case. *Marine Policy*, 30, 379-388.
- HUNT, L.M., SUTON, S.G., ARLINGHAUS R., 2013. Illustrating the critical role of human dimensions research for understanding and managing recreational fisheries within a social-ecological system framework. *Fisheries Management and Ecology*, 20, 111 – 124, <https://doi.org/10.1111/j.1365-2400.2012.00870.x>
- JANSSEN, M.A.; ANDERIES, J.M.; OSTROM, E., 2007. Robustness of social-ecological systems to spatial and temporal variability. *Society and Natural Resources*, vol. 20, nº 4, pp. 307-322
- JENTOFT, S., CHUENPAGDEE, R. (Eds.), 2015. Interactive governance for small-fisheries. *Global Reflections*. Centre for Maritime Research MARE. Springer Int. Pub. Switzerland.
- KISER, L.L.; OSTROM, E., 1982. The three worlds of action: a metatheoretical synthesis of institutional approaches. Pages 179-222 in E. Ostrom, editor. *Strategies of political inquiry*. Sage, Beverly Hills, California, USA.
- KOOIMAN, J.; BAVINCK, M., 2005. The governing perspective, in Kooiman, J. et al (eds.), *Fish for Life: Interactive Governance for Fisheries*, Amsterdam U.P.: 11-24.
- MAHOU LAGO, X.M., 2008. Implementación y gobernanza: La política del marisqueo en Galicia. *Escola Galega de Administración Pública*, Xunta de Galicia. ISBN: 978-84-453-4643-3.
- MC GINNIS, M.D., OSTROM, E., 2014. Social-ecological system framework: initial changes and continuing challenges.

Ecology and Society, 19 (2): 30.

NAGENDRA, H., OSTROM, E., 2014. Applying the social-ecological system framework to the diagnosis of urban lake commons in Bangalore, India. *Ecology and Society*, 19 (2), 67. <http://dx.doi.org/10.5751/ES-06582-190267>.

OSTROM, E., 1990. *Governing the commons. The evolution of institutions for collective action*. Cambridge University Press, Cambridge.

OSTROM, E., 2007. A diagnostic approach for going beyond panaceas. *Proceedings of the National Academy of Sciences*, vol. 104, 39: 15181-15187.

PARTELOW, S., 2015. Key steps for operationalizing social–ecological system framework research in small-scale fisheries: A heuristic conceptual approach. *Marine Policy*, 51: 507-511. <http://dx.doi.org/10.1016/j.marpol.2014.09.005>

RHODES, R. A., 1996. The new governance: Governing without government. *Political Studies*, XLIV: 652–667.

SCHLAGER, E., OSTROM, E., 1992. Property-rights regimes and natural resources: a conceptual analysis. *Land Economics* 68(3), 249-262.

TABOADA, M. S., 2004. El papel de las instituciones en el origen y en la evolución de la cofradía de pescadores gallega. Estudio de casos. Ed. Universidad de Santiago de Compostela

WILLIAMSON, O., 2007, An interview with Oliver Williamson, *Journal of Institutional Economics*, 3 (3), pp. 373-386.

XUNTA DE GALICIA, 1993. LEY 3/1993, de 8 de julio, de cofradías de pescadores de Galicia. DOG nº 134, de 13 de julio de 1993 y BOE nº 203, de 25 de agosto de 1993.

XUNTA DE GALICIA, 2008. LEY 11/2008, de 3 de diciembre, de pesca de Galicia. DOG nº 243, de 16 de diciembre de 2008 y BOE nº 15, de 17 de enero de 2009.

XUNTA DE GALICIA, 2014. DECRETO 8/2014, de 16 de enero, por el que se regulan las cofradías de pescadores de Galicia y a sus federaciones. DOG nº 19, de 29 de enero de 2014.

XUNTA DE GALICIA, 2016. LEY 6/2016, de 4 de mayo, de la economía social de Galicia. DOG nº 93, de 18 de mayo de 2016 y BOE nº 147, de 18 de junio de 2016.

LA MANCOMUNIDAD DE COMUNIDADES DE MONTES VECINALES EN MANO COMUN: FUSIÓN DE COMUNIDADES PARA AFRONTAR LOS RETOS DEL MONTE EN GALICIA

BEATRIZ ZUGAZAGOITIA RODRÍGUEZ

Programa de doctorado en análisis económico y estrategia empresarial/Universidade de Vigo
Campus Lagoas Marcosende s/n 36201 Vigo/beatriz@Zugazagoitia.com
e-mail Beatriz Zugazagoitia Rodríguez: beatriz@Zugazagoitia.com

Resumen

El monte es reconocido mundialmente, al margen de sus aspectos medioambientales, como un factor de desarrollo económico y social en el ámbito regional, creador de valor añadido contribuyendo a la creación y mantenimiento del empleo, especialmente en las zonas rurales, muchas veces regiones desfavorecidas estructuralmente.

Galicia cuenta con importantes recursos forestales cuya explotación está lastrada por la muy reducida dimensión de las propiedades en manos de un gran número de pequeños propietarios, muchas veces ya desconocidos. Cuenta además con el hándicap de una población cada vez más envejecida y el fenómeno del despoblamiento del rural.

Con estas consideraciones resulta procedente investigar y aportar soluciones de gestión que puedan llegar al monte gallego para permitirle desarrollar su potencial. En este sentido la existencia de las comunidades de montes vecinales en mano común supone un primer factor de agrupación de propietarios, si bien la realidad de muchas de ellas, principalmente por tamaño o por incapacidad de gestión, no permite desarrollar su potencialidad.

Este trabajo busca estudiar como la estructura de las Comunidades de Montes puede ayudar a mejorar la gestión de los territorios y ofrecer alternativas que dentro de estas figuras puedan incrementar el valor de los recursos forestales.

De acuerdo esos objetivos este trabajo lo pone una serie de alternativas que mejoren la capacidad de gestión de los recursos forestales de tal forma que se pueda obtener un mayor valor económico social y medioambiental de dicho recurso.

Palabras clave: Gestión Forestal, Comunidad de montes, Propiedad Forestal, Fusión, Bienes comunales.

Eje Temático 5 : Economía Ambiental y de Recursos Naturales no marinos

Abstract

Forest is recognized worldwide, regardless of its environmental aspects, as a factor of economic and social development at a regional level, in terms of added value contributing to the creation and maintenance of employment, especially in rural areas, often structurally disadvantaged regions.

Galicia has important forest resources whose exploitation is hindered by the very small size of the properties in the hands of a large number of small owners, often unknown. It also has the handicap of an increasingly aging population and the phenomenon of rural depopulation.

With these considerations it is appropriate to investigate and provide management solutions that can reach the Galician forest to enable it to develop its potential. In this sense, the existence communal forest private property is a first factor for the grouping of owners, although the reality of many of them, mainly due to their size or management incapacity, does not allow their potential to be developed.

This work seeks to study how the structure of the communal forest private property can help to improve the management of the territories and offer alternatives that within these figures can increase the value of forest resources.

According to these objectives, this work proposes some alternatives to improve the management capacity of forest resources in such a way that a greater social and environmental economic value of this resource can be obtained.

Keywords: Forest management, Common forest lands, Forest property, Fusion, Common property resource.

Thematic Area 5: Environmental Economy and Non-marine Natural Resources.

1. INTRODUCCIÓN

El bosque, o el monte, como nos referimos al él los gallegos, juega un papel fundamental, no sólo en su faceta medioambiental, sino también en cuanto al desarrollo social y económico regional.

El reconocimiento de este papel y de la necesidad de colaborar en su gestión sostenible ha sido puesto de manifiesto por distintos organismos internacionales, entre los cuales destaca el trabajo internacional de FAO¹ Forest, generalmente en colaboración con las naciones y con instituciones supranacionales, como es el caso de la Unión Europea, que ha tenido reflejo reciente en el Plan Estratégico de las Naciones Unidas para los Bosques 2017-2030 (UNSPF), la Agenda 2030 sobre Desarrollo Sostenible o el Acuerdo de París sobre cambio Climático.

En el ámbito europeo tanto la Unión Europea, como Forest Europe², destacan el papel del bosque y la necesidad de trabajar tanto a nivel político, como de gestión, en una explotación sostenible de los bosques. Así la Conferencia Ministerial de Madrid de 2015 y La Decisión Ministerial de Oslo de 2011: Los bosques europeos en 2020 ponen de manifiesto la importancia de las funciones económicas de los bosques y su potencial para promover una economía verde y generar y mantener empleos y salarios, contribuyendo al desarrollo rural.

En la misma línea, y en cuanto a la estrategia diseñada por la Unión Europea, señalamos la Resolución del Parlamento Europeo, de 28 de abril de 2015, sobre una nueva estrategia de la UE en favor de los bosques y del sector forestal, de la cual interesa destacar el reconocimiento de que la *“explotación sostenible de los bosques reviste una enorme importancia para el valor añadido local, regional, europeo e internacional, el mantenimiento del empleo en las zonas rurales ... especialmente en las regiones desfavorecidas estructuralmente...”* y la petición a la Comisión y a los Estados miembros para que *“creen incentivos y apoyen los nuevos modelos de negocio, como las comunidades de producción, con miras a alentar a los pequeños propietarios forestales privados a que emprendan una gestión activa y sostenible de sus bosques”*. Destacando la prioridad que debe ser otorgada en este campo a la investigación y al potencial de crecimiento de la industria forestal.

En el presente trabajo abordaremos la situación del monte en Galicia poniendo especial interés en la figura de las Comunidades de Montes Vecinales en Mano Común (CMVMC), un tipo de bien comunal histórico y arraigado que ha obtenido reconocimiento legislativo y que constituye en sí mismo una comunidad de producción.

Como se verá la persistencia de los vecinos en el mantenimiento de esta figura de propiedad comunal, y finalmente el reconocimiento normativo de las CMVMC ha permitido su continuidad hasta la fecha, solventado exitosamente los problemas clásicos derivados del gobierno de lo común (Ostrom 2015, Dietz, Ostrom et al. 2003) y aún fortaleciendo su autogobierno (Lana, Iriarte-Goñi 2015). No obstante, se enfrentan a nuevos cambios que obligan a abordar nuevos problemas, no ya los tradicionales de los comunes como pudieran ser la sobreexplotación, o la regulación pacífica del uso de los recursos por los comunales, sino el contrario, el abandono o la infra explotación (Hayashi, Kanazawa 2014, Marey-Pérez, Calvo-González et al. 2014, Cabana, García et al. 2013).

Asumimos que la estructura de propiedad del monte en Galicia, que, como se verá, se caracteriza por ser mayoritariamente privado en manos de un gran número de propietarios de pequeñas extensiones, unido al envejecimiento y despoblación rural supone un problema para la gestión sostenible de los montes (Picos 2015, Ónega-López, de Oliveira, J. A. P. et al. 2010, Marey Pérez, Rodríguez Vicente et al. 2007).

En este sentido las comunidades de montes, y sus posibles agrupaciones, se configuran como potenciales “comunidades de producción” que debieran aprovechar su estructura y dimensión en la mejora de las herramientas de gestión, no sólo para la gestión del monte en mano común (Marey-Pérez, Gómez-Vázquez et al. 2010, Marey-Pérez, Calvo-González et al. 2014, Rodríguez Vicente, Marey Pérez 2008), sino para trasladarlo a la propiedad privada de sus propios comuneros.

Asumimos que a mayor dimensión las comunidades de montes dispondrán de mayores y mejores recursos para alcanzar el potencial del monte (Ónega-López, de Oliveira, J. A. P. et al 2010), y por ello en el ya descrito escenario de despoblación y envejecimiento rural interesa analizar figuras que permitan alcanzar mayor dimensión respetando la propiedad privada del monte y las características esenciales de los bienes comunales.

El trabajo se centrará en la figura del monte vecinal en mano común en Galicia por lo que tras una somera exposición de la situación del monte en Galicia en cuanto a propiedad y generación de valor nos detendremos

¹ Organización de las Naciones Unidas para la alimentación y la agricultura.

² Forest Europe es una institución paneuropea conformada por 46 países y la Unión Europea para la cooperación en política forestal en Europa.

en los aspectos que consideramos más relevantes en lo que se refiere a propiedad y autogobierno de las Comunidades de Montes Vecinales en Mano Común en Galicia.

Tras este análisis propondremos, y analizaremos el posible encaje en la institución, de la conveniencia y posibilidad de las fusiones de comunidades a partir de la figura existente de la mancomunidad de comunidades de montes.

2. APROXIMACIÓN A LA SITUACIÓN DEL MONTE EN GALICIA.

2.1. DIMENSIÓN Y ESTRUCTURA DE PROPIEDAD

La Resolución del Parlamento Europeo, de 28 de abril de 2015, sobre una nueva estrategia de la UE en favor de los bosques y del sector forestal, reconoce la heterogeneidad del tamaño y características de los bosques y señala que el 60 % de los bosques de la UE son privados, existiendo alrededor de 16 millones de propietarios privados.

De acuerdo con el documento Datos básicos sobre los bosques de la Unión, Política Agraria Común en cifras, del Parlamento Europeo, España es el tercer país con más superficie de bosque arbolado de la UE28, por detrás de Finlandia y Suecia, con un 11,44%, 13,81% y 17,44% respectivamente del total superficie arbolada UE28.

El porcentaje de bosque arbolado de titularidad privada en España supera el 71% y la ratio de hectárea de bosque y otras superficies arboladas por habitante es de 0,59 frente al 4,23 de Finlandia y al 3,18 de Suecia. Tomando la misma fuente, y solo a modo de referencia, el porcentaje de extracción de madera en rollo frente a la superficie arbolada se sitúa en un 84,76% en España frente a un 269,65% en Finlandia y un 248,28% en Suecia.

Si en datos europeos se aprecia una gran diversidad no lo es menos al referirse a la realidad autonómica española.

De acuerdo con el Mapa Forestal de España 2016³, Galicia concentra el 7,34% de la superficie forestal total española, 2.040.754 ha, por detrás de Andalucía, Castilla León, Castilla la Mancha, Aragón y Extremadura, y casi a la par se encuentra Cataluña.

Es la comunidad con mayor porcentaje de suelo forestal privado, por encima del 99%.

Así en lo referente a superficie forestal arbolada el suelo público no llegaría al 1%, siendo el peso del monte privado particular de casi el 77% y el privado en mano común del 22%. Resulta ilustrativo el siguiente gráfico:

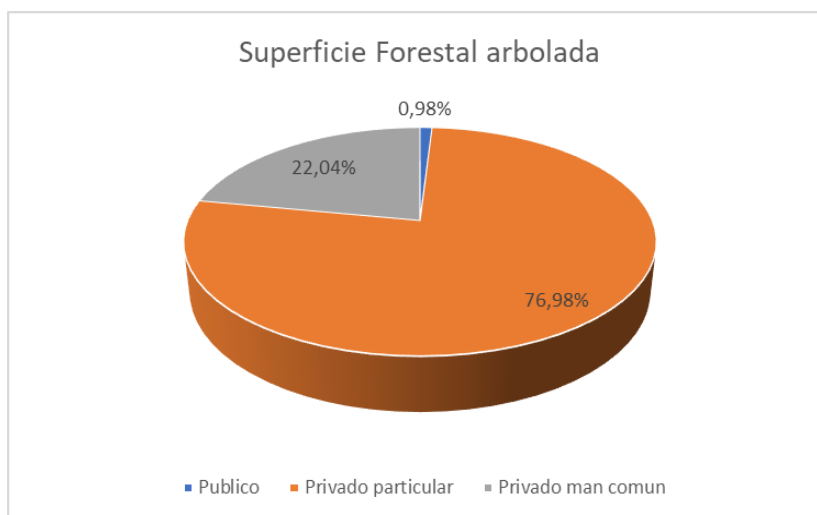


Figura 1. Propiedad Superficie Forestal Arbolada Galicia.
Elaboración propia a partir Mapa forestal de España 2016

Si nos referimos a superficie forestal desarbolada el suelo público se eleva al 2,66%, el privado particular a 47,21% y el privado en mano común al 50,14%.

Por otra parte, el Instituto Galego de Estadística proporciona datos del Catastro inmobiliario rústico, según el cual en el año 2016 figuraban en Galicia 2.838.279 hectáreas de suelo rústico, dividido en 11.102.993 parcelas (algunas divididas en subparcelas) y un total de 1.674.956 propietarios.

³ Elaborado por el Ministerio de Agricultura, Pesca y Alimentación.

Ello arroja una media de 0,26 ha por parcela y 6,62 ha por propietario (que se suponen dispersas), siendo Pontevedra la provincia de mayor fragmentación, con 0,17 ha por parcela y 5,02 ha por propietario y Lugo la de mayor concentración, con 0,42 Ha por parcela y 7,91 ha por propietario.

Tabla 1. Superficie rústica Galicia por propietarios.
Elaboración propia a partir Datos IGE Catastro Inmobiliario rústico

Columna1	Número total de titulares catastra	Superficie total (hectáreas)	Número de parcelas reais	ha /parcela	ha /propietar
A Coruña	514.734,00	742.212,00	2.733.241,00	0,27	5,31
Lugo	291.075,00	970.698,00	2.302.956,00	0,42	7,91
Ourense	397.415,00	713.771,00	3.641.500,00	0,20	9,16
Pontevedra	483.114,00	411.598,00	2.425.296,00	0,17	5,02
Galicia	1.674.956,00	2.838.279,00	11.102.993,00	0,26	6,63

Han de remarcarse por tanto dos características del monte gallego: el reducido tamaño de las fincas y la dispersión de la propiedad, factores que habrán de influir sin duda en los resultados de su explotación.

A esto hay que añadir el dato preocupante de que el 98,2% del monte particular se clasifica por la administración como de propiedad desconocida y dudosa, lo que representa más del 63% de la superficie forestal gallega.

Decimos preocupante no porque no le conste a la administración el propietario, sino porque el envejecimiento de la población, el abandono del rural por la gente joven, unido al reducido tamaño de las parcelas y a su falta, en general, de delimitación clara, nos lleva a pensar que en breve ni siquiera los propietarios conocerán de su propiedad.

2.2. RETORNOS ECONÓMICOS DEL MONTE

Tomando como referencia los mismos países de la UE28 que aventajan a España en suelo Forestal, Finlandia y Suecia, y como fuente Eurostat, Economic aggregates of forestry, los outputs forestales y de la industria secundaria arrojan unas cifras para 2014, de 1.273 MM en el caso de España frente a los 4.741MM de Finlandia y los 4.621 de Suecia (recordemos con un 11,44%, 13,81% y 17,44% del total superficie arbolada UE28 respectivamente).

Consultados los Anuarios de Estadística Forestal 2016 se desprende que en Galicia se producen más del 50%, de las cortas de toda España en volumen (m3 c.c.), principalmente de coníferas y eucalipto, si bien no obtenemos información del valor económico de las mismas.

Por otro lado Galicia no ha aportado a las estadísticas nacionales información de los otros aprovechamientos del monte (parques eólicos, colmenas, otras ocupaciones, cesión para roturación, beneficios del agua, áridos, caza, cultivos o usos recreativos), por lo que desconocemos el aprovechamiento real del monte, si bien algunos autores sostienen que las circunstancias ya citadas de progresivo abandono llevan a un modelo de mayor superficie arbolada y más intensivo en madera (Corbelle, Tubío 2018).

La cadena forestal incorpora otras ramas de actividad como serían la industria de la madera, la del papel y la de la fabricación de muebles (Picos 2015), sin embargo a los efectos del presente trabajo nos centraremos solo en la explotación primaria del monte a través de la silvicultura y explotación forestal.

El Instituto Galego de Estadística nos proporciona los principales datos en términos de producción y empleo en Galicia de la rama de actividad silvicultura y explotación forestal, cuyos datos más recientes y relevantes presentamos en la siguiente tabla.

Tabla 2. Cuentas producción y explotación silvicultura y explotación Forestal.
Elaboración propia a partir IGE. Miles de euros.

Contas de produción e explotación por ramas de actividade. Base 2010. R02 Silvicultura e explotación	2012	2013	2014	2015	2016
P.1 Producción a prezos básicos	568.059,00	595.934,00	611.454,00	647.163,00	653.527,00
P.2 Consumos intermedios	279.601,00	312.440,00	328.011,00	341.132,00	351.115,00
B.1 Valor engadido bruto	288.458,00	283.494,00	283.443,00	306.031,00	302.412,00
D.1 Remuneración de asalariados	107.473,00	78.548,00	84.150,00	96.906,00	98.402,00
D.11 Soldos e salarios	92.333,00	67.074,00	71.858,00	82.750,00	84.028,00
D.12 Cotizacións sociais	15.140,00	11.474,00	12.292,00	14.156,00	14.374,00
D.29-D.39 Outros impostos sobre a produción netos de subvencións	(7.830,00)	(8.686,00)	(9.073,00)	(9.118,00)	(8.646,00)
B.2 Excedente bruto de explotación / Renda mixta	188.815,00	213.632,00	208.366,00	218.243,00	212.656,00

Elaboración propia a partir Cuentas producción y explotación IGE. Miles de euros.

En cuanto al empleo:

Tabla 3. Cuentas producción y explotación silvicultura y explotación Forestal: Detalle empleo.
Elaboración propia a partir IGE. Miles de euros.

Empleo. Contas de producción e explotación por ramas de actividad. Base 2010. R02 Silvicultura e explotación	2012	2013	2014	2015	2016
Postos de trabajo	6.429	6.468	7.115	8.163	8.430
Asalariados	5.054	4.921	5.328	6.120	6.229
Non asalariados	1.375	1.547	1.787	2.043	2.201
Postos de trabajo equivalentes a tempo completo	6.194	6.229	6.959	8.018	8.300
Persoas	6.512	6.609	7.160	8.214	8.395
Persoas asalariadas	5.117	5.016	5.373	6.171	6.194
Persoas non asalariadas	1.395	1.593	1.787	2.043	2.201

La aportación al Valor Añadido Bruto de esta rama de actividad apenas alcanza el 0,6% del total gallego en 2016. En términos de empleo apenas alcanza el 0,8% del empleo gallego, bajando en términos de remuneraciones al 0,4%, indicativo de la precariedad del empleo generado.

3. LAS COMUNIDADES DE MONTES VECINALES EN MANO COMÚN

3.1. EVOLUCIÓN HISTÓRICA DE LA CONFIGURACIÓN LEGAL DE LAS COMUNIDADES DE MONTES VECINALES EN MANO COMÚN

Las formas de propiedad comunal han existido históricamente en toda Europa como formas de aprovechamiento adoptadas por distintos grupos de población y relacionadas generalmente con la subsistencia en medios rurales (Ostrom 2015, Díaz 1999, Bocanegra 2008).

Sobre estas comunidades de convivencia se configuran posteriormente, tras la romanización que trajo consigo la difusión de la Iglesia, las parroquias.

Sobre la conveniencia de las formas comunitarias de propiedad forestal, su generalización y su proyección futura, tomando como referente los montes vecinales gallegos, abogaba García de Enterría (García 1986).

Para Nieto García (Nieto 1964) estas comunidades evolucionaron según dos soluciones, la castellana y la gallega, en la primera vendrían a confundirse en el tiempo con el municipio, mientras que en la segunda se mantiene el vínculo vecinal al margen del administrativo. Esta distinta evolución posiblemente se explique por razones geográficas y se mantiene en la actualidad en Galicia, configurada por numerosos núcleos poblacionales, la mayoría de escasa entidad (Nieto 1964).

Teniendo como nacimiento la costumbre, en el devenir de los tiempos se ha ido configurando jurisprudencialmente esta forma de propiedad (Tamaño, López et al. 2015), y solo posteriormente obtienen reconocimiento normativo.

La configuración jurisprudencial del monte en mano común parte principalmente de la Audiencia Provincial de La Coruña, principalmente a partir de 1954, así la SAP de dicha Audiencia de fecha 16 de octubre de 1954, reconoce la titularidad de un monte a los vecinos en comunidad y la existencia de una comunidad en proindiviso de tipo germánico y por tanto inalienable e indivisible (confirmada por la STS de 28 de diciembre de 1957).

Es a partir de entonces cuando empieza a configurarse jurídicamente la figura del monte en mano común, reconociéndose legalmente, de forma precaria, en la Ley de Montes de 8 de junio de 1957, posteriormente en la Compilación Gallega de 1963 y definitivamente en la Ley 52/1968, de 27 de julio de Montes vecinales en mano común, y su reglamento en 1970.

Así establecía el TS, en sentencia de 17 de enero de 1967, “*Que la vida jurídica de los montes vecinales en mano común de Galicia se desenvolvía en el exclusivo campo del Derecho consuetudinario, fijado por la jurisprudencia, la que estructuró los caracteres de esta institución jurídica, doctrina legal que fue recogida, aunque no en todos sus aspectos, en el art. 4 de la Ley de Montes de 8 junio 1957, y en ella, así como en el artículo 23 de su Reglamento y en los 88 y 89 de la Compilación del Derecho Civil Especial de Galicia, promulgada el 2 diciembre 1963, se contiene la regulación positiva de esta institución, que define el citado art. 88, diciendo que «son montes de vecinos los que pertenezcan en mano común a los vecinos de la parroquia, pueblo o núcleo de población que tradicionalmente los vino disfrutando», con lo que se reconoce, recogiendo las orientaciones jurisprudenciales, que la titularidad de los montes vecinales corresponde a los vecinos de las respectivas demarcaciones territoriales, en régimen de comunidad germánica o en mano común, con las notas de esta propiedad «sui generis» de ser indivisible, inalienable, imprescriptible e inembargable»*”

Para el estudio del régimen jurídico de los montes debemos partir de la previsión contenida en el art. 148.1.8ª de la Constitución Española sobre la posible asunción por las comunidades autónomas de competencias sobre montes y aprovechamientos forestales.

Asumidas las competencias por la Comunidad Autónoma, hemos de destacar que las comunidades de montes en mano común son reconocidas, en sus elementos básicos, en la vigente Ley 2/2006, de 14 de junio, de Derecho Civil de Galicia (LDCG) y específicamente se regulan por la Ley 13/1989, de 10 de octubre, de Montes Vecinales en Mano Común (LMVMC) y su Reglamento, Decreto 260/1992, de 4 de septiembre.

Ambas recogen la evolución jurisprudencial y normativa de la figura de los montes en mano común en Galicia.

3.2. SITUACIÓN DE LAS COMUNIDADES DE MONTES VECINALES EN MANO COMÚN

De acuerdo con el Documento de Diagnóstico del monte y el sector forestal gallego⁴ existían, en 2015, 3.249 montes vecinales de propiedad o dominio y uso privado, pertenecientes a 2.981 Comunidades de vecinos, localizados en 254 municipios en los 19 Distritos Forestales existentes en Galicia que ocupaban un total de casi 666.520 ha y que suponían casi el 33% de la superficie forestal gallega y casi el 34 % del monte privado gallego. Solo uno de cada cinco municipios carecía de montes vecinales.

Casi tres cuartas partes de su superficie, y más de dos de cada tres montes vecinales, están en Lugo y Ourense con unas mil comunidades de vecinos cada una; cerca de la mitad (47%) del monte vecinal gallego está en Ourense y Pontevedra.

El monte vecinal más pequeño no alcanza un cuarto de hectárea y el más grande supera las 5 mil hectáreas, siendo la superficie media de 223,59 hectáreas.

En cuanto al grado de gestión, un 10% de las comunidades vecinales no dispone de estatutos vigentes, más de la tercera parte (34%) no tienen una junta rectora actualizada; el 10% no dispone de censo de vecinos comuneros y la mitad (50%) no lo tienen actualizado.

De los montes vecinales en mano común un 61,80% estarían gestionados por la propia comunidad y un 38,2% lo estarían por la administración pública.

3.3. LAS CARACTERÍSTICAS DE LA PROPIEDAD

Previamente hemos de establecer, en cuanto a la definición del monte vecinal en mano común, que de acuerdo con el artículo 56 de la Ley 2/2006, de 14 de junio, de derecho civil de Galicia, "*Son montes vecinales en mano común las fincas ubicadas en la Comunidad Autónoma de Galicia que, independientemente de su origen, posibilidades productivas, aprovechamiento actual y vocación agraria, pertenezcan a agrupaciones vecinales en su calidad de grupos sociales, y no como entidades administrativas, y que se vengán aprovechando consuetudinariamente en régimen de comunidad sin asignación de cuotas por los miembros de las mismas, en su condición de vecinos con casa abierta y con humo*". En casi idénticos términos el art. 1 LMVMC.

En cuanto a la propiedad establece el art. 60 de la LDCG que "*La propiedad de los montes vecinales en mano común es de naturaleza privada y colectiva, correspondiendo su titularidad dominical y aprovechamiento a la comunidad vecinal respectiva*"

Será el art. 3 de la LMVMC el que concrete el régimen de comunidad, al establecer "*es de naturaleza privada y colectiva, correspondiendo su titularidad dominical y aprovechamiento, sin asignación de cupos*", reconociendo así el carácter germánico de las comunidades que ya había venido reconociendo la jurisprudencia, y del que se dependen las características fundamentales de los montes vecinales en mano común, que a continuación veremos.

Y es el art. 2 LMVMC el que recoge las características de la propiedad, al establecer, "*Los montes vecinales en mano común son bienes indivisibles, inalienables, imprescriptibles e inembargables*".

Vamos a analizar someramente estas características:

- La indivisibilidad deriva de la inexistencia de cuotas, y obedece al aprovechamiento colectivo en el que tiene su génesis, todo pertenece a todos, sin que quepa acción alguna de división.
- La inalienabilidad se refiere tanto a la imposibilidad de transmisión o gravamen del monte, como a la imposibilidad de transmisión de la condición de comunero (derivada de la inexistencia de cuotas).
- La inembargabilidad responde a una función protectora de los montes como una propiedad de origen histórico que se debe mantener y transmitir.
- La imprescriptibilidad impide la adquisición de un tercero por usucapión, tanto comunero como ajeno.

Estas características son las recogidas también en el art. 132 de la Constitución Española en protección de los bienes de dominio público y de los comunales.

⁴ 1ª Revisión del Plan Forestal de Galicia.

Esta protección no impide, como prevé el art. 5 LMVMC, la cesión temporal, onerosa o gratuita, ni el arrendamiento en determinadas condiciones, permitiendo así un aprovechamiento del monte acorde a los tiempos actuales.

3.4. LA FORMA DE ADOPCIÓN DE DECISIONES

La condición de comunero conforme el art. 61 de la LDCG está vinculada a una situación de hecho, la vecindad, así *“La comunidad vecinal se entenderá compuesta por los vecinos que la integren en cada momento”*.

Tendrán la condición de vecinos comuneros aquellas personas titulares de unidades económicas, productivas o de consumo, con casa abierta y residencia habitual independiente dentro del área geográfica sobre la que se asiente el grupo social al que tradicionalmente estuviera adscrito el aprovechamiento del monte.”

Por su parte el art. 3.2 LMVMC determina que *“La Comunidad vecinal a que se refiere el apartado anterior se entenderá compuesta por los vecinos que la integren en cada momento”*.

Es abundante en estos tiempos la jurisprudencia sobre la determinación de la condición de comunero motivada por los conflictos en la admisión de comuneros en aquellas comunidades más prósperas.

Lo cierto es que nos hallamos ante un colectivo cambiante, pues la condición de comunero depende de la residencia, y por ello se gana o se pierde, sin posibilidad de transmisión, pero sin embargo con una relativa estabilidad.

Interesa ahora analizar cómo se toman las decisiones, en este sentido la Asamblea General, de la que forman parte todos los comuneros, es el órgano supremo de expresión de la voluntad de la Comunidad vecinal (art. 14 LMVMC).

Se reunirá con carácter ordinario al menos una vez al año, y con carácter extraordinario iniciativa de la Junta Rectora o a petición de un mínimo del 20 por 100 de los comuneros.

Los quorum para la constitución son, en primera convocatoria de más de la mitad de los comuneros, y en segunda, que se podrá celebrar pasadas al menos dos horas desde la primera, es suficiente la presencia de un 25% de los comuneros⁵.

Para la adopción de acuerdos habrá de estarse a lo dispuesto en el art. 18 LMVMC que establece:

- Para la aprobación, reforma o revocación de los Estatutos, así como los acuerdos referidos a actos de disposición el voto favorable de la mayoría de los presentes que represente al menos el 50 por 100 del censo de comuneros en primera convocatoria y el 30 por 100 en segunda.
- Para la aprobación de la gestión y balance del ejercicio económico, aprovechamientos y actos de administración en general será suficiente la mayoría simple, salvo que en los Estatutos se exija otra mayoría.

Por otra parte, la Junta Rectora es el órgano de gobierno, gestión y representación de la Comunidad, siendo elegida por la Asamblea General por un período máximo de cuatro años.

Es el Presidente de la Junta Rectora quién ostenta la representación legal de la Comunidad.

En relación a ello hemos de destacar que se reconoce normativamente la capacidad de obrar de la Comunidad, pero no así su personalidad jurídica, como ha determinado la Dirección General de los Registros y del Notariado⁶ al establecer *“En definitiva, en las comunidades de montes vecinales en mano común no existe persona jurídica única sino pluralidad de titulares de una propiedad colectiva, sin que cada uno de ellos tenga un derecho singular sobre la cosa, ya que es la pluralidad de sujetos la que tiene un único derecho total. El monte pertenece a la colectividad, no a los individuos singularmente, que carecen de autonomía e independencia, pues no pueden disponer de su parte ni pueden pedir la división de la cosa común al ser la suya una titularidad que les viene conferida en cuanto miembros del grupo social. No se trata de persona jurídica sino de una mera pluralidad coaligada de un número indeterminado y variable de personas unidas por un vínculo de carácter personal, su cualidad de vecinos. La composición personal del grupo cambia con el paso del tiempo (fallecimientos y nacimientos, cambios de residencia), pero el monte sigue perteneciendo al colectivo”*.

4. LA FUSIÓN DE COMUNIDADES DE MONTES A TRAVÉS DE LA FIGURA DE LA MANCOMUNIDAD

Partiendo, como anticipamos, de la existencia de nuevos retos para la explotación de lo común, como son el abandono o la infra explotación (Hayashi, Kanazawa 2014, Marey-Pérez, Calvo-González et al 2014, Cabana, I García et al 2013), de una estructura de propiedad muy fragmentada, aún en el caso de las comunidades

⁵ A estos efectos, ya los de computo de mayorías un comunero solo podrá delegar su representación en otro comunero, sin que ninguno pueda asumir más de una delegación (art. 14.5 LMVMC).

⁶ Resolución 4445/2014, de 20 marzo 2014, que niega la inscripción de una mercantil participada por una comunidad de montes al carecer esta de personalidad jurídica.

de montes, unido al envejecimiento y despoblación rural que suponen puntos débiles en la gestión sostenible de los montes (Juan Picos 2015, Ónega-López, de Oliveira, J. A. P. et al. 2010, Marey Pérez, Rodríguez Vicente et al. 2007), entendemos conveniente reflexionar, imaginativamente sobre figuras que permitan enfrentar estas amenazas.

Es por ello que asumiendo que a mayor dimensión las comunidades de montes dispondrán de mayores y mejores recursos para alcanzar el potencial del monte (Ónega-López, de Oliveira, J. A. P. et al. 2010), proponemos la fusión de comunidades de montes como una figura que permita alcanzar mayor dimensión respetando la propiedad privada del monte y las características esenciales de los bienes comunales, entendiendo que la figura de mancomunidad, como una nueva comunidad pudiera ser una figura válida.

El art. 15 LMVMC, referido a la Junta Rectora, incluye, a nuestro juicio totalmente desubicada, la previsión relativa a la posibilidad de mancomunarse de las propias comunidades de montes *“para la mejor defensa de sus intereses y consecución de sus objetivos”*.

Nada más aclara la ley, y tampoco resulta muy clarificador el art. 47 del Reglamento, cuando se refiere al ***“contrato en que se plasme esta comunidad de bienes, o los estatutos de la asociación que se cree, y en general la fórmula jurídica que se utilice, deberá ser comunicada al registro general de montes vecinales en mano común a través de la sección provincial correspondiente, adjuntando poder bastante de quien actúe en representación de dicha comunidad”***.

Destacamos el término comunidad de bienes, pues será el punto de partida de nuestra reflexión.

Entiende Díaz Fuentes (Díaz 1999) que no puede, como permitiría el art. 47 del Reglamento, constituirse una comunidad de bienes, pues ello supondría la participación de las dos comunidades en un suelo único, lo cual chocaría con la inalienabilidad del monte: Por ello entiende que la mancomunidad debe operar exclusivamente a efectos de disfrute o explotación. Y en este sentido se han mancomunado, ciertamente, diversas comunidades de montes.

Discrepamos de Díaz Fuentes en cuanto a la imposibilidad de mancomunarse a través de una comunidad de bienes, pues, aunque compartimos que no podríamos estar ante el concepto de comunidad de bienes del artículo 392 del código civil, que chocaría con el carácter de comunidad germánica que rige las comunidades de montes, entendemos que si cabe una nueva comunidad germánica o en mano común por agrupación de dos o más comunidades.

No impide la legislación, con respeto a las características básicas del suelo en mano común, determinados negocios en relación a la propiedad del suelo, así:

Nada obsta a que las comunidades de montes adquieran suelo que pasará a ser comunitario, de hecho, el art. 57 de la Ley 7/2012, de 28 de junio, Ley de Montes de Galicia (LMG) prevé un derecho de adquisición preferente tanto de las superficies colindantes como de sus enclavados.

Por otra parte la posibilidad de transmisión está recogida en el art. 9 del Reglamento CMVMC mediante la figura de la permuta, que requerirá informe favorable de la Consellería de Agricultura, Ganadería y Montes sobre la similitud del valor de los terrenos permutados y la colindancia de los terrenos a permutar. Luego se admite la posibilidad de cambiar monte por monte sin que ello afecte a la inalienabilidad. En contra sin embargo por afectar a la inalienabilidad se pronunciaba el grupo de los comunes (Leiceaga [et al.] 2006).

Si bien es cierto, que la inalienabilidad del monte impediría la transmisión del monte de una comunidad a favor de otra, no encontramos impedimento a la agrupación de montes comunales con agrupación también de sus comunidades vecinales, sobre la base del carácter germánico de la comunidad.

Así, dada la inexistencia de cuotas propia de la comunidad germánica, la agrupación de las propiedades no implicaría ni la transmisión del monte, ni de la condición de comunero, convirtiéndose todos los comuneros, los de una y otra comunidad, en titulares, nuevamente sin cuotas del monte agrupado.

No parece que este acuerdo sea contrario a derecho, ni que vaya en contra de la institución, pues no supone una alienación del monte, ni cambia el régimen de titularidad de los comuneros, simplemente se trata de un cambio o ampliación del término de la vecindad que debería ser acordado, entendemos que, con mayorías reforzadas, en las respectivas Asambleas.

Si esta posibilidad puede resultar de interés en comunidades activas, puede ser de interés también en comunidades que se quedan sin comuneros, o donde estos ya no tienen capacidad de gestión⁷.

De esta forma esta mancomunidad o fusión de comunidades permitiría incorporar comunidades que se van quedando sin representación, o simplemente alcanzar un mayor tamaño a las operativas, lo cual habría de permitirles aumentar los recursos para su gestión y un mejor aprovechamiento de estos.

Evidentemente la idea que se apunta precisaría de un estudio más detallado, y de resultar viable y conveniente, de un reflejo normativo, si bien realmente no estaríamos proponiendo nada ajeno a otras

⁷ En este sentido el Diagnóstico del grupo de trabajo para la 1ª Revisión del Plan Forestal Gallego ya citado.

fórmulas ya previstas como consecuencia del abandono de los núcleos rurales, como sería el caso de los convenios para la fusión de municipios previstos la Ley de Bases de Régimen Local.

Yendo más allá podría incardinarse en las medidas de protección y gestión cautelar del monte contempladas en la LCMVMC, previstas para cuando se extinga o desaparezca la comunidad de vecinos titular del monte.

Actualmente la ley nacional permite que dichos bienes pasen, por prescripción de 30 años, a ser bienes comunales públicos, luego se quiebra con esta medida el carácter de la imprescriptibilidad.

La ley gallega, en una solución más imaginativa, y más acorde a la regla de imprescriptibilidad (Bocanegra 2008), establece, en su artículo 27, para el caso de desaparición de la comunidad vecinal, la gestión cautelar pública del monte. Y si bien, como cualquier medida cautelar debiera resultar provisional, no queda sometida a plazo, de tal forma que la gestión pública puede convertirse, de hecho, en indefinida.

Como alternativa, si la gestión cautelar fuese encomendada a las comunidades de montes próximas o más afines al grupo vecinal desaparecido, como pudieran ser comunidades colindantes, de la misma parroquia, municipio o distrito, podría plantearse la subsunción en esta, de forma más o menos inmediata, o al cabo del plazo de prescripción, de tal forma que si volviese a reestablecerse un núcleo vecinal, o un único vecino, los vecinos pasarían a formar parte de la nueva comunidad, no perdiéndose así en ningún momento ni el carácter comunal del monte, ni de su gestión, facilitada como ya dijimos por la inexistencia de cuotas, es decir por el carácter germánico de la comunidad.

Esta posibilidad sería respetuosa con lo recogido en el artículo 20 de la ley gallega, que establece, para situaciones jurídicas de dependencia por extinción o desaparición de la comunidad de vecinos titular del monte, que la defensa de sus intereses recaiga en la parroquia (y solo subsidiariamente en la Consellería de Agricultura). Entendiendo la parroquia como ente colectivo vecinal o grupo social, al margen de la organización territorial del estado (Fernández 2006), pues solo de esta forma se mantiene la adscripción del monte a un grupo social y no administrativo.

Luego ya se reconoce la defensa de los intereses de un colectivo vecinal por otro cercano, por qué no la gestión y en última instancia la titularidad.

Y yendo todavía más lejos podrían instrumentarse medidas para integrar los montes privados abandonados, o de propietario desconocido, en las comunidades de montes colindantes, entendiendo que generalmente son montes pequeños y de escaso valor, sin necesidad de esperar por los plazos de la usucapión, permitiendo su gestión inmediata y estableciendo las salvaguardas para el caso de que aparezca el titular.

Estas medidas no solo tendrían efecto económico, sino también medioambiental, pensemos en la lacra de los incendios y el problema que a estos efectos suponen las pequeñas parcelas abandonadas.

Se evitaría así el intervencionismo público en la gestión del monte, o cuando menos se recurriría a este de forma subsidiaria.

5. CONCLUSIONES

En el presente trabajo hemos abordado la situación del monte en Galicia desde un punto de vista económico y social, prestando especial interés a la figura de los montes vecinales en mano común.

Y si bien esta figura, la del monte vecinal en mano común, ha superado con éxito los problemas clásicos de la gestión de los bienes comunales, nuevas circunstancias exigen plantearse y dar solución a nuevos problemas de gestión.

Así hemos constatado la existencia de circunstancias que dificultan la gestión sostenible de los montes, especialmente por la enorme fragmentación de la propiedad, la reducida dimensión de las parcelas, la despoblación y el envejecimiento rural. En estas circunstancias figuras de propiedad compartida, que agrupan a gran número de propietarios a su vez privados, resultan de gran interés, por cuanto suponen en sí mismas figuras asociativas o comunidades de producción.

No obstante, su dimensión sigue siendo reducida, y por otra parte en algunos casos, y por los factores ya comentados de abandono del rural y envejecimiento, se encuentran sin capacidad de gestión efectiva.

Para dar solución a estos problemas hemos apuntado la posibilidad de la fusión de comunidades mediante la figura legalmente prevista de la mancomunidad de comunidades, entendiendo esta no como una figura asociativa, sino como la constitución de una nueva comunidad que agrupe montes y núcleos vecinales.

Esta fusión se podría realizar por acuerdo de comunidades o por previsión legal en el caso de comunidades extinguidas y por el paso del tiempo, asegurando así la continuidad de la propiedad privada vecinal y la gestión privada del monte vecinal frente a soluciones como la actual de la normativa gallega que prevee una gestión pública cautelar que sin embargo puede acabar convirtiéndose en indefinida.

La propuesta realizada requeriría de estudios previos sobre su conveniencia económico y social, así como del estudio de su viabilidad y seguridad jurídica, que constituirían futuras líneas de investigación.

REFERENCES

- BOCANEGRA, R., 2008. Bienes comunales y vecinales. Madrid: Iustel.
- BRAVO, G., MOOR, T.D., 2008. The commons in Europe: from past to future. *International Journal of the Commons*, 2(2), pp. 155-161.
- CABANA A, GARCÍA AI, PÉREZ M.M, RODRÍGUEZ A. El común de unos pocos. La infrautilización del monte vecinal en la montaña oriental gallega. *Journal of Depopulation and Rural Development Studies*. 2013(15):1-39.
- CORBELLE, E.J., TUBÍO, J.M., 2018. Productivismo y abandono: dos caras de la transición forestal en Galicia (España), 1966-2009. *Bosque (Valdivia)*, 39(3), pp. 457-467.
- DÍAZ, A., 1999. Montes vecinales en mano común. Barcelona: Bosch.
- DIETZ, T., OSTROM, E. and STERN, P.C., 2003. The Struggle to Govern the Commons. *Science*, 302(5652), pp. 1907-1912.
- DIRECCIÓN XERAL DE ORDENACIÓN FORESTAL. Documento de Diagnóstico del monte y el sector forestal gallego. 1ª Revisión del Plan Forestal de Galicia. Galicia: 2015.
- EUROPEAN PARLIAMENT, abril, 2015-last update, A new EU Forest Strategy: for forest and the forest-based sector. European Parliament resolution of 28 de abril 2015.
- FERNANDEZ, C., 2006. Titularidade e aproveitamento dos montes veciñais en man común (adquisición e perda da condición de veciño na Lei 2/2006, do 14 de xuño, de Dereito Civil de Galicia). Monografías Vigo: Revista Xurídica Galega.
- FERNANDEZ, J.F., 2004. Los montes de particulares en el Derecho administrativo español. Navarra: Editorial Aranzadi.
- FOREST EUROPE, 2015. Declaración Ministerial de Madrid: 25 años juntos impulsando la gestión forestal sostenible en Europa. 7ª Conferencia Ministerial sobre los bosques en Europa.
- FOREST EUROPE, 2011. Decisión ministerial de Oslo: Los bosques europeos en 2020. 6ª Conferencia Ministerial sobre la protección de los bosques en Europa celebrada en Oslo 14-15 de Junio de 2011.
- GARCÍA DE ENTERRÍA, E., 1986. Las formas Comunitarias de Propiedad Forestal y su posible proyección futura. Santander: Ediciones de librería Estvdio.
- HAYASHI, M. and KANAZAWA, Y., 2014. Modern changes in the commons problem: Beyond social dilemmas model. *Sociological Theory and Methods*, 29(2), pp. 241-259.
- LANA, J.M. , IRIARTE-GOÑI, I., 2015. Commons and the legacy of the past. Regulation and uses of common lands in twentieth century Spain. *International Journal of the Commons*, 9(2), pp. 510-532.
- LEICEAGA. . . [ET AL.], 2006. Os montes veciñais en man común: O patrimonio Silente; Vigo: Edicións Xerais de Galicia.
- MAREY PÉREZ MF, RODRÍGUEZ VICENTE V, CRECENTE MASEDA R., 2007. Profile of the Galician individual forest owner: Forest management aims and practices in the community northeast. *Revista Galega de Economía*. 2007;16(1):47-70.
- MAREY-PÉREZ MF, CALVO-GONZÁLEZ A, DOMÍNGUEZ-TORRES G., 2014. Are the communal forest owners involved in the management of their lands? A qualitative analysis for the case of Galicia (Spain). *Bosque*. 2014;35(2):207-15.
- MAREY-PÉREZ MF, GÓMEZ-VÁZQUEZ I, DÍAZ-VARELA E., 2010, Different approaches to the social vision of communal land management: The case of Galicia (Spain). *Spanish Journal of Agricultural Research*. 2010;8(3):848-63.
- MIRANDA, D., CRECENTE, R. and ALVAREZ, M.F., 2006. Land consolidation in inland rural Galicia, N.W. Spain, since 1950: An example of the formulation and use of questions, criteria and indicators for evaluation of rural development policies. *Land Use Policy*, 23(4), pp. 511-520.
- NIETO, A., 1964. Bienes comunales. Madrid: Editorial Revista de Derecho Privado.
- ÓNEGA-LÓPEZ, F.-., DE OLIVEIRA, J. A. P. and CRECENTE-MASEDA, R., 2010. Planning innovations in land management and governance in fragmented rural areas: Two examples from Galicia (Spain). *European Planning Studies*, 18(5), pp. 755-773.
- OSTROM, E., 2015. Governing the commons. Cambridge University Press.
- PICOS, J., 2015. O sector forestal en Galicia: problemática actual e perspectivas futuras. *Foro Económico de Galicia*.
- TAMAÑO , LÓPEZ ET ALT. Comunidad de bienes. Valencia: Tirant lo Blanch.

BRECHA DE GÉNERO EN LAS “CARRERAS AZULES”: EL CASO DE INGENIERÍA NAVAL Y OCEÁNICA EN ESPAÑA

LUCÍA SANTIAGO CAAMAÑO

Grupo Integrado de Ingeniería/Universidade da Coruña
Edificio de Talleres (Campus de Esteiro), Mendizábal s/n, 15403 Ferrol/lucia.santiago.caamano@udc.es

EVA AGUAYO LORENZO

Facultad de CC. Económicas y Empresariales/Departamento de Economía Cuantitativa/Universidade de Santiago de Compostela/Avda. Xoañ XXIII s/n. 15782 Santiago de Compostela/eva.aguayo@usc.es

ANA JESÚS LÓPEZ DÍAZ

Universidade da Coruña/Escola Politécnica Superior/Mendizábal s/n, 15403
Ferrol/ana.xesus.lopez@udc.es

VICENTE DÍAZ CASÁS

Grupo Integrado de Ingeniería/Universidade da Coruña
Edificio de Talleres (Campus de Esteiro), Mendizábal s/n, 15403 Ferrol/vicente.diaz.casas@udc.es

e-mail Lucía Santiago Caamaño: lucia.santiago.caamano@udc.es

Resumen

Durante siglos la industria marítima así como la educación y la formación en el ámbito marítimo permaneció principalmente bajo la dominación masculina. A pesar del importante crecimiento de la participación femenina en otras carreras de ciencias, tecnología, ingeniería y matemáticas (STEM) en las últimas décadas, parece que los campos relacionados con el mar aún están por detrás y existe una brecha considerable entre hombres y mujeres involucrados en la ingeniería naval y las actividades relacionadas con el mar. Las mujeres aún no están presentes en toda la cadena de valor en el sector marítimo. Solo representan el 2% de la fuerza laboral marítima mundial y la mayoría de ellas se concentran en labores de procesamiento de pescado.

La economía azul ofrece oportunidades para el empoderamiento económico de las mujeres. Así mismo, el fomento de una mayor integración y participación de las mujeres contribuye al desarrollo del potencial de la economía azul en componentes fundamentales como la sostenibilidad marítima, la innovación tecnológica y la aparición de nuevos mercados laborales.

Por tanto, en este trabajo se presenta una revisión del estado del arte de la situación de mujeres en el sector marítimo, y en particular en las “carreras azules” de ingeniería naval y oceánica en las universidades españolas. Nuestro análisis constata que las percepciones de los estereotipos de género todavía tienen un profundo efecto en la elección de estas carreras universitarias y en sus siguientes oportunidades de empleo.

Palabras clave: Mujeres, Ingeniería Naval y Oceánica, Educación, Brecha de género, Participación.

Eje Temático 10 : Economía Azul. Del Mar y Actividades Marítimas

Abstract

For centuries maritime industries as well as education and training in maritime fields remained mostly under male domination. Despite enormous growth of female participation in other Science, Technology, Engineering and Math (STEM) majors in recent decades, it seems maritime related fields are still behind and there is a considerable gap between men and women involved in marine engineering and maritime related activities. Women are not still presented in the entire value chain in the maritime sector. They only represent 2% of the world's maritime workforce and most of them are concentrated in fish processing.

The Blue Economy provides opportunities for economic empowerment of women. The concept of Blue Economy is not a new thing because it represents the cultural identities of communities living in wetlands, coastal regions, lakes, shores and close to rivers. These identities cannot be complete without women and it is time that women are linked with regional markets, provide tax subsidies and ensure that they have equal access to every sector of the value chain.

The maritime industry is highly competitive and needs to access the entire talent pool to survive. Multicultural human resource is the core of the competence of the maritime industry. In consequence, in this work a review of the state of art of women in maritime sector, and in particular in Maritime and Naval Architecture Engineering, will be presented.

Key Words: Women, Naval Architecture and Marine Engineering, Education, Gender Gap, Participation.

Thematic Area 10: Blue Economy Sea and maritime activities

1. INTRODUCCIÓN

El 70% de nuestro planeta está ocupado por los océanos. La relación del ser humano con los mismos siempre ha sido muy estrecha, valiéndose de los recursos marinos para su supervivencia: pesca, energía, transporte de mercancías, etc. En un mundo con una población en constante crecimiento, la demanda de recursos y la necesidad de empleos se disparan. Por consiguiente, el riesgo de sobreexplotación y la consiguiente destrucción de los océanos se hacen cada vez más acusados y difíciles de gestionar.

Por este motivo surgió el concepto de *economía azul*, que se define como la necesidad de integrar la conservación y la sostenibilidad en la gestión del entorno marítimo. Una economía sostenible basada en el océano es posible cuando existe un equilibrio entre la explotación de los recursos y la preservación de los ecosistemas (Smith-Godfrey, 2016). De esta manera se consigue hacer un uso responsable de los recursos sin perjudicar o destruir el medio marino y permitiendo la regeneración de los mismos.

Dentro de la economía azul se incluyen actividades como la pesca, la acuicultura, el turismo, la prevención de la contaminación, la energía renovable, el transporte de mercancías por mar, la extracción del petróleo y sus derivados así como la minería subacuática (Bennett, 2019).

Para hacernos una idea del valor que tienen estas actividades para la economía global, sólo la pesca y la acuicultura producen 108 millones de toneladas de alimento y 56.9 millones de empleos. Situándose la contribución anual de los océanos a la economía en un 60% del valor total económico de la biosfera (Bennett, 2019).

Dentro de la agenda de la economía azul no sólo se encuentra la protección del medio marino, sino que el principal objetivo es mejorar el bienestar y la equidad social de aquellas personas que viven en las zonas costeras (FAO, 2018; Keen et al., 2018; Smith-Godfrey, 2016). Esto afecta principalmente a tres grupos de población: mujeres, jóvenes y población migrante. La inclusión de estos grupos de población es necesaria para lograr una economía sostenible y es el núcleo del crecimiento azul (Wu et al., 2017).

En este trabajo se hace especial hincapié en el primer grupo, analizando de la situación de las mujeres en el ámbito marítimo. En particular, las carreras azules que habilitan para la profesión de ingeniera naval y oceánica.

2. MUJERES EN EL SECTOR MARÍTIMO

El sector marítimo ha sido tradicionalmente un sector fuertemente masculinizado, con una representación femenina en puestos de dirección y toma de decisiones muy minoritaria, que reflejan la desigualdad de oportunidades entre mujeres y hombres en su promoción profesional (Jones, 2008; Maleki and Stephens, 2018; Tansey, 2015; Wu et al., 2017). La economía azul brindaría la oportunidad de lograr el empoderamiento femenino en este ámbito.

La inclusión de las mujeres en el ámbito marino no es sólo una cuestión de derechos humanos, que lo es, sino que supone el aprovechamiento del talento, la formación, las competencias y conocimientos del 50% de la población, aspectos

vitales para la industria (Burroughs et al., 2018; Jones, 2008). Así, en el caso de Reino Unido, estudios como (Mackenzie, 2015) señalan que en 2020 serán necesarios alrededor de 820.000 trabajadoras y trabajadores para suplir la demanda en las áreas de ciencia, ingeniería y tecnología (STEM), por lo que la incorporación de mujeres en estos ámbitos se convierte en una necesidad.

Por otra parte, la diversidad de género mejora la productividad e incrementa los beneficios económicos en las empresas porque fomenta la innovación y la creatividad al introducir diferentes formas de pensamiento y mejora el acceso a nuevos mercados (Mackenzie, 2015).

A pesar de ello, la participación femenina en el mundo marítimo es extremadamente baja. A nivel global, sólo un 2% de los marinos y un 33% de los puestos en tierra relacionados con el sector marítimo están ocupados por mujeres (Ibrahim, 2018; Wu et al., 2017). Sin embargo, esta participación no está uniformemente distribuida en los diferentes puestos de trabajo; el mayor porcentaje de mujeres se concentra alrededor de la pesca, donde representan el 90% del personal que se dedica a las tareas de procesamiento del pescado y posterior venta (Burroughs et al., 2018; Gissi et al., 2018). Las mujeres también han destacado en el campo de la conservación marina y la oceanografía (Gissi et al., 2018).

No ocurre lo mismo en las áreas en las que se requiere estar a bordo, como en el caso de la marina mercante, la actividad de pesca en sí misma o en las carreras y profesiones relacionadas con las disciplinas STEM; en este sentido el porcentaje de mujeres matriculadas en los grados de ingeniería y el porcentaje de ingenieras empleadas se sitúan en el 19% y 10% respectivamente, llegando a ser incluso inferior en algunos campos de especialización. A pesar de la situación de equilibrio en el alumnado de educación secundaria, a nivel universitario las alumnas que optan por estas carreras representan un porcentaje muy bajo. Además, este desequilibrio de género se ve más acusado al ir ascendiendo en la escala académica y/o profesional (Dominguez et al., 2014; Horck, 2010; Mackenzie, 2015; Maleki and Stephens, 2018).

La principal razón de esta escasa incursión de las mujeres en el ámbito marítimo se atribuye a la persistencia de estereotipos de género, que condicionan la elección de las carreras universitarias y la toma de decisiones a nivel profesional (Maleki and Stephens, 2018; Wu et al., 2017).

3. BRECHA DE GÉNERO EN LA PROFESIÓN DE INGENIERÍA NAVAL EN ESPAÑA

En el caso del sector de la construcción naval esta brecha de género es todavía más evidente. Para el análisis de esta problemática es necesario remitirse al panorama en las titulaciones que habilitan para el acceso a la profesión de ingeniería naval y oceánica en España; esto nos permitirá conocer la situación actual y la tendencia futura de las mujeres en este campo, ya que serán las que tengan acceso a este mercado laboral en los próximos años.

La adaptación al Espacio Europeo de Educación Superior conllevó una estructuración de las titulaciones universitarias. En el caso de aquellas vinculadas al ámbito naval, los títulos de grado habilitan para la profesión de ingeniero/a técnico/a naval, mientras que para la profesión de ingeniero/a naval y oceánico/a

se requiere la realización de un máster habilitante específico, Máster Universitario en Ingeniería Naval y Oceánica (BOE, 2009^a, 2009b).

Actualmente en España existen 7 universidades repartidas por todo el territorio donde se imparten estas titulaciones. Todas ellas, excepto dos (Universidad de Las Palmas de Gran Canaria y Universidad de Cantabria) ofrecen la posibilidad de cursar tanto el título de grado como el máster habilitante.

Tabla 1. Universidades españolas y titulaciones de ingeniería naval

Universidades	Titulaciones
Universidad Politécnica de Cartagena	Graduado o Graduada en Arquitectura Naval e Ingeniería de Sistemas Marinos
	Máster Universitario en Ingeniería Naval y Oceánica
Universidad de Cádiz	Graduado o Graduada en Arquitectura Naval e Ingeniería Marítima
	Máster Universitario en Ingeniería Naval y Oceánica
Universidad Politécnica de Madrid	Graduado o Graduada en Arquitectura Naval
	Graduado o Graduada en Ingeniería Marítima
	Máster Universitario en Ingeniería Naval y Oceánica
Universitat Politécnica de Catalunya	Graduado o Graduada en Ingeniería en Sistemas y Tecnología Naval
	Máster Universitario en Ingeniería Naval y Oceánica
Universidad de Las Palmas de Gran Canaria	Graduado o Graduada en Ingeniería en Tecnología Naval
Universidade da Coruña	Graduado o Graduada en Ingeniería Naval y Oceánica
	Máster Universitario en Ingeniería Naval y Oceánica
Universidad de Cantabria	Graduado o Graduada en Ingeniería Marina por la Universidad de Cantabria

El análisis de la brecha de género en estas titulaciones se ha realizado a partir de los datos de alumnado matriculado en los últimos 5 años (período 2013-2018) disponibles en los portales web de transparencia de las universidades; es por ello que se limita a las siguientes: Universidad Politécnica de Madrid (UPM), Universitat Politécnica de Catalunya (UPC), Universidade da Coruña (UDC) y Universidad de Cantabria (UC).

En las figuras 1 y 2 se muestran los datos de matrícula en las titulaciones de grado y máster, respectivamente, desagregados por sexo y curso académico. Como se puede observar, a nivel nacional el desequilibrio de género está presente con una tendencia claramente constante en el tiempo. Solamente un 20% del alumnado de grado son mujeres. Si comparamos este dato con el resto de carreras pertenecientes al grupo STEM vemos que el desequilibrio de género se perpetúa. En cuanto al máster, el comportamiento es distinto puesto que el número de personas matriculadas se ha ido incrementando desde su implantación en el curso académico 2014/2015. En la Figura 2 se puede observar que en ese primer curso

la situación de género fue paritaria, con un 44% de alumnas; pero su presencia se ha ido reduciendo hasta aproximarse a los títulos de grado, con un 26% de alumnas en el curso 2017/2018.

Por otra parte, al comparar el porcentaje de alumnas de máster, y por tanto con acceso a la categoría profesional de ingeniera naval y oceánica, con los datos de las titulaciones anteriores al EEES que habilitaban para esta profesión, se observa que la presencia femenina se ha venido manteniendo en el tiempo desde 1992 (Cruz et al., 2011).

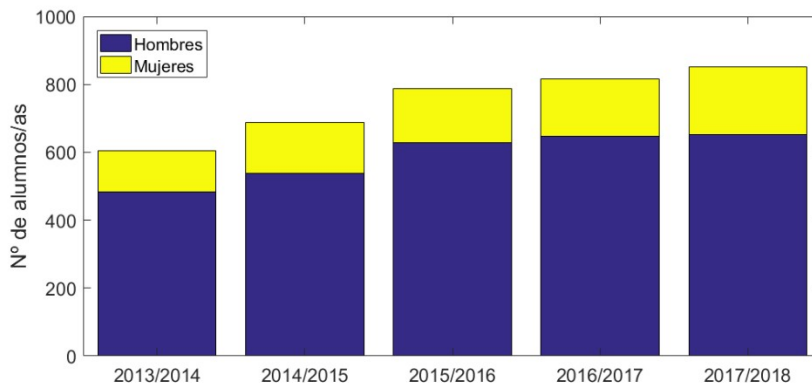


Figura 1. Número de alumnas y alumnos matriculados en títulos de grado

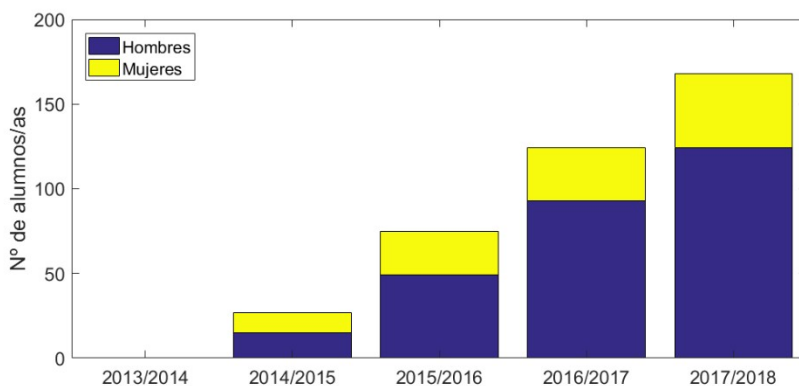


Figura 2. Número de alumnas y alumnos matriculados en el máster

Si desglosamos los datos por universidades (figuras 3 y 4) se observa un comportamiento similar; en la mayoría de los títulos de grado (Figura 3) el porcentaje de alumnas se sitúa en torno al 20%. Cabe destacar el caso de la Universidade da Coruña donde la cifra asciende al 27%, es decir, casi un tercio del

alumnado de ingeniería naval y oceánica son mujeres. Otro aspecto a destacar de la Figura 3 es la situación de los grados de Ingeniería en Sistemas y Tecnología Naval de la UPC e Ingeniería Marina de la UC en los cuales la proporción de mujeres es mucho más baja que en los demás. En cuanto a los másteres (Figura 4), no se observa diferencia respecto a los datos a nivel nacional.

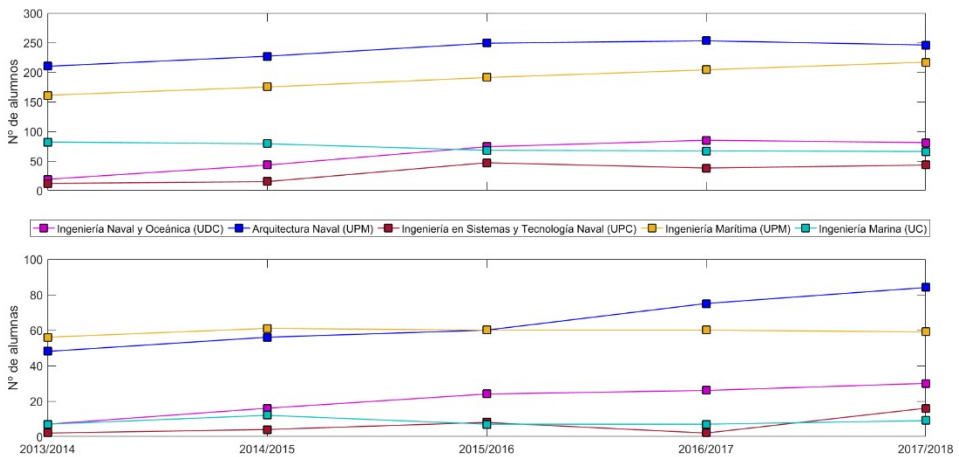


Figura 3. Número de alumnas y alumnos matriculados por grado y curso académico.

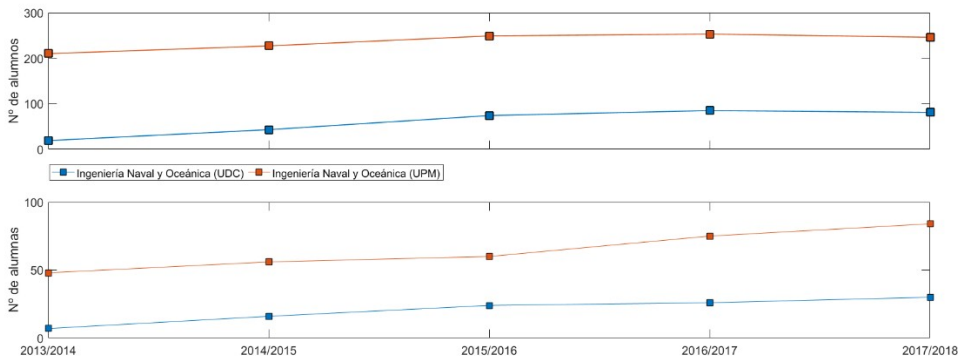


Figura 4. Número de alumnas y alumnos matriculados por máster y curso académico.

4. CONCLUSIONES Y PERSPECTIVA FUTURA

En este trabajo se ha presentado una breve revisión de la situación de las mujeres en el ámbito marítimo, un sector fuertemente masculinizado. A pesar de que las mujeres se han hecho cada vez más visibles en este ámbito, su presencia en la industria marítima está aún muy por debajo de la paridad (40%-60%) y además se

concentra en unas pocas actividades (principalmente relacionadas con el procesado de la pesca).

El paradigma de la economía azul ofrece un gran potencial para conseguir los necesarios avances en la reducción de la brecha de género y el empoderamiento de las mujeres en las distintas áreas relacionadas. No obstante, para saber dónde y cómo actuar es necesario conocer la situación actual de las mujeres en cada área.

En este trabajo se presenta un análisis de la situación de las mujeres en las titulaciones que habilitan para la profesión de ingeniera naval. De él se puede concluir que en este ámbito el desequilibrio de género persiste, con un porcentaje de alumnas en los grados y másteres en torno al 20%. Lo más destacable de este dato es que ha permanecido prácticamente constante a en los últimos 20 años.

Cabe por tanto suponer que a menos que se tomen medidas correctoras la situación no mejorará, desaprovechando el talento del 50% de la población en el ámbito de la industria marítima, limitando su competitividad y sostenibilidad.

Urge por tanto llevar a cabo políticas y programas que fomenten la participación de las mujeres en estas carreras desterrando los estereotipos de género y visibilizando a las mujeres para crear referentes femeninos (Wu et al., 2017).

REFERENCIAS

- BENNETT, N.J., 2019. Marine Social Science for the Peopled Seas. *Coastal Management* 0, 1–10. doi:10.1080/08920753.2019.1564958
- BOE, 2009a. Orden CIN/350/2009, de 9 de febrero, por la que se establecen los requisitos para la verificación de los títulos universitarios oficiales que habiliten para el ejercicio de la profesión de Ingeniero Técnico Naval.
- BOE, 2009b. Orden CIN/354/2009, de 9 de febrero, por la que se establecen los requisitos para la verificación de los títulos universitarios oficiales que habiliten para el ejercicio de la profesión de Ingeniero Naval y Oceánico.
- BOE, 2007. Real Decreto 1393 / 2007 , de 29 de octubre , por el que se establece la ordenación de las enseñanzas universitarias oficiales.
- BURROUGHS, L., EGOROVA, S., ŠADIĆ, E., SOETH, K., 2018. Women in Maritime Communities.
- CRUZ, M.P. DE, FILGUEIRA, A., LÓPEZ, A.J., 2011. Women in engineering : the case of the polytechnic school (eps) at the University of A Coruña, in: 5th International Technology, Education and Development Conference. Valencia, España, pp. 2319–2326.
- DOMÍNGUEZ, M., DE, J.C., GONZÁLEZ, R., TORRADO, M., AGUIAR, V., AGUIRRE, V., 2014. Las desigualdades de género en el Sistema Universitario de Galicia . El caso de las enseñanzas técnicas, in: XXII Jornadas ASEPUMA – X Encuentro Internacional, Anales de ASEPUMA. pp. 1–22.
- FAO, 2018. Leaving no one behind in Karamoja 1–8.
- GISSI, E., PORTMAN, M.E., HORNIDGE, A., 2018. Un-gendering the ocean : Why women matter in ocean governance for sustainability. *Marine Policy* 94, 215–219. doi:10.1016/j.mar-pol.2018.05.020
- HERGUIDO, J., PARTAL, P., FEIJOO, G., IBA, R., SÈMPERE, J., LÓPEZ-PÉREZ, M.F., RIVERO, M.J., 2018. Education for Chemical Engineers Education of chemical engineering in Spain : A global picture 24, 27–31. doi:10.1016/j.ece.2018.05.003
- HORCK, J., 2010. The Gender Perspective in Maritime Education and Training. WMU

Journal of Maritime Affairs 9, 93–119.

IBRAHIM, M., 2018. Why the maritime industry needs more women. *Raconteur*.

JONES, R.G., 2008. Reports and Comments Empowering Professional Women in the Maritime World: the WMU Contribution. *WMU Journal of Maritime Affairs* 7, 505–508.

KEEN, M.R., SCHWARZ, A.M., WINI-SIMEON, L., 2018. Towards defining the Blue Economy: Practical lessons from pacific ocean governance. *Marine Policy* 88, 333–341. doi:10.1016/j.marpol.2017.03.002

MACKENZIE, B., 2015. The “Leaky Pipeline”: Examining and Addressing the Loss of Women at Consecutive Career Stages in Marine Engineering, Science and Technology, in: Kitada, M., Williams, E., Froholdt, L.L. (Eds.), *Women: Global Leadership*. Springer. doi:10.1007/978-3-662-45385-8

MALEKI, F., STEPHENS, G., 2018. A Case Study on Gender Gap in Massachusetts Maritime Academy. doi:10.18260/1-2—27445

SMITH-GODFREY, S., 2016. Defining the blue economy. *Maritime Affairs* 12, 58–64. doi:10.1080/09733159.2016.1175131

TANSEY, P., 2015. Women at the Helm: 25 years of IMO’s gender programme, in: Kitada, M., Williams, E., Froholdt, L.L. (Eds.), *Women: Global Leadership*. Springer. doi:10.1007/978-3-662-45385-8

WU, C.L., CHEN, S.Y., YE, K.D., HO, Y.W., 2017. Career development for women in maritime industry: organisation and socialisation perspectives. *Maritime Policy and Management* 44, 882–898. doi:10.1080/03088839.2017.1341062



¿EXISTEN DIFERENCIAS EN EL COMPORTAMIENTO ASOCIACIONISTA DE LOS CIUDADANOS ARAGONESES EN FUNCION DE LA LOCALIDAD EN LA QUE RESIDEN?

CRISTINA BERNAD MORCATE

Facultad de Economía y Empresa/Universidad de Zaragoza
Departamento de Dirección y Organización de Empresas
Gran Vía 2, Zaragoza 50.005

CARMINA MARCUELLO SERVÓS

Facultad de Economía y Empresa/Universidad de Zaragoza
Departamento de Dirección y Organización de Empresas
Gran Vía 2, Zaragoza 50.005

e-mail Cristina Bernad Morcate: bernadc@unizar.es

Resumen

El objetivo del trabajo es conocer si existen diferencias en el comportamiento asociacionista de los habitantes de Aragón en función del tamaño de la localidad en la que residen. Para ello llevaremos a cabo un análisis de: la evolución temporal en la creación de asociaciones, la localización en función del tamaño de la localidad y las distintas finalidades de las asociaciones creadas desde el año 2000.

La información procede del Registro General de Asociaciones del Gobierno de Aragón. En el momento de la creación de las asociaciones se proporcionan información acerca de la fecha, el lugar y el fin de la misma. Para clasificar la finalidad de las asociaciones emplearemos la clasificación Internacional de Salamon y Hopkins (1992). En términos absolutos es Zaragoza, la provincia en donde más asociaciones se crean, sin embargo, en contra de lo que se podía esperar, es Teruel la provincia que más asociaciones crea por cada 10.000 habitantes. Las provincias aragonesas presentan un tamaño muy dispar: en 2018, la provincia de Zaragoza representa el 73% del total, Huesca, el 17% y la de Teruel, el restante 10%.

En cuanto a la finalidad por la que han sido creadas, los datos analizados muestran que, las asociaciones más frecuentes a lo largo de todos los años son las culturales y los servicios sociales.

Por último, nos planteamos si existen diferencias en el comportamiento de los ciudadanos aragoneses en función de la localidad en la que residen. Los datos del último año analizado muestran como el comportamiento es totalmente distinto: en Huesca y Teruel predominan las asociaciones en el mundo rural de tipo cultural. En Zaragoza, sin embargo, la situación es totalmente distinta, el mayor grado de asociacionismo tiene lugar en la capital destacando las culturales, de derechos civiles y las de salud.

Palabras clave: asociaciones, creación de asociaciones, localización , población, finalidad.

Abstract

The objective of the work is to know if there are differences in the associationist behavior of the inhabitants of Aragon depending on the size of the locality in which they reside. For this we will carry out an analysis of: the temporal evolution in the creation of associations, the location according to the size of the locality and the different purposes of the associations created since the year 2000.

The information comes from the General Register of Associations of the Government of Aragon. At the time of the creation of the associations, information is provided about the date, place and purpose of the association. To classify the purpose of the associations we will use the International classification of Salamon and Hopkins (1992).

In absolute terms it is Zaragoza, the province where more associations are created, however, contrary to what could be expected, Teruel is the province that creates the most associations for every 10,000 inhabitants. The Aragonese provinces have a very different size: in 2018, Zaragoza represents 73% of the total, Huesca, 17% and Teruel, the remaining 10%.

In terms of the purpose for which they were created, the data analyzed show that the most frequent associations throughout the years are cultural and social services.

Finally, we consider if there are differences in the behavior of the citizens of Aragon depending on the locality in which they reside. The data of the last year analyzed shows how the behavior is totally different: in Huesca and Teruel the associations in the rural world of cultural type predominate. In Zaragoza, however, the situation is completely different, the highest degree of associationism takes place in the capital highlighting cultural, civil rights and health

Key Words: associations, creation of associations, location, population, purpose.

Eje Temático 6 : Economía Social, Cooperación y Desarrollo

1. INTRODUCCIÓN

El Tercer Sector se puede definir como un conjunto de empresas y organizaciones cuyas actividades productivas responden a unos principios solidarios, como son la libre adhesión, la democracia interna, las ganancias limitadas, y el respeto a la dimensión humana en sus actuaciones (Sajardo y Chaves, 2006). La Economía Social se estructura por tanto, como la alternativa para corregir los efectos socioeconómicos generados por la difusión del mercado, conciliando a la vez interés ciudadano y justicia social.

La Ley 5/2011 define la Economía Social como el “conjunto de actividades económicas y empresariales, que en el ámbito privado llevan a cabo aquellas entidades que persiguen bien el interés colectivo de sus integrantes, bien el interés general económico o social, o ambos”. Las empresas que conforman la Economía Social son empresas que generan un impacto directo en la sociedad ya que crean un empleo estable y de calidad (sin exclusión), muestran que otra economía es posible y están comprometidas con las personas y con el territorio. La economía social está integrada por tres grandes familias de entidades: las cooperativas, las mutualidades y las asociaciones.

Las asociaciones son empresas comprometidas con el territorio, que no se deslocalizan de donde nacieron y responden a las necesidades del territorio, de acuerdo a unos principios de promoción de la solidaridad interna y el compromiso con el desarrollo local y; comprometidas con las personas que trata de construir una sociedad más equitativa de integración de jóvenes, personas con discapacidad o en riesgos de exclusión social (Pedreño Frutos, 2017). Por eso, resulta de gran importancia analizar en qué medida la creación de asociaciones nos permite valorar la capacidad de organizarse colectivamente de las personas de una sociedad.

En el momento de la creación de las asociaciones estas proporcionan información acerca de las asociaciones creadas, la fecha de creación, el lugar de creación y los fines de la entidad. Esto nos permite conocer la cronología de la evolución de la creación de asociaciones pudiendo distinguir diferentes periodos, la localidad y la finalidad de las asociaciones que han sido creadas.

El objetivo del trabajo es conocer si existen diferencias en el comportamiento asociacionista de los habitantes de Aragón en función del tamaño de la localidad en la que residen. Para ello llevaremos a cabo un análisis de: la evolución temporal en la creación de asociaciones, la localización en función del tamaño de la localidad y las distintas finalidades de las asociaciones creadas desde el año 2000 (Marcuello, 2016 y 2017).

En la Comunidad Autónoma de Aragón, se han constituido más de 10.000 asociaciones desde el año 2000: 2.207 en Huesca, 6.037 en Zaragoza y 2.041 en Teruel. Sin embargo, es importante tener en cuenta la distinta población en cada una de las tres provincias aragonesas, lo que hace importante el cálculo de una tasa de creación de asociaciones por habitante.

Por último, a partir del Real Decreto 949/2015, de 23 de octubre (por el que se aprueba el Reglamento del Registro Nacional de Asociaciones) y la Clasificación internacional de Organizaciones no Lucrativas propuesta por Salamon y Anheier (1994), analizaremos la distribución por actividades que nos permite conocer cuál

es la tipología de las asociaciones en cada uno de los municipios de la Comunidad Autónoma.

2. CREACIÓN DE ASOCIACIONES EN ARAGÓN: 2000-2018

El objetivo de este epígrafe es realizar un análisis de la creación de asociaciones en la Comunidad Autónoma de Aragón desde el año 2000, para profundizar en cual ha sido la evolución en cada una de las tres provincias aragonesas tanto en términos absolutos como relativos en función de la población.

La información disponible procede del Registro General de Asociaciones de la Comunidad Autónoma de Aragón y se refiere a todas las asociaciones cuya sede radica en Aragón. En esos registros se incorpora para cada asociación los siguientes elementos: denominación, fines de la entidad, ámbito, fecha de creación y domicilio.

En la Tabla 1, se observa como desde el año 2000 se han creado en Aragón más de 10.000 asociaciones. Durante el periodo analizado, el comportamiento en cada una de las tres provincias aragonesas ha sido diferente. En Zaragoza, se han creado más de la mitad de las asociaciones (58,69% del total), mientras que el resto se ha repartido de manera similar entre Huesca (21,45%) y Teruel (19,84%).

Tabla 1. Asociaciones creadas en Aragón 2000-2018¹

AÑO	ARAGON	HUESCA		ZARAGOZA		TERUEL	
		nº asoc	% total	nº asoc	% total	nº asoc	% total
2000	413	113	27,36%	240	58,11%	60	14,53%
2001	524	147	28,05%	253	48,28%	124	23,66%
2002	452	133	29,42%	231	51,11%	88	19,47%
2003	521	120	23,03%	287	55,09%	114	21,88%
2004	590	132	22,37%	318	53,90%	140	23,73%
2005	599	108	18,03%	379	63,27%	112	18,70%
2006	534	145	27,15%	283	53,00%	106	19,85%
2007	573	116	20,24%	338	58,99%	119	20,77%
2008	630	141	22,38%	330	52,38%	159	25,24%
2009	616	128	20,78%	367	59,58%	121	19,64%
2010	670	127	18,96%	407	60,75%	136	20,30%
2011	576	119	20,66%	332	57,64%	125	21,70%
2012	587	119	20,27%	355	60,48%	113	19,25%
2013	619	127	20,52%	388	62,68%	104	16,80%
2014	579	120	20,73%	341	58,89%	118	20,38%
2015	497	103	20,72%	310	62,37%	84	16,90%
2016	667	101	15,14%	466	69,87%	100	14,99%
2017	486	91	18,72%	318	65,43%	77	15,84%
2018	152	17	11,18%	94	61,84%	41	26,97%
TOTAL	10.285	2.207		6.037		2.041	

Fuente: elaboración propia a partir de datos del Registro General de Asociaciones de Aragón.

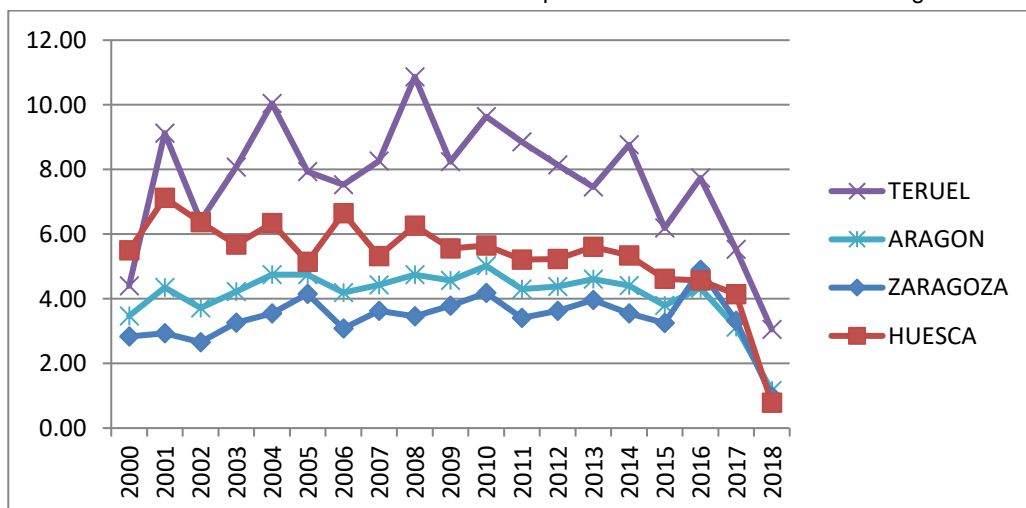
¹ Los datos del número de asociaciones están tomados a diciembre de 2018, por lo que pueden no reflejar la situación real, al haber un desfase en la incorporación a la web del Registro General de Asociaciones de Aragón

La Comunidad Autónoma de Aragón presenta grandes diferencias en términos de población en cada una de las tres provincias. Así, en 2018, la provincia de Zaragoza representa el 73% del total de la población aragonesa, la provincia de Huesca, el 17% y la de Teruel, el restante 10%.

Si consideramos la población a lo largo de los años en cada una de las tres provincias, comprobamos que, en contra de lo que se podía esperar tras el análisis en términos absolutos del número de asociaciones creadas, es Teruel la provincia con un mayor número de asociaciones creadas por habitante.

En el gráfico 1 se constata que, en todo el periodo analizado, Teruel es la provincia que más asociaciones por cada 10.000 habitantes tiene. En 2017², 5,53 asociaciones por cada 10.000 habitantes frente a los 4,14 de Huesca y 3,34 de Zaragoza (y los 3,12 de Aragón).

Gráfico 1 .Evolución nº asociaciones creadas por cada 10.000 habitantes en Aragón



Fuente: elaboración propia a partir de datos del Registro General de Asociaciones de la Comunidad Autónoma de Aragón.

Otro aspecto a considerar en el proceso de creación de asociaciones en Aragón tiene que ver con cual ha sido el comportamiento en cada una de las tres capitales de provincia y el resto de la provincia. Una primera aproximación, nos permite distinguir entre las asociaciones creadas en la capital de provincia (que se podría corresponder con un entorno más urbano) y las asociaciones creadas fuera de la capital (entorno más rural).

En la Tabla 2 se muestra esta distribución y se observa cómo en la provincia de Huesca y Teruel, la mayor parte de las asociaciones han sido creadas en la provincia (lo que podríamos denominar rural) con porcentajes que superan el 70% mientras que en Zaragoza, en todos los años analizados, la situación es justo la

² Tal y como comentábamos en la Nota a pie 1, los datos de 2018 pueden no presentar la situación real de las asociaciones creadas.

contraria: la mayor parte de asociaciones zaragozanas han sido creadas en la capital de la provincia.

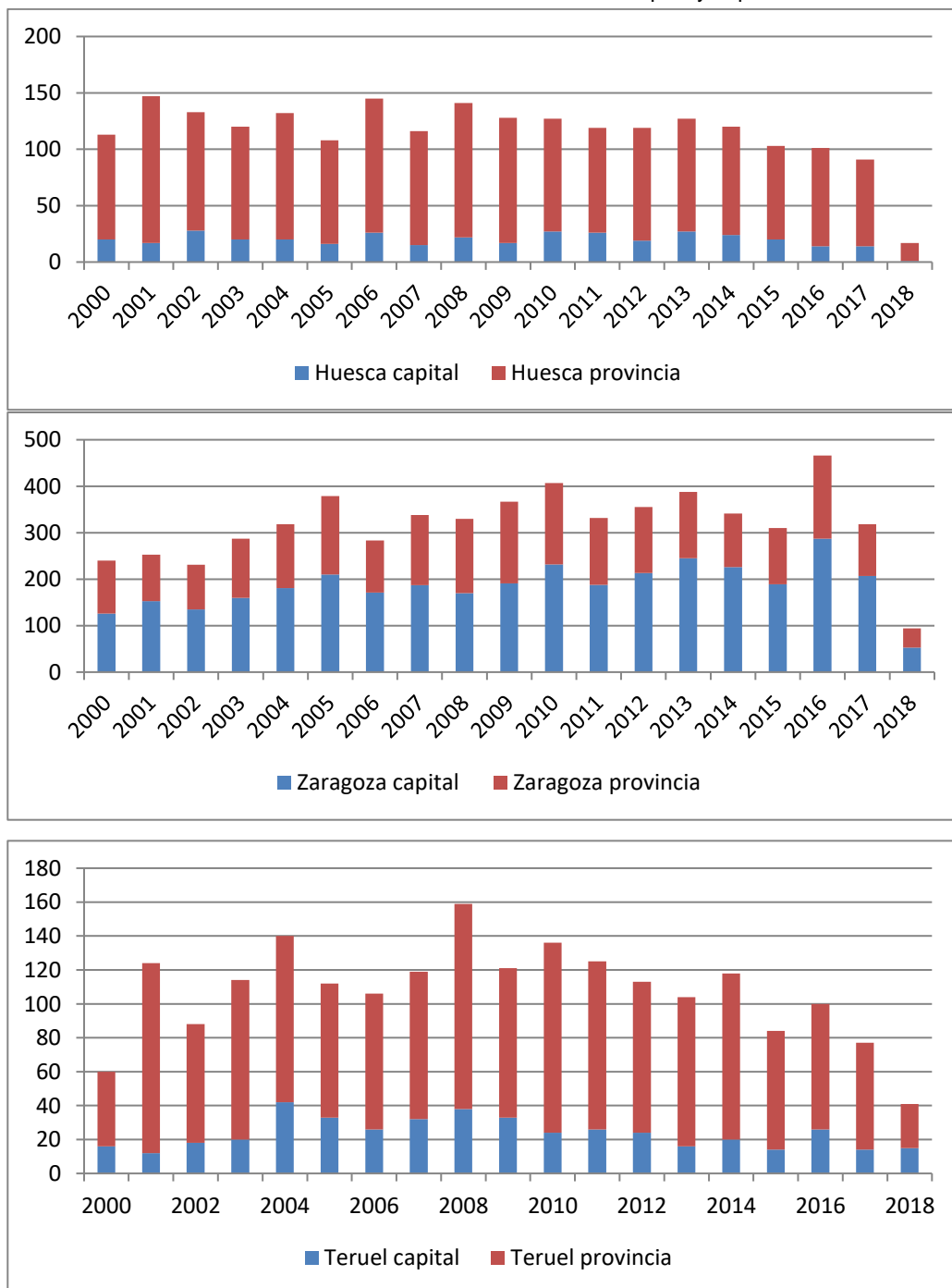
Tabla 2. Distribución asociaciones creadas distinguiendo la capital del resto provincia

AÑO CREACION	HUESCA			ZARAGOZA			TERUEL			TOTAL ARAGON
	TOTAL	HUESCA CAPITAL	HUESCA PROVINCIA	TOTAL	ZARAGOZA CAPITAL	ZARAGOZA PROVINCIA	TOTAL	TERUEL CAPITAL	TERUEL PROVINCIA	
2000	113	20	93	240	126	114	60	16	44	413
2001	147	17	130	253	153	100	124	12	112	524
2002	133	28	105	231	135	96	88	18	70	452
2003	120	20	100	287	160	127	114	20	94	521
2004	132	20	112	318	181	137	140	42	98	590
2005	108	16	92	379	210	169	112	33	79	599
2006	145	26	119	283	171	112	106	26	80	534
2007	116	15	101	338	187	151	119	32	87	573
2008	141	22	119	330	170	160	159	38	121	630
2009	128	17	111	367	191	176	121	33	88	616
2010	127	27	100	407	232	175	136	24	112	670
2011	119	26	93	332	188	144	125	26	99	576
2012	119	19	100	355	213	142	113	24	89	587
2013	127	27	100	388	245	143	104	16	88	619
2014	120	24	96	341	226	115	118	20	98	579
2015	103	20	83	310	189	121	84	14	70	497
2016	101	14	87	466	287	179	100	26	74	667
2017	91	14	77	318	207	111	77	14	63	486
2018	17	1	16	94	53	41	41	15	26	152
TOTAL	2.207	373	1.834	6.037	3.524	2.513	2.041	449	1.592	10.285

Fuente: elaboración propia a partir de datos del Registro General de Asociaciones de la Comunidad Autónoma de Aragón.

Esto nos proporciona información (ver gráfico 2) para poder afirmar que el comportamiento asociacionista de los de los aragoneses es diferente en función del tamaño del municipio en que residen. En Zaragoza hay un mayor asociacionismo en la capital (que como veremos más adelante, cuenta lógicamente con una mayor población) mientras que en Huesca y Teruel, es más frecuente el asociacionismo en el entorno rural, que como veremos a continuación cuenta con muchos municipios de reducido tamaño.

Gráfico 2. Distribución de asociaciones creadas en la capital y la provincia.



Fuente: elaboración propia a partir de datos del Registro General de Asociaciones de la Comunidad Autónoma de Aragón.

Tal y como comentábamos antes, la Comunidad Autónoma de Aragón presenta una población muy diseminada a lo largo de todo el territorio, con unas capitales de provincia de tamaño muy dispar. En el año 2018, Zaragoza capital tiene 666.880 habitantes (de un total de la provincia de 954.811 habitantes), Huesca capital tiene 52.463 habitantes (de un total de la provincia de 219.345 habitantes) y Teruel capital tiene 35.691 habitantes (de un total de la provincia de 134.572 habitantes)

En la Tabla 3, se muestra el número de municipios existentes en cada una de las tres provincias aragonesas en el 2018, observándose que son los municipios de menor tamaño los más frecuentes en toda la Comunidad y que hay muy pocas localidades de gran tamaño en Aragón. Por eso, y para distinguir las capitales de provincia del resto, en el trabajo analizaremos las capitales de provincia por separado, para poder establecer conclusiones.

Tabla 3. Distribución del número de municipios por zonas. Año 2018

Año 2018	Municipios de 0 a 2.000 habitantes (Zona rural)	Municipios de 2.001 a 10.000 habitantes (Zona intermedia)	Municipios de más de 10.001 habitantes (Zona urbana)
Provincia de Huesca	189	8	5
Provincia de Zaragoza	259	28	6
Provincia de Teruel	225	9	2

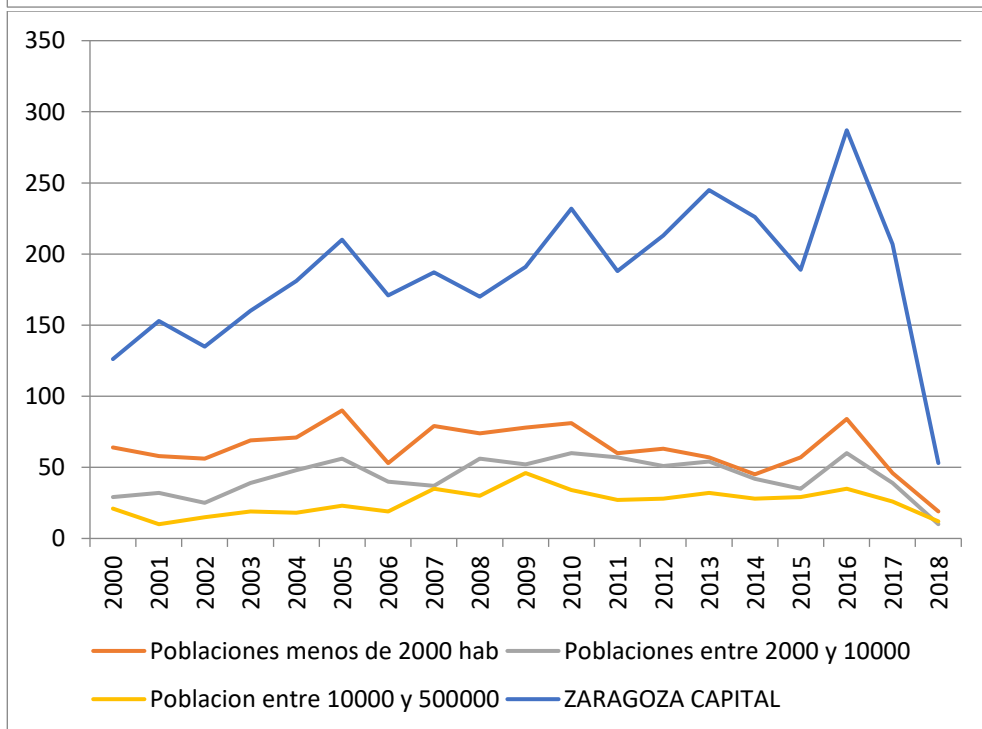
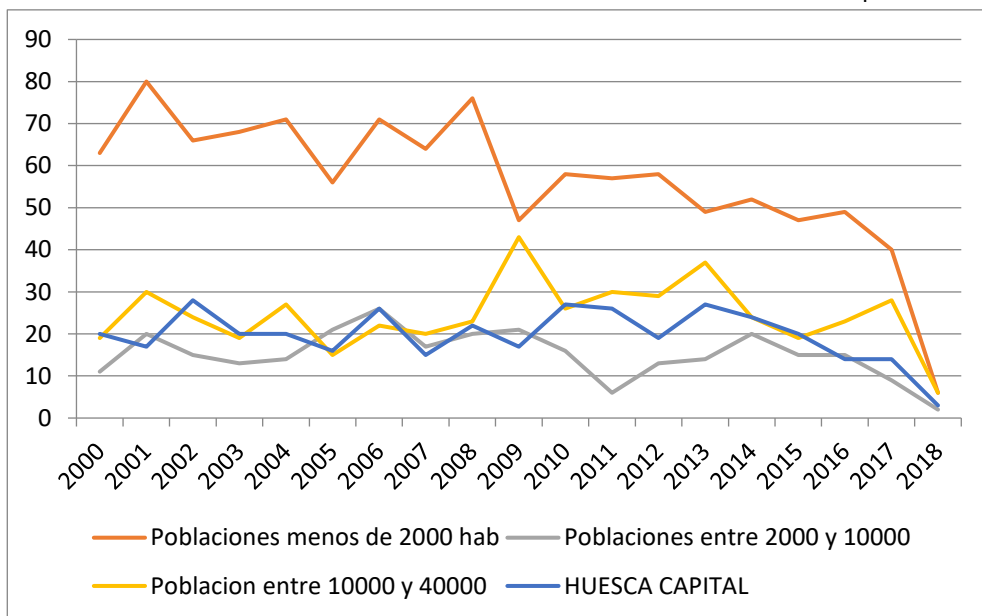
Fuente: Instituto Aragonés de Estadística

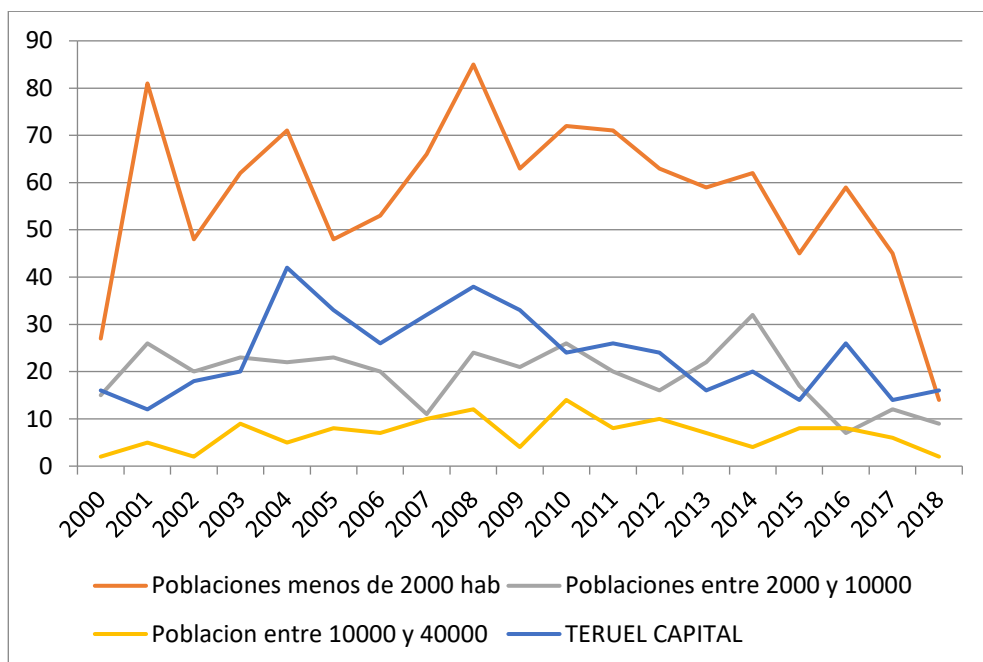
Para profundizar en uno de los objetivos del trabajo, el siguiente aspecto que queremos considerar es si el comportamiento asociacionista de los aragoneses es diferente en función del tamaño del municipio en el que la asociación ha sido creada, a partir de la distribución realizada en la Tabla 3.

En el Gráfico 3, analizamos la evolución en el número de asociaciones, distinguiendo entre municipios de 0 a 2.000 habitantes (zona rural), municipios de 2001 a 10.000 habitantes (zona intermedia) y aquellos de más de 10.000 habitantes (zona urbana) tal y como establece el Instituto Aragonés de Estadística. A este último grupo de más de 10.000 habitantes, hemos añadido las tres capitales de provincia por separado ya que nos proporciona información muy valiosa acerca del comportamiento de los aragoneses en los principales núcleos de población de la Comunidad Autónoma.

Se observa que Huesca y Teruel, vuelven a mostrar un comportamiento similar. En ambos casos, son los municipios de menos de 2.000 habitantes (los más frecuentes en ambas provincias) los que crean un mayor número de asociaciones, mientras que en Zaragoza es la capital la que más asociaciones crea.

Gráfico 3. Distribución asociaciones creadas en función tamaño municipio





Fuente: elaboración propia a partir de los datos del registro General de Asociaciones y del Instituto nacional de Estadística

3. FINALIDAD DE LAS ASOCIACIONES CREADAS

Las asociaciones son entidades sin ánimo de lucro que se constituyen mediante acuerdo de tres o más personas físicas o jurídicas legalmente constituidas, que se comprometen a poner en común conocimientos, medios y actividades para alcanzar unos fines lícitos de interés general o particular.

La diversidad y heterogeneidad de las asociaciones es muy amplia. Dentro del concepto de asociación encaja una variada tipología de entidades. Por un lado, las que podemos considerar de régimen común y, por otro, aquellas de régimen específico que vienen singularizadas por la naturaleza de sus fines (partidos políticos; sindicatos; organizaciones empresariales; iglesias, confesiones y comunidades religiosas; asociaciones deportivas; asociaciones de consumidores y usuarios; y asociaciones profesionales de miembros de las Fuerzas Armadas, de la Guardia Civil y de magistrados, jueces y fiscales).

Si atendemos a sus fines estos pueden ser desde temas culturales, servicios sociales, educativos desarrollo económico, defensa de derechos humanos, dirigidas a colectivos de personas en exclusión o en riesgo de exclusión o también ser organizaciones elitistas y que se crean desde un modelo de exclusión de los otros o como se conoce habitualmente tipo club.

Esta diversidad en el fondo es un reflejo de los intereses y características de la población de un territorio. En general, la ayuda mutua es una de las razones principales para la creación de asociaciones. Las entidades de personas afectadas

por una enfermedad, la falta de servicios básicos (educativos, sociales, sanitarios) para una población hace que las personas decidan crear una asociación donde poder resolver las necesidades más inmediatas y poder defender sus intereses.

No existen muchos trabajos que analicen la distribución de asociaciones según su finalidad.

En Marcuello (1998) se analizan las 15.691 asociaciones existentes en Cataluña en el año 1991. De ellas el 52,4% pertenecen al ámbito cultural, de educación y de servicios sociales. El número de asociaciones por cada 1.000 habitantes asciende a 5,32.

Así, en el trabajo de Ruiz Olabuénaga, (2001) se clasifican las 174.916 asociaciones existentes en España en 1995, en once grupos, tal y como muestra la tabla 4. Destacan las asociaciones culturales (50,4% del total), y las de educación (14,86%).

Tabla 4. Distribución organizaciones no lucrativas según sectores de Clasificación ICNPO

	Asociaciones
1.Cultura, deporte y ocio	88.328
2.Educación e investigación	25.999
3.Salud	1.834
4.Servicios sociales	6.472
5.Medio ambiente	5.508
6.Desarrollo comunitario y vivienda	20.496
7.Derechos civiles	15.334
8.Intermediarios filantrópicos	0
9.Actividades internacionales	500
10.Asociaciones Profesionales	10.445
11.Mutualidades de Previsión Social	0
TOTAL	174.916

Fuente: Ruiz Olabuénaga (2001)

En el trabajo de Bellostas et al (2002) se realiza un análisis exhaustivo de las asociaciones creadas en Aragón hasta el año 2000, destacando un predominio de las actividades culturales, de ocio y deportivas por encima de todas las demás. Seguidas de un grupo numeroso de organizaciones cuyas actividades son la educación, formación e investigación junto con las denominadas de servicios sociales. El trabajo, también hace un análisis en cada una de las provincias. En el caso de Huesca se introducen algunas modificaciones relevantes respecto de los puestos destacados, incorporándose las organizaciones de desarrollo comunitario y las de servicios sociales resaltan detrás de las culturales. En Zaragoza, destaca el alto número de organizaciones deportivas y el peso de las profesionales. En Teruel prevalecen las asociaciones del campo de la cultura y el ocio (54,63%), las de servicios sociales (17,44%) y las de educación (14,15%).

En el trabajo de Sajardo (2004) se analiza la distribución por actividades económicas de las asociaciones españolas en 2002 (ver Tabla 5). Este autor clasifica las asociaciones en 10 grupos: Varias, Culturales e ideológicas,

deportivas, recreativas y juveniles, Disminuidos físicos y psíquicos, Económicas y profesionales, Familiares, consumidores y tercera edad, Femeninas, Filantrópicas, Educativas y Vecinos. Son las actividades teóricamente de mayor contenido lúdico y de encuentro, como los de Culturales e ideológicas y Deportivas, recreativas y juveniles las que concentraban la mitad del asociacionismo de nuestro país en 2002 (54,3%).

Tabla 5. Asociaciones clasificadas por Grupos de Actividad a 31-12-2002

Grupos de Actividades Económicas	Asociaciones	%
0. Varias	2.236	0,9%
1. Culturales e ideológicas	97.725	37,7%
2. Deportivas, recreativas y juveniles	43.143	16,6%
3. Disminuidos físicos y psíquicos	5.486	2,1%
4. Económicas y profesionales	18.803	7,2%
5. Familiares, consumidores y tercera edad	12.138	4,7%
6. Femeninas	8.412	3,2%
7. Filantrópicas	14.799	5,7%
8. Educativas	29.313	11,3%
9. Vecinos	27.300	10,5%
Totales	259.355	

Fuente: Sajardo (2004)

No existen muchos trabajos que analicen el tipo de finalidad de las asociaciones creadas en un territorio. Así, por ejemplo, el Barómetro del Tercer Sector Social de 2016 de Cataluña clasifica las entidades en función del tipo de atención que ofrecen, destacando la atención psicosocial (15,40%), la educación (14, 50%) y los centros de día (12,13%).

3.1. EVOLUCION DEL Nº DE ASOCIACIONES CREADAS EN ARAGON SEGÚN SU FINALIDAD

Como ya se comentó en la introducción, el Registro General de Asociaciones del Gobierno de Aragón proporciona información acerca de las asociaciones creadas, la fecha de creación, el lugar de creación y los fines de la entidad.

En este epígrafe vamos a centrarnos en la finalidad de las asociaciones creadas en nuestra Comunidad y si existen o han existido diferencias a lo largo de los últimos dieciocho años. Esto nos permitirá conocer en profundidad el tejido asociativo de la Comunidad Autónoma como fuente fundamental para la creación de capital social. Este capital social es el que va a favorecer la creación de proyectos comunes enraizados en el territorio y en las necesidades de las personas para dar respuesta a los diferentes problemas y necesidades de los distintos colectivos y alcanzar, de este modo, mejores cotas de bienestar (Marcuello et al, 2016).

En este trabajo vamos a emplear la Clasificación Internacional de las Entidades No Lucrativas (ICNPO) realizada por Salamon y Anheier (1992 y 1994) bajo el proyecto de investigación de la Universidad de Johns Hopkins recomendado por la ONU en su Manual de instituciones sin fines de lucro, que clasifica este tipo de entidades en los doce sectores de actividad siguientes: 1) Cultura, deporte y ocio; 2) Educación e investigación; 3) Salud; 4) Servicios sociales; 5) Medio ambiente; 6) Desarrollo comunitario y vivienda; 7) Derechos civiles, asesoramiento legal y política; 8) Intermediarios filantrópicos y promoción del voluntariado; 9) Actividades internacionales; 10) Religión; 11) Asociaciones profesionales, empresariales y sindicatos; 12) Otros. A través de ella, no se trata tanto de buscar comportamientos genéricos de las organizaciones no lucrativas, como de proporcionar un catálogo de actividades con el fin de facilitar su cuantificación en las estadísticas económicas. En la tabla 6, se muestran los doce grupos de clasificación que se proponen:

Tabla 6. Clasificación internacional de las Entidades No Lucrativas

CLASIFICACION INTERNACIONAL DE ASOCIACIONES	
GRUPO 1	Cultura y entretenimiento
1.100	Cultura
1.200	Deporte
1.300	Clubs de servicios /Otros
GRUPO 2	Educación e investigación
2.100	Educación primaria y secundaria
2.200	Educación superior
2.300	Otra educación
2.400	Investigación
GRUPO 3	Salud
3.100	Hospitales y rehabilitación
3.200	Clinicas de reposo
3.300	Salud mental
3.400	Otros servicios médicos
GRUPO 4	Servicios sociales
4.100	Servicios sociales
4.200	Asistencia preventiva y emergencias
4.300	Ayuda a los estratos desfavorecidos económicamente
GRUPO 5	Medio ambiente
5.100	Entorno
5.200	Animales
GRUPO 6	Servicios cívicos
6.100	Desarrollo económico, social y comunitario
6.200	Vivienda
6.300	Formación y empleo
GRUPO 7	Ley, defensa y política
7.100	Derechos civiles y su defensa
7.200	Servicios jurídicos
7.300	Organizaciones políticas
GRUPO 8	Intermediarios filantrópicos y promoción del voluntariado
8.100	Intermediarios y promociones filantrópicos de Voluntariado
GRUPO 9	Internacional
9.100	Actividades Internacionales
GRUPO 10	Religión
10.100	Congregaciones religiosas y asociaciones
GRUPO 11	Asociaciones profesionales
11.100	11.100 Asociaciones profesionales y uniones
GRUPO 12	Otros

Fuente: Salamon y Anheier (1992)

Tal y como ya hicimos en el epígrafe anterior, la información de la que disponemos gracias al registro nos permite conocer la denominación de cada una de las asociaciones creadas en Aragón. A partir de dicha información, se ha procedido a codificar cada una de las asociaciones con un código atendiendo a dicha clasificación internacional.

En la Tabla 7, se muestran los datos para la Comunidad Autónoma del número de asociaciones creadas desde el año 2000 en cada uno de los grupos que distingue la INCPO. Se observa como son las asociaciones pertenecientes al *Grupo 1.Cultura y entretenimiento* las más frecuentes a lo largo de todos los periodos analizados, llegando a suponer en los últimos años casi dos tercios del total . A continuación, las asociaciones del *Grupo 4.Servicios sociales* y *Grupo 7.Ley, defensa y política*.

Tabla 7. Distribución de las asociaciones en Aragón por finalidad 2000-2018

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
FIN 1	217	222	192	253	327	359	312	341	398	395	444	351	395	393	340	309	409	320	56
	52,5%	42,4%	42,5%	48,6%	55,4%	59,9%	58,4%	59,5%	63,2%	64,1%	66,4%	60,9%	67,3%	63,5%	58,7%	62,2%	61,4%	65,8%	54,4%
FIN 2	17	15	15	16	17	28	23	20	29	24	28	17	26	25	17	20	23	15	7
FIN 3	11	12	6	7	10	13	1	4	3	3	6	8	5	15	9	10	32	21	2
FIN 4	46	50	34	38	45	50	42	61	35	66	67	56	49	49	60	40	48	18	12
	11,1%	9,5%	7,5%	7,3%	7,6%	8,3%	7,9%	10,6%	5,6%	10,7%	10,0%	9,7%	8,3%	7,9%	10,4%	8,0%	7,2%	3,7%	11,7%
FIN 5	10	74	68	30	40	19	17	21	25	13	24	19	20	36	30	24	24	19	7
	2,4%	14,1%	15,0%	5,8%	6,8%	3,2%	3,2%	3,7%	4,0%	2,1%	3,6%	3,3%	3,4%	5,8%	5,2%	4,8%	3,6%	3,9%	6,8%
FIN 6	45	40	36	39	61	44	52	39	57	31	26	43	38	40	44	34	35	20	6
	10,9%	7,6%	8,0%	7,5%	10,3%	7,3%	9,7%	6,8%	9,0%	5,0%	3,9%	7,5%	6,5%	6,5%	7,6%	6,8%	5,3%	4,1%	5,8%
FIN 7	41	76	76	100	56	60	55	59	48	54	42	37	22	27	40	38	49	40	7
	9,9%	14,5%	16,8%	19,2%	9,5%	10,0%	10,3%	10,3%	7,6%	8,8%	6,3%	6,4%	3,7%	4,4%	6,9%	7,6%	7,4%	8,2%	6,8%
FIN 8	1	4	2	4	2	5	6	4	5	5	2	2	5	4	0	3	1	1	0
FIN 9	1	6	4	6	7	4	5	9	13	5	9	20	10	13	9	9	14	15	3
FIN 10	10	7	5	7	5	9	2	2	4	2	4	3	5	3	1	3	4	7	0
FIN 11	13	14	9	21	19	8	18	13	11	18	13	15	8	14	23	6	25	8	1
FIN 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sin fin	1	4	5	0	1	0	1	0	2	0	4	5	4	0	6	1	2	2	2
	413	524	452	521	590	599	534	573	630	616	669	576	587	619	579	497	666	486	103

Fuente: elaboración propia

Una vez visto cual es la situación en la Comunidad Autónoma, nuestro objetivo es profundizar en el proceso de creación en cada una de las tres provincias aragonesas y, detectar, si las hubiera, diferencias en la tipología de las asociaciones creadas.

En la provincia de Huesca (ver tabla 8) son las asociaciones del *Grupo 1.Cultura y entretenimiento*, el más frecuente aunque con menos peso que en Aragón, en segundo lugar son el *Grupo 6 Servicios cívicos* y el *Grupo 7.Ley, defensa y política* los más empleados en la provincia. Además, algún tipo de asociación sólo existe en el mundo rural: asociaciones de derechos civiles (Grupo 7), servicios cívicos (Grupo 6), educación (Grupo 2) y actividades internacionales (Grupo 9).

Tabla 8. Distribución asociaciones en Huesca por finalidad 2000-2018

AÑO	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	TOTAL	
GRUPO 1	60	45	50	46	74	55	67	68	72	83	71	59	74	75	64	51	58	48	9	1.129	51,02%
	53,1%	30,6%	37,6%	38,3%	54,8%	49,5%	46,2%	58,6%	51,1%	64,8%	55,9%	49,6%	62,2%	59,1%	53,3%	49,5%	57,4%	52,7%	52,9%		
GRUPO 2	8	6	8	7	6	9	9	5	8	2	6	2	8	8	5	9	5	5	1	117	5,29%
GRUPO 3	0	0	0	0	1	0	1	0	0	0	2	2	1	0	3	1	1	1	0	13	0,59%
GRUPO 4	12	10	5	4	7	8	17	6	7	8	11	12	7	12	10	8	8	3	1	156	7,05%
	10,6%	6,8%	3,8%	3,3%	5,2%	7,2%	11,7%	5,2%	5,0%	6,3%	8,7%	10,1%	5,9%	9,4%	8,3%	7,8%	7,9%	3,3%	5,9%		
GRUPO 5	2	47	21	16	8	2	7	6	6	3	9	7	7	18	3	5	3	5	1	176	7,95%
GRUPO 6	21	18	19	18	17	17	25	17	22	10	6	10	10	4	13	10	11	6	0	254	11,48%
	18,6%	12,2%	14,3%	15,0%	12,6%	15,3%	17,2%	14,7%	15,6%	7,8%	4,7%	8,4%	8,4%	3,1%	10,8%	9,7%	10,9%	6,6%	0,0%		
GRUPO 7	5	11	17	18	12	11	12	6	18	15	10	14	4	9	12	12	8	15	4	213	9,62%
	4,4%	7,5%	12,8%	15,0%	8,9%	9,9%	8,3%	5,2%	12,8%	11,7%	7,9%	11,8%	3,4%	7,1%	10,0%	11,7%	7,9%	16,5%	23,5%		
GRUPO 8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	0,09%
GRUPO 9	0	2	3	5	3	5	2	5	4	3	5	5	3	1	4	6	3	5	0	64	2,89%
GRUPO 10	4	0	3	2	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	12	0,54%
GRUPO 11	1	4	4	4	6	3	5	3	2	4	4	3	1	0	1	1	3	1	1	51	2,30%
GRUPO 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,00%
NO FIN	0	4	3	0	1	0	0	0	2	0	3	3	3	0	5	0	1	1	0	26	1,17%
TOTAL	113	147	133	120	135	111	145	116	141	128	127	119	119	127	120	103	101	91	17	2.213	

Fuente: elaboración propia

Las asociaciones pertenecientes al Grupo 1.Cultura y entretenimiento son las más abundantes en la provincia de Zaragoza (ver Tabla 9). En la actualidad representan más de la mitad del total. Las asociaciones de salud (grupo 3) son prácticamente inexistentes en el resto de la comunidad autónoma, trece en Huesca y dieciséis Teruel. Quizá la causa sea que los hospitales de referencia en Aragón se encuentran en Zaragoza capital.

Tabla 9. Distribución asociaciones en Zaragoza por finalidad 2000-2018

AÑO	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	TOTAL	
GRUPO 1	121 50,4%	113 44,7%	104 45,0%	142 49,5%	160 50,3%	219 57,8%	166 58,7%	187 55,3%	211 63,9%	213 58,0%	264 64,9%	201 60,5%	224 63,1%	233 60,1%	183 53,8%	191 61,8%	271 58,3%	208 65,6%	49 52,1%	3460	57,35%
GRUPO 2	8	7	6	9	8	18	9	13	13	17	20	13	16	15	9	7	18	10	6	222	3,68%
GRUPO 3	9	10	6	6	8	13	0	4	3	3	3	5	3	12	6	9	30	19	2	151	2,50%
GRUPO 4	31 12,9%	36 14,2%	25 10,8%	26 9,1%	30 9,4%	35 9,2%	22 7,8%	43 12,7%	18 5,5%	53 14,4%	54 13,3%	35 10,5%	40 11,3%	34 8,8%	48 14,1%	32 10,4%	34 7,3%	12 3,8%	12 12,8%	620	10,28%
GRUPO 5	7	15	40	9	25	17	6	11	12	7	9	8	13	17	20	16	18	11	6	267	4,43%
GRUPO 6	19 7,9%	17 6,7%	14 6,1%	13 4,5%	39 12,3%	27 7,1%	21 7,4%	15 4,4%	29 8,8%	18 4,9%	16 3,9%	24 7,2%	24 6,8%	32 8,2%	28 8,2%	19 6,1%	22 4,7%	13 4,1%	6 6,4%	396	6,56%
GRUPO 7	33 13,8%	40 15,8%	27 11,7%	67 23,3%	28 8,8%	36 9,5%	38 13,4%	47 13,9%	24 7,3%	35 9,5%	26 6,4%	21 6,3%	13 3,7%	14 3,6%	21 6,2%	23 7,4%	36 7,7%	21 6,6%	6 6,4%	556	9,22%
GRUPO 8	1	4	2	4	2	5	6	4	5	5	2	1	5	4	0	3	1	0	0	54	0,90%
GRUPO 9	1	2	1	1	4	1	3	4	8	2	3	14	5	12	5	3	11	10	3	93	1,54%
GRUPO 10	1	0	0	0	2	3	1	1	0	0	0	0	3	3	0	1	2	6	1	24	0,40%
GRUPO 11	9	9	5	10	12	5	11	9	7	14	9	9	8	12	20	5	22	7	1	184	3,05%
NO FIN	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	2	6	0,10%
TOTAL	240	253	231	287	318	379	283	338	330	367	407	332	355	388	340	309	465	317	94	6033	

Fuente: elaboración propia

En la tabla 10, se muestra la distribución de asociaciones en la provincia de Teruel, en donde destaca que las asociaciones del Grupo 1.Cultura y entretenimiento representan este último año un 70% aunque han llegado a representar más del 85%. A continuación, con un peso menor del 10% cada uno de ellos, le siguen el Grupo 7. Ley, defensa y política y Grupo 4. Servicios sociales.

Tabla 10. Distribución asociaciones en Teruel por finalidad 2000-2018

AÑO	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	TOTAL	
GRUPO 1	36	64	36	65	94	80	80	86	115	99	113	94	100	87	96	69	86	64	29	1.493	72,20%
	60,0%	51,6%	40,9%	57,0%	67,1%	71,4%	74,8%	72,3%	72,3%	81,8%	80,7%	72,9%	85,5%	82,1%	78,0%	80,2%	80,4%	85,3%	70,7%		
GRUPO 2	1	2	3	0	4	2	5	2	8	5	2	2	2	2	3	4	0	0	1	48	2,32%
GRUPO 3	2	2	0	1	1	0	0	0	0	0	1	1	1	3	0	0	1	0	3	16	0,77%
GRUPO 4	3	4	4	8	8	7	3	12	10	5	2	9	2	3	2	0	6	3	2	93	4,50%
	5,0%	3,2%	4,5%	7,0%	5,7%	6,3%	2,8%	10,1%	6,3%	4,1%	1,4%	7,0%	1,7%	2,8%	1,6%	0,0%	5,6%	4,0%	4,9%		
GRUPO 5	1	14	7	5	7	2	4	4	7	3	7	4	0	1	7	3	3	3	2	84	4,06%
	1,7%	11,3%	8,0%	4,4%	5,0%	1,8%	3,7%	3,4%	4,4%	2,5%	5,0%	3,1%	0,0%	0,9%	5,7%	3,5%	2,8%	4,0%	4,9%		
GRUPO 6	5	3	3	8	6	2	6	7	6	3	4	9	4	4	3	5	2	1	1	82	3,97%
GRUPO 7	3	25	32	15	16	13	5	6	6	4	6	4	6	4	9	3	5	2	3	167	8,08%
	5,0%	20,2%	36,4%	13,2%	11,4%	11,6%	4,7%	5,0%	3,8%	3,3%	4,3%	3,1%	5,1%	3,8%	7,3%	3,5%	4,7%	2,7%	7,3%		
GRUPO 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,00%
GRUPO 9	0	2	0	0	0	0	0	0	1	0	1	1	1	0	0	0	1	0	0	7	0,34%
GRUPO 10	9	7	2	5	3	6	1	1	4	2	4	2	1	0	1	2	2	2	0	54	2,61%
GRUPO 11	0	1	0	7	1	0	2	1	2	0	0	3	0	2	2	0	0	0	0	21	1,02%
GRUPO 12	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0,10%
NO FIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0,05%
TOTAL	60	124	88	114	140	112	107	119	159	121	140	129	117	106	123	86	107	75	41	2068	

Fuente: elaboración propia

Hasta aquí, hemos analizado si existen diferencias en el comportamiento asociacionista a lo largo de los años (ver tabla 1), distinguiendo la capital de la provincia del resto de la provincia (ver tabla 2), en función del tamaño de la localidad en donde se ha creado la asociación (ver gráfico 3) y por la finalidad de la asociación (ver tablas 7,8, 9 y 10).

Por tanto, nos falta cruzar todas las variables anteriores para conocer el número de asociaciones creadas a lo largo de todos los años analizados, en cada municipio y con qué finalidad. Así en las siguientes tablas, se muestra la evolución en cada una de las tres provincias, distinguiendo por el tamaño del municipio en donde se ha creado la asociación, y la finalidad de la misma.

Tabla 11. Distribución asociaciones por localización y finalidad en Huesca 2000-2018

AÑO	POBLACIONES MENOS DE 2.000 HABITANTES												POBLACIONES ENTRE 2.000 y 10.000 HABITANTES												TOTAL		
	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	sin fin	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	SIN FIN			
2000	33	6	0	3	2	13	3	0	0	0	2	1	63	6	0	0	2	0	2	0	0	0	1	0	11		
2001	16	4	0	2	34	14	6	0	0	0	3	1	80	7	0	0	3	5	1	2	0	0	1	1	20		
2002	27	3	0	1	13	11	5	0	1	2	1	2	66	4	2	0	0	3	0	3	0	1	0	2	15		
2003	24	2	0	1	11	12	14	0	2	0	2	0	68	7	0	0	0	3	2	0	0	0	1	0	13		
2004	35	3	0	4	7	11	9	0	0	0	2	0	71	11	0	0	1	0	0	1	0	1	0	0	14		
2005	26	6	0	4	0	12	8	0	0	0	0	0	56	14	0	0	1	0	2	2	0	1	0	1	21		
2006	27	3	0	11	1	20	6	0	0	0	3	0	71	16	4	0	2	1	1	1	0	0	1	0	26		
2007	42	1	0	0	4	11	3	0	1	0	2	0	64	9	2	0	1	1	2	0	0	1	0	1	17		
2008	36	5	0	2	4	16	12	0	0	0	0	1	76	10	2	0	1	1	2	2	0	1	0	1	20		
2009	32	0	0	4	1	3	5	0	0	0	2	0	47	13	0	0	1	0	2	4	0	0	1	0	21		
2010	36	1	0	5	4	5	4				2	1	58	5	2	1	3	2	0	2	0	0	0	1	16		
2011	29	1	1	2	5	8	7	1	1	1		1	57	3							2			1	6		
2012	36	2		3	5	6	3			1	1	1	58	7		1	1	2			1			1	13		
2013	32	2		2	6	3	4						49	11		1	2								14		
2014	30	3		3	2	8	3		1			2	52	11	1		1		3	2	0	1		1	20		
2015	27	2		1	3	7	6		1				47	9	1		1	1	1			4			17		
2016	30	2		3	2	8	3				1		49	7		1	1		1	4		1			15		
2017	21	3			2	3	9	1	1				40	3			1	1	2		1		1		9		
2018	3						3						6	1	1										2		
AÑO	POBLACIONES ENTRE 10.000 y 40.000 HABITANTES												POBLACIONES MAS DE 40.000 HABITANTES (CAPITAL)												TOTAL		
	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	SIN FIN	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	SIN FIN			
2000	11	1	0	4	0	2	0				1		19	10	1	0	3	0	4	2	0	0	0	0	20	113	
2001	12	1		3	6	3	3	0	1			1	30	10	1	0	2	0	2		0	1		1	17	147	
2002	14			3	2	4					1		24	7	1	0	1	3	4	9	0	1	1	1	28	133	
2003	9	2	0	1	1	3	2	0	1				19	6	3	0	2	1	1	2	0	2	1	2	20	120	
2004	14	1	0	2	1	3	2	0	1		2	1	27	13	1	1			2			1		2	20	132	
2005	7	1	0	1	0	1	1	0	2	1	1		15	13	1		2			0					16	108	
2006	9	1	1	1	3	3	2	0	1		1		22	15	1		3	2	1	3	0	1			26	145	
2007	11	1	0	3	0	3	2						20	6	1	0	2	1	1	1	0	3			15	116	
2008	12			3	1	2	1		2		1	1	23	14	1		1		2	3	0	1			22	141	
2009	25	1		2	2	4	5		3		1	0	43	13	1	0	1		1	1	0				17	128	
2010	14	2		1	2		3		3		1		26	16	1	1	2	1	1	1	0	2		1	1	27	127
2011	17	1		5		1	3		1		2		30	10		1	5	2	1	3	0	1		1	2	26	119
2012	22	2	1	1	1	2							29	9	4		2			1	0	2			1	19	119
2013	18	5		4	6	1	2		1				37	14	1		5	4		3	0					27	127
2014	11		1	3	1		4		1		1	2	24	12	1	2	3		2	3	0	1				24	120
2015	10	2	1	3	1		1		1				19	5	4		3		2	5	0			1		20	103
2016	14	1		1	1	2	1		1		1	1	23	7	2		3			0	1		1			14	101
2017	15	2		1		2	4		3			1	28	9		1	2	2			0					14	91
2018	4	0		0	1						1		6	1			1			1	0					3	16

Fuente: elaboración propia a partir de datos del Registro

Tabla 12. Distribución asociaciones por localización y finalidad en Zaragoza 2000-2018

AÑO	POBLACIONES MENOS DE 2.000 HABITANTES													POBLACIONES ENTRE 2.000 y 10.000 HABITANTES													TOTAL
	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	SIN FIN	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	SIN FIN			
2000	37	1	0	8	2	6	10	0	0	0	0	0	64	16	0	1	3	0	3	6	0	0	0	0	29		
2001	33	1	0	6	3	5	8	1	0	0	1	0	58	11	0	0	4	4	2	8	2	1	0	0	32		
2002	24	1	0	2	17	3	7	0	0	0	2	0	56	14	0	0	1	8	1	1	0	0	0	0	25		
2003	41	0	0	8	4	3	13	0	0	0	0	0	69	23	1	0	6	2	2	1	2	0	0	2	39		
2004	44	1	0	7	7	4	4	1	0	1	2	0	71	27	1	0	2	6	5	5	1	1	0	0	48		
2005	54	3	0	8	5	8	8	2	0	2	0	0	90	34	2	0	7	3	3	4	1	0	0	2	56		
2006	33	2	0	4	4	2	6	2	0	0	0	0	53	28	2	0	3	0	1	2	3	0	0	1	40		
2007	53	2	0	7	4	3	7	2	0	0	1	0	79	25	2	0	3	1	2	3	1	0	0	0	37		
2008	59	2	0	5	3	3	2	0	0	0	0	0	74	44	0	0	1	5	2	1	2	0	0	1	56		
2009	58	3	0	8	2	2	4	1	0	0	0	0	78	32	2	0	9	1	3	3	1	0	0	1	52		
2010	66	2	0	8	3	1	1	0	0	0	0	0	81	43	3	0	5	3	3	0	1	0	0	2	60		
2011	48	1	0	2	4	3	2	0	0	0	0	0	60	39	2	1	6	0	2	3	0	3	0	1	57		
2012	50	0	0	4	3	2	2	0	1	1	0	0	63	37	3	0	3	0	2	1	3	0	1	1	51		
2013	42	3	0	3	0	6	1	0	0	2	0	0	57	35	3	1	4	2	3	2	1	1	0	2	54		
2014	32	1	0	1	4	4	2	0	0	0	1	0	45	27	1	1	3	2	2	3	0	1	0	2	42		
2015	42	1	0	4	1	5	1	3	0	0	0	0	57	22	0	3	2	1	3	2	0	0	0	1	35		
2016	72	0	0	2	2	4	2	0	0	1	1	0	84	34	0	4	1	6	5	6	0	0	0	4	60		
2017	38	0	2	1	0	1	2	0	1	0	1	0	46	32	0	1	0	3	0	1	0	0	2	0	39		
2018	15	2	0	1	0	0	1	0	0	0	0	0	19	6	1	0	1	0	0	0	0	1	0	0	10		
AÑO	POBLACIONES ENTRE 10.000 y 500.000 HABITANTES													POBLACIONES MAS DE 500.000 HABITANTES													TOTAL
	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	SIN FIN	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	SIN FIN			
2000	14	0	2	1	1	1	1	0	0	0	1	0	21	54	7	6	19	4	9	16	1	1	1	8	0	126	240
2001	6	0	0	2	2	0	0	0	0	0	0	0	10	63	6	10	24	6	10	24	1	1	0	8	0	153	253
2002	4	0	0	3	5	0	1	2	0	0	0	0	15	62	5	6	19	10	10	18	0	1	0	3	1	135	231
2003	9	0	0	3	0	1	3	1	1	0	1	0	19	69	8	6	9	3	7	50	1	0	0	7	0	160	287
2004	6	0	0	0	6	2	4	0	0	0	0	0	18	83	6	8	21	6	28	15	0	3	1	10	0	181	318
2005	13	2	0	1	2	2	2	1	0	0	0	0	23	118	11	13	19	7	14	22	1	1	1	3	0	210	379
2006	11	1	0	4	0	1	2	0	0	0	0	0	19	94	4	0	11	2	17	28	1	3	1	10	0	171	283
2007	22	1	1	4	2	1	1	1	0	0	2	0	35	87	8	3	29	4	9	36	0	4	1	6	0	187	338
2008	18	1	0	2	1	2	2	1	3	0	0	0	30	90	10	3	10	3	22	19	2	5	0	6	0	170	330
2009	24	0	0	10	1	4	6	0	0	0	1	0	46	99	12	3	26	3	9	22	3	2	0	12		191	367
2010	23	1	1	4	1	1	1	1	0	0	1	0	34	132	14	2	37	2	11	24	0	3	0	6	1	232	407
2011	18	3	1	3	0	0	1	0	1	0	0	0	27	96	7	3	24	4	19	15	1	10	0	8	1	188	332
2012	20	0	0	3	0	2	0	1	1	1	0	0	28	117	13	3	30	10	18	10	1	4	0	6	1	213	355
2013	23	1	0	2	3	2	0	1	0	0	0	0	32	133	8	11	25	12	21	11	2	11	1	10	0	245	388
2014	17	1	0	2	1	3	4	0	0	0	0	0	28	107	6	5	42	13	19	12	0	4	0	17	1	226	341
2015	19	1	0	3	1	2	2	0	1	0	0	0	29	108	5	6	23	13	9	18	0	2	1	4	0	189	310
2016	21	2	0	3	0	0	7	0	0	1	1	0	35	144	16	26	28	10	13	21	1	11	0	16	1	287	466
2017	18	0	0	0	2	0	0	0	2	3	1	0	26	120	10	16	11	6	12	18	0	7	1	5	1	207	318
2018	10	0	0	0	1	0	0	0	1	0	0	0	12	20	3	2	10	5	6	5	0	1	0	0	1	53	94

Fuente: elaboración propia a partir de datos del Registro

Tabla 13. Distribución asociaciones por localización y finalidad en Teruel 2000-2018

AÑO	POBLACIONES MENOS DE 2.000 HABITANTES													POBLACIONES ENTRE 2.000 y 10.000 HABITANTES													
	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	FIN 12	sin fin	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	FIN 12	SIN FIN	
2000	21			1	1	1	1				2			27	6		1	1		1				6			15
2001	42	2		2	9	3	19				4			81	16				2		4		1	2	1		26
2002	14	1		3	6	1	22						1	48	9	1			1	1	6			2			20
2003	37			4	3	3	8				2	5		62	13			2	2	1	2			2	1		23
2004	45	2		6	4	3	9				1	1		71	13		1	1	1		4			2			22
2005	28	1		4	2	1	9				3			48	16			1		1	3			2			23
2006	38	4		2	3	3	3							53	14			1		1	2				1	1	20
2007	45	1		7	1	5	5				1	1		66	8			1	1		1						11
2008	63	2		5	6	2	5				1	1		85	17	2				1	1		1	2			24
2009	47	3		4	3	2	3				1		0	63	18	1				1				1			21
2010	61		1	1	3	2	1				2		1	72	23				1		1			1			26
2011	53	1		4	2	6	2				1	2		71	13	1		3	2						1		20
2012	55	2				4	2							63	14			1						1			16
2013	53					4	2							59	19	1		2									22
2014	54	1		1	2	3	1							62	21	1		1	4		3			1	1		32
2015	36	2			1	4	2							45	13					1	1			2			17
2016	44			4	3	2	3				2		1	59	7												7
2017	41				3		1							45	9			1		1	1						12
2018	13						1							14	5		1		2	1							9

AÑO	POBLACIONES ENTRE 10.000 y 40.000 HABITANTES											POBLACIONES MAS DE 40.000 HABITANTES (TERUEL CAPITAL)																
	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	SIN FIN	FIN 1	FIN 2	FIN 3	FIN 4	FIN 5	FIN 6	FIN 7	FIN 8	FIN 9	FIN 10	FIN 11	FIN 12		SIN FIN		
2000						1					1		2	9	1	1	1		2	2							16	60
2001	1			1	2		1						5	5		2	1	1		1		1	1				12	124
2002	2												2	11	1		1		1	4							18	88
2003	5			1		2					1		9	10		1	1		2	5			1				20	114
2004	2	1		1	1								5	34	1			1	3	3							42	140
2005	5			1			1				1		8	31	1		1										33	112
2006	4					1					1	1	7	23	1			1	1								26	106
2007	8			2									10	25	1		2	2	2								32	119
2008	4	4		2		1					1		12	31			3	1	2					1			38	159
2009	4												4	30	1		1			1							33	121
2010	8	1				1	2				1	1	14	17	1		1	2	1	2							24	136
2011	5					1					1	1	8	20		1	2		2	1							26	125
2012	6		1	1			2						10	22					1		1						24	113
2013	5		1				1						7	8	1	2	1	1		1				2			16	104
2014	3										1		4	15	1			1		3							20	118
2015	8												8	10	2			2									14	84
2016	8												8	21		1	2			2							26	100
2017	5										1		6	9		1	2			2							14	77
2018	2												2	9	1	2	2			2							16	41

Fuente: elaboración propia a partir de datos del Registro

En la tabla 11 se detalla las 2.207 asociaciones creadas en Huesca desde el año 2000, se puede constatar que son las asociaciones pertenecientes al Grupo 1.Cultura y entretenimiento las más abundantes en todos los municipios oscenses independientemente de su tamaño. Además, es reseñable, que en los municipios más pequeños son frecuentes las asociaciones del Grupo 6.Sercicios cívicos. En mayor medida que en el resto de municipios de Huesca.

En la tabla 12 que detalla las 6.037 asociaciones creadas en Zaragoza desde el año 2000, se puede constatar que las asociaciones pertenecientes al Grupo 1.Cultura y entretenimiento son las más abundantes en todos los municipios zaragozanos independientemente de su tamaño. Además, tal y como comentábamos al analizar los datos de la tabla 9, prácticamente todas las asociaciones del Grupo 3. Salud se localizan en la capital, lo que confirma su estrecha relación con la existencia de los principales hospitales y clínicas médicas de Aragón.

En la En la tabla 13 se detalla las 2.041 asociaciones creadas en Teruel desde el año 2000, se puede constatar que, de nuevo son las asociaciones pertenecientes al Grupo 1.Cultura y entretenimiento las más abundantes en todos los municipios turolenses independientemente de su tamaño. Además, es reseñable, el reducido número de asociaciones del Grupo 8. Intermediarios filantrópicos y Grupo 9. Internacional, que lógicamente se sitúan en su práctica totalidad en Zaragoza capital.

4. CONCLUSIONES

El objetivo de las asociaciones es dar respuesta a las necesidades comunes desde un proceso colectivo ofreciendo bienes y servicios tanto a sus socios como a personas externas a las mismas, siendo a su vez la concreción de uno de los derechos fundamentales de las personas. La creación de asociaciones nos permite valorar la capacidad de organizarse colectivamente de las personas de una sociedad determinada al igual que el resto de las figuras de la Economía social. Sin embargo, la particularidad de las asociaciones se debe a que no es necesario disponer de un capital inicial y los procedimientos para su creación son mucho más sencillos.

El objetivo de este trabajo es realizar un análisis descriptivo de la evolución de la creación de asociaciones en Aragón, durante el periodo 2000 a 2018 por localización y por finalidad. Para llevar a cabo este análisis se ha recurrido a la información disponible en el Registro General de Asociaciones del Gobierno de Aragón. En el momento de la creación de las asociaciones estas proporcionan información acerca de las asociaciones creadas, la fecha de creación, el lugar de creación y los fines de la entidad. Esto nos permite conocer la cronología de la evolución de la creación de asociaciones, conocer la localización exacta y la finalidad para la que ha sido creada.

En cuanto el proceso de creación de asociaciones en cada una de las tres capitales de provincia y el resto de la provincia. Así, se observa como en la provincia de Huesca y Teruel, la mayor parte de las asociaciones han sido creadas en la provincia (lo que podríamos denominar rural) con porcentajes que superan el 70% mientras que en Zaragoza, la situación es justo la contraria: la mayor parte de asociaciones zaragozanas han sido creadas en la capital de la provincia.

En términos absolutos, Zaragoza es la provincia en la que más asociaciones se crean (6.037 frente a las 2.707 de Huesca y las 2.041 de Teruel). Sin embargo, si consideramos la población a lo largo de los años en cada una de las tres provincias, comprobamos que, en contra de lo que se podía esperar tras el análisis en términos absolutos del número de asociaciones creadas, es Teruel la provincia con un mayor número de asociaciones creadas por habitante: en Teruel se han creado 5,53 asociaciones por cada 10.000 habitantes frente a los 4,14 de Huesca y 3,34 de Zaragoza (y 3,12 en Aragón).

Además, si distinguimos entre municipios de 0 a 2.000 habitantes (zona rural), municipios de 2001 a 10.000 habitantes (zona intermedia) y aquellos de más de 10.000 habitantes (zona urbana), considerando las capitales de provincia en otro cuarto grupo, observamos que en Huesca y Teruel, son los municipios de menos de 2.000 habitantes (los más frecuentes en ambas provincias) los que crean un mayor número de asociaciones, mientras que en Zaragoza es la capital la que más asociaciones crea.

Por último, si consideramos todas las variables: año, tamaño de la localidad y finalidad de la asociación, observamos que las asociaciones de tipo cultural y recreativas las más frecuentes siempre y cualquier localidad independientemente del tamaño. Destacar que en Zaragoza capital, el porcentaje de este tipo de asociaciones se sitúa en torno al 50% mientras que lo habitual en el resto de la provincia de Zaragoza y en Huesca y Teruel en su totalidad, se sitúa en torno al 70% o más.

Para futuras investigaciones, trataremos de incluir las características socioeconómicas de la población aragonesa, como son, la estructura de edad de la población, su nivel de ingresos, el nivel de cohesión social, el nivel de pobreza, la diversidad cultural...entre otros, para poder profundizar en si existen diferencias o no en el comportamiento asociacionista de los aragoneses en función de la localidad en la que residen.

REFERENCIAS

BARÓMETRO DEL TERCER SECTOR SOCIAL (2016).Informe de resultados. Mesa de entidades del Tercer Sector Social de Cataluña

BELLOSTAS, A. MARCUELLO, C. MARCUELLO, CH. Y MONEVA, J.M. (2002): Mimbres de un País. Sociedad Civil y Sector No Lucrativo en Aragón, Prensas Universitarias, Zaragoza, 84-7733-607-5.

Ley 5/2011, de 29 de marzo, de Economía Social, BOE nº 76, de 30 de marzo de 2011 y actualización de 10 de septiembre de 2015. Texto consolidado: <https://www.boe.es/buscar/act.php?id=BOE-A-2011-5708>

MARCUELLO SERVÓS, C. (1998): Determinants of the non-profit sector size. An Empirical Analysis in Spain, *Annals of Public and Cooperative Economics* 69:2, pp 175-192

MARCUELLO, C.(coord) (2016). Informe de la Economía Social en Aragón, 2015 Características, dimensión y evolución de la Economía Social aragonesa, Cátedra Cooperativas y Economía Social, Caja Rural de Teruel Universidad de Zaragoza, ISBN 978-84-944235-6-7

MARCUELLO, C.(coord) (2017). Informe de la Economía Social en Aragón, 2016 Características, dimensión y evolución de la Economía Social aragonesa. Cátedra Cooperativas y Economía Social, Caja Rural de Teruel Universidad de Zaragoza, ISBN 978-84-946082-5-4, 152 p

PEDREÑO FRUTOS, J.A. (2017): Reflexiones, sinergias y clarificación sobre nuevos conceptos y modelos: economía social, empresa social, emprendimiento social, economía del bien común, economía solidaria y economía colaborativa, *Revista Española del Tercer Sector*, 2017, nº 35, 45-72

Real Decreto 949/2015, de 23 de octubre, por el que se aprueba el Reglamento del Registro Nacional de Asociaciones. BOE-A-2015-11429

Registro General de Asociaciones de la Comunidad Autónoma de Aragón

RUIZ OLABUÉNAGA, J.I (2001): El sector no lucrativo en España, CIRIEC-España, *Revista de Economía Pública, Social y Cooperativa*, nº 37, pp 51-78

SAJARDO MORENO, A. (2004): Economía social y nuevo estado de bienestar. Los servicios asistenciales y la integración socio-laboral, *Mediterráneo económico* 6, Ed, Cajamar caja Rural Sociedad Cooperativa de Crédito (ISBN- 84-95531-24-0)

SAJARDO MORENO, A. Y CHAVES, R. (2006): Balance y tendencias en la investigación sobre Tercer Sector no lucrativo. Especial referencia al caso español, CIRIEC-España, *Revista de Economía Pública, Social y Cooperativa*, nº 56, pp 87-116

SALAMON, L. M., ANHEIER, H. K.(1992): In search of the non-profit sector. I: The question of definitions, *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, Volume 3, Issue 2, pp 125–152

SALAMON L. Y ANHEIER H. K. (1992): In search of the nonprofit sector II: The problem of classification, Working paper number 3, October, The Johns Hopkins University, Institute for Policy Studies, Baltimore, EE. UU

SALAMON, L. M., ANHEIER, H. K. AND ASSOCIATES (1994): The Emerging Sector Revisited A summary. Revised estimates, *The Johns Hopkins Comparative Nonprofit Sector Project*, Phase II. University, Institute for Policy Studies, Baltimore. ISBN: 1-886333-40-8

SALAMON, L. M. Y ANHEIER, H. K. (1996): The non profit Sector: A new Global Force, *Working papers of The Johns Hopkins Comparative Nonprofit Sector Project* nº 21, The Johns Hopkins University Institute for Policy Studies. ISBN: 1-886333-25-4

VALORACIÓN DE PROYECTOS DE INVERSIÓN A TRAVÉS DE OPCIONES REALES. APLICACIÓN AL CAPITAL RIESGO EN EL SECTOR TECNOLÓGICO

RAISA PÉREZ VAS

Facultad Ciencias Económicas y Empresariales/Departamento de Economía Financiera y Contabilidad/
Universidad de Vigo
Campus As Lagoas Marcosende 36310

MIGUEL ÁNGEL CRESPO CIBRÁN

Facultad Ciencias Económicas y Empresariales/Departamento de Economía Financiera y Contabilidad/
Universidad de Vigo
Campus As Lagoas Marcosende 36310

e-mail Raisa Pérez Vas: raiperez@uvigo.es

Resumen

Este artículo tiene como objetivo la valoración de proyectos de inversión relativos al sector del capital riesgo a través de la metodología de opciones reales. Tras las críticas que recibieron los modelos clásicos de valoración se empezó a focalizar la investigación en nuevos modelos que corrijan las deficiencias encontradas, lo que centró la investigación en las opciones reales. Los proyectos de inversión que son llevados a cabo por las empresas de capital riesgo cumplen una de las características necesarias en la aplicación de esta metodología: la existencia de una alta incertidumbre. En la aplicación práctica se va a valorar una inversión realizada por una empresa de capital riesgo en el sector de la tecnología a través del modelo de valoración Binomial con la finalidad de contrastar que modelo otorga una mejor valoración del proyecto, la vertiente clásica o la nueva metodología de opciones reales.

Palabras clave: opciones reales, capital riesgo, incertidumbre, tecnología, proyecto de inversión.

Eje Temático 7 : Economía y Empresa

Abstract

This paper aims at the valuation of investment project thought methodology real options in the venture capital. Because of criticism of classical models of valuation, research began to focus on new models of valuation that resolve the limitations found, thus the research focused on real options. The Investments projects carry out by venture capital companies meet one of the characteristics required in the application of this methodology: the existence

of high uncertainty. The goal of the application is value an investment made by venture capital company in technology sector though Binomial model in order to contrast that model provide a better valuation of the project.

Key Words: real options, venture capital, uncertainty, technology, investment project.

Thematic Area 7: Economics and Business.

1. INTRODUCCIÓN

Uno de los desafíos que presentan las empresas es realizar la correcta valoración de un proyecto de inversión. La dinámica actual de los negocios, caracterizada por elevadas incertidumbres, así como una necesidad de mayor flexibilidad en la toma de decisiones, propicia una mayor dificultad para su realización. Estas circunstancias, junta a las deficiencias que presentan los modelos tradicionales de valoración motivaron una creciente investigación en nuevos modelos de valoración de proyectos, específicamente, en el campo de las Opciones Reales.

Los modelos tradicionales de valoración de inversiones como son el Valor Actual Neto (VAN) o la Tasa Interna de Retorno (TIR) presentan importantes limitaciones que pueden afectar al valor del proyecto. Entre las más notables se encuentra que solo tiene en cuenta un escenario de actuación, es decir, no otorgan la flexibilidad de poder actuar y evaluar circunstancias que no fueron incluidas en el proyecto inicialmente (Rogers, 2002). Estos modelos tienen su base en los flujos de caja que generan las inversiones, por lo que, no están teniendo en cuenta aspectos estratégicos que pueden ser importantes para la empresa, es decir, no toman en consideración la posibilidad de las oportunidades futuras de poder modificar un proyecto, lo que se denomina como opciones administrativas (Ross y otros, 2010; Hayes y Garvin, 1982). En esta línea, Hu y Zhang (2015) sostiene que los modelos tradicionales utilizan una estrategia de gestión rígida, por lo que no están teniendo en cuenta la toma de decisiones que se pueden dar en el transcurso del proyecto de inversión, es decir, no se considera la flexibilidad.

La metodología de Opciones Reales es un procedimiento relativamente nuevo con el que se pretende solventar las limitaciones de los modelos clásicos de valoración. Los inicios de la metodología de las opciones reales tienen su base en el artículo publicado por Stewart Myers en 1977 donde se expone la posibilidad de utilizar los modelos de valoración de opciones financieras para valorar bienes no financieros. En esta línea, esta teoría ha dado a conocer otra técnica de evaluación de inversiones con elevada incertidumbre a través de las técnicas de las Opciones Financieras para la valoración de activos reales (Kester, 1984).

Como se expuso, la valoración de proyectos de inversión a través de Opciones Reales tuvo sus inicios para dar respuestas a las características del entorno económico actual que los modelos tradicionales no estaban teniendo en consideración. En el entorno descrito son frecuentes los cambios rápidos así con una gran incertidumbre, lo que provoca la necesidad de flexibilidad por parte de las empresas (Borison y Triantis, 2001). El nuevo enfoque de las opciones reales trata con mayor éxito estos desafíos, en gran medida, porque reconoce que las decisiones futuras a las que se presenta la empresa dependen de la obtención de nueva información que se va adquiriendo a través de la realización del proyecto de inversión (Borison y Triantis, 2001; Gouldby y otros, 2014). Por ello, las opciones reales son conocidas como un enfoque que mejora el valor de un proyecto sobre incertidumbre (Martínez y otros, 2013).

La investigación de opciones reales en el sector del capital riesgo no se encuentra muy desarrollada, si bien, como expone la Asociación española de capital, crecimiento e inversión (ASCRI) el Capital Riesgo suele ser utilizado en inversiones con un riesgo elevado, así como una incertidumbre inherente al

proyecto. En el presente estudio se va a analizar la valoración de un proyecto de inversión llevado a cabo por una empresa de capital riesgo en el sector tecnológico mediante la metodología de Opciones Reales.

El artículo está estructurado como de la siguiente forma. En el siguiente apartado se abarca el marco teórico relativo a las opciones reales. En el tercer apartado se detalla la estructura a seguir para realizar la valoración de proyectos de inversión a través del Modelo Binomial relativo a las opciones reales. Posteriormente, en la sección 4 se expone el caso a estudio y los resultados obtenidos. Por último, se presentan las conclusiones.

2. MARCO TEÓRICO

La teoría de Opciones Reales tiene su origen en las opciones financieras. Las Opciones reales se definen como el derecho sobre un activo real, es decir, con respecto a un proyecto de inversión la posibilidad de expandir, esperar o abandonar una determinada decisión de inversión (Myers, 1977). Diversos autores han realizado clasificaciones de los tipos de opciones reales existentes. Entre otros, Wörsdörfer y otros (2017) distinguen entre las opciones presentes al inicio del proyecto de inversión o las que se dan para realizar ajustes en el proyecto una vez iniciado. Al inicio del proyecto, existe la opción de esperar o aplazar y los posibles ajustes que se pueden realizar son, por ejemplo, expandir o reducir el proyecto, abandonarlo o cambiar el modo de realización.

Una de las aportaciones más importantes que ha supuesto el enfoque de las opciones reales a la valoración de proyectos de inversión radica en que combina la incertidumbre con la flexibilidad de gestión. A través de lo expuesto, la empresa puede adaptarse para poder disminuir posibles situaciones de riesgo o para reducir o no incurrir en pérdidas, aunque teniendo presente que se pueden captar oportunidades que generen un mayor beneficio (Hu y Zhang, 2015).

En la línea anterior, Nelson y otros (2013) exponen que el enfoque de las opciones reales sirve para superar las limitaciones que presentan los modelos de valoración basados en el flujo de caja descontado, esto lo consigue puesto que valora la flexibilidad que es necesaria para adaptar las estrategias de inversión a medida que la empresa obtiene más información, lo que facilita la resolución de la incertidumbre. Es por ello, que la adopción de la flexibilidad sirve para la adaptación de la estrategia empresarial a medida que se obtiene una mayor información.

Según muestra Culík (2016), frente a la valoración pasiva que se obtiene a través de los modelos de valoración tradicionales, el enfoque de las opciones reales tiene en cuenta dos factores fundamentales en la valoración: el riesgo que supone la posible variabilidad de los flujos de caja esperados proporcionados por el activo y la flexibilidad que proporciona a la empresa la posibilidad de cambiar decisiones en torno al proyecto. Como se expuso, la metodología de las opciones reales tiene su base en la teoría de las opciones financieras, por lo que, el autor muestra que para que sea de aplicación deben darse las siguientes circunstancias: exista riesgo; el riesgo impulse el valor del proyecto; los gestores tengan flexibilidad; las estrategias de flexibilidad (opciones reales) sean creíbles y ejecutables; la gestión sea racional en la ejecución de las opciones reales.

2.1. MODELO DE VALORACIÓN

La metodología de valoración de proyectos de inversión a través de opciones reales tiene su base en los modelos de valoración de las opciones financieras. Los modelos más importantes relativos a la valoración de opciones financieras son el Modelo de Black-Scholes, Modelo Binomial propuesto por Cox y otros (1979) y la simulación de Montecarlo.

Entre los modelos expuestos, el Modelo Binomial a través de la herramienta de árboles de decisión es uno de los modelos más utilizados entre los investigadores para la valoración de proyectos de inversión, debido a su gran versatilidad y adaptación a los activos reales (Lamothe y Méndez, 2013). En esta línea, Amram y Kulatilaka (2000) sostienen que el Modelo Binomial de valoración de opciones presenta tres ventajas importantes en la aplicación para opciones reales: 1) es un modelo que puede ser aplicable a las opciones reales, incluso en opciones reales con cierta complejidad; 2) aunque está basado en la valoración de opciones financieras mantiene la apariencia del análisis del flujo de caja descontado; 3) se realiza una buena descripción de la incertidumbre y de las decisiones contingentes.

Entre algunas de las aplicaciones realizadas se encuentran Brandão y otros (2005); Ferreira y otros (2014); González y otros (2016); Zhang y otros (2014); Culík (2016); Hernandez y otros (2017); Nunes y otros (2017); Wörsdörfer y otros (2017); Loncar y otros (2017).

Una de las características de los árboles de decisión es que la empresa puede tener en consideración posibles decisiones futuras que afecten al proyecto de inversión. Por ello, esta herramienta permite reevaluar las decisiones de inversión que pueden incidir en el proyecto una vez está iniciado. La reconsideración de la evaluación de un proyecto puede venir provocada por la recepción de nueva información relevante en el horizonte temporal en el que se desarrolla, lo que provoca una modificación en el curso del proyecto. Esta modificación es llevada a cabo mediante la flexibilidad que incorpora el modelo de opciones reales.

La metodología de valoración a través de Opciones Reales incorporó al análisis financiero tradicional una nueva perspectiva, donde las opciones reales se presentan no como una alternativa para la valoración de proyectos, sino como un complemento a las herramientas tradicionales de valoración de proyectos, aportando flexibilidad y factores estratégicos a la empresa. Copeland y Antikarov (2003) manifiestan que tanto el VAN como el enfoque de opciones reales consideran todos los flujos de efectivo a lo largo de la vida de un proyecto a través de su valor presente, usando ambos métodos el coste de oportunidad de mercado. Es por ello, que sostienen que el VAN es un enfoque de opciones reales que no supone la flexibilidad en la toma de decisiones. En el enfoque de opciones reales se agrega un valor al VAN, es decir, se tiene en cuenta el valor de la opción que recoge el valor de mantener la flexibilidad de gestión (Mayer y otros, 2017). Por todo ello, en este ámbito, diversos autores exponen que la valoración de un proyecto de inversión viene definida por el VAN más el valor de las opciones reales, lo que denominan VAN estratégico expandido (Trigeorgis, 1996) o VAN expandido (Hu y Zhang, 2015; Weibel y Madlener, 2015; Culík, 2016; Hernandez y otros, 2017). Analíticamente:

VAN expandido = VAN estático + Valor de las opciones reales

Como se puede apreciar la metodología de las opciones reales está estrechamente ligada con el VAN, ya que el valor total de un proyecto de inversión a través de las opciones reales es definido a través de la valoración tradicional del VAN, en la que se tienen en cuenta los flujos de caja esperados por la realización de una inversión, más la parte estratégica que es proporcionada por la incorporación de la flexibilidad. En esta misma línea, como tratan Mayer y otros (2017) el modelo de opciones reales agrega al valor del VAN el valor de la opción, la cual recoge el valor de la flexibilidad, proporcionando, por lo tanto, la posibilidad de una administración activa (Culík, 2016). Al estar añadiendo al VAN el valor de la opción estratégica que incorpora flexibilidad e incertidumbre, el valor total del proyecto de inversión (VAN expandido) se está viendo incrementado, de manera que la metodología de opciones reales provoca un aumento del valor de un proyecto (Hernandez y otros, 2017).

En la misma línea, Dias (2004) sugiere que el enfoque de las opciones reales puede ser visto como una optimización de un problema bajo incertidumbre, por lo que es necesario maximizar el VAN sujeto a: las opciones relevantes (flexibilidad); incertidumbres de mercado; incertidumbres técnicas.

3. METODOLOGÍA: VALORACIÓN DE OPCIONES REALES

Para la aplicación del Modelo Binomial a la valoración de proyectos de inversión es necesario definir, entre otras, las siguientes variables:

VP: valor actual de los flujos de caja esperados (activo subyacente).

σ = volatilidad.

T = duración de la vida de la opción.

n = número de periodos que presente el árbol binomial.

u = factor de subida del valor del activo subyacente.

d = factor de bajada del valor del activo subyacente.

p_u = probabilidad neutral al riesgo de ascenso del valor del activo subyacente.

p_d = probabilidad neutral al riesgo de descenso del valor del activo subyacente.

Donde,

$$dt = T/n \tag{1}$$

$$u = e^{\sigma\sqrt{dt}} \tag{2}$$

$$d = e^{-\sigma\sqrt{dt}} = \frac{1}{u} \tag{3}$$

$$p_u = \frac{e^{r_f \frac{T}{n}} - d}{u - d} \quad (4)$$

$$p_d = 1 - p_u \quad (5)$$

El procedimiento para aplicar la metodología de opciones reales a través del modelo Binomial a un proyecto de inversión es desarrollado a través de las siguientes etapas:

1) Estimación de los factores que afectan a la evolución de los flujos de caja.

En esta etapa se realizarán las estimaciones de las variables que inciden en el cálculo del valor actual neto (VAN) (ingresos, costes de producción, gastos de personal...).

2) Estimación del proyecto de inversión sin flexibilidad

Se realizará la estimación del valor del proyecto de inversión sin tener en cuenta la flexibilidad, es decir, se calculará el VAN.

3) Creación del árbol binomial correspondiente al activo subyacente sin flexibilidad.

Creación del proceso de difusión del valor del activo subyacente. Esta fase implica la creación de un árbol binomial que muestre el valor actual de los flujos de caja esperados (VAN), así como sus respectivos movimientos de subida y de bajada.

Tabla 1. Árbol binomial VAN

$VP_{0,0}$	$VP_{1,1} = VPu$	$VP_{2,2} = VPu^2$	$VP_{3,3} = VPu^3$		$VP_{n,n} = VPu^n$
	$VP_{0,1} = VPd$	$VP_{1,2} = VPud$	$VP_{2,3} = VPu^2d$		$VP_{n-1,n} = VPu^{n-1}d$
		$VP_{0,2} = VPd^2$	$VP_{1,3} = VPud^2$...	$VP_{n-2,n} = VPu^{n-2}d^2$
			$VP_{0,3} = VPd^3$		$VP_{n-3,n} = VPu^{n-3}d^3$
					⋮
					$VP_{2,n} = VPu^2d^{n-2}$
					$VP_{1,n} = VPud^{n-1}$
					$VP_{0,n} = VPd^n$

Genéricamente:

$$VP_{i,j} = u^i d^{|i-j|} VP_{0,0} \quad ($$

SEQ Ecuación ARABIC6)

4) Estimación del proyecto de inversión con flexibilidad

La estructura esencial que representa el valor de un proyecto de inversión con la incorporación de las opciones es semejante a la realizada anteriormente, pero, en

este caso se incorpora el valor de la flexibilidad.

Tabla 2. Árbol binomial del valor del proyecto con flexibilidad

ROV	$ROV_{1,1}$	$ROV_{2,2}$	$ROV_{3,3}$	$ROV_{4,4}$		$ROV_{n,n}$
	$ROV_{0,1}$	$ROV_{1,2}$	$ROV_{2,3}$	$ROV_{3,4}$		$ROV_{n-1,n}$
		$ROV_{0,2}$	$ROV_{1,3}$	$ROV_{2,4}$	$ROV_{n-2,n}$
			$ROV_{0,3}$	$ROV_{1,4}$		$ROV_{n-3,n}$
				$ROV_{0,4}$		$ROV_{n-4,n}$
						⋮
						$ROV_{0,n}$

Dependiendo del tipo de opción que se esté valorando (expansión, abandono, diferimiento...) la expresión matemática que permite el cálculo de ROV se realizará de una manera diferente para cada tipo de opción. Sin embargo, el proceso que es necesario realizar para la consecución de la creación de la estructura que conforma el valor del proyecto de inversión con la incorporación de opciones es el mismo para todos los casos, constando de dos pasos. En primer lugar, se calculará el valor de los nodos terminales y, en segundo lugar, se calculará el valor de los nodos intermedios a través del proceso denominado inducción hacia atrás o inducción regresiva. La valoración de los nodos se realizará a través de una regla de maximización en la que se compara el valor del proyecto sin opciones y el valor del proyecto con la incursión de las opciones que se estén tratando.

5) Elección de la decisión óptima.

Una vez analizado la valoración del proyecto la empresa analizará la mejor decisión en torno a la valoración que se realizó.

4. CASO A ESTUDIO

4.1. CAPITAL RIESGO

El capital riesgo es una actividad financiera orientada a la prestación de financiación a empresas que se encuentran en fase de desarrollo. Normalmente, esta financiación está orientada a empresas que tienen dificultades de obtenerla a través de otros medios (Meglio et al., 2017), generalmente empresas pequeñas y jóvenes expuestas a altos niveles de incertidumbre (Gompers y Lerner, 2001). En esta línea, Shalman (1990) expone que las empresas de capital riesgo tuvieron una buena adaptación a entornos caracterizados por incertidumbre y asimetrías de información. Más recientemente, Tong y Li (2011) exponen que el capital riesgo se

está convirtiendo en un importante medio para que las empresas logren un crecimiento y expansión estratégicos.

Las empresas de capital riesgo, además de otorgar financiación a las empresas, ofrecen un servicio de asesoría para evaluar las inversiones, obtención de nuevas ideas, posibles nuevos inversores, equipos profesionales de dirección de proyectos etc.

La forma de financiación que confiere la empresa de capital riesgo a la empresa receptora suele ser escalonada, es decir, por etapas. Esto se realiza según los resultados que la empresa vaya consiguiendo, por lo que, puede ser visto como una opción real compuesta. Esto permite a los inversores abandonar la inversión en caso que la información intermedia sea negativa (Ewens y otros, 2018).

4.2. DESCRIPCIÓN DEL PROYECTO

En la aplicación práctica se va a realizar la valoración de un proyecto de inversión llevado a cabo por una empresa de capital riesgo mediante el modelo propuesto de opciones reales. Para ello, se está colaborando con una empresa de capital riesgo que es la encargada de ceder proyectos de inversión de varios sectores para su análisis. En este caso, se va a abordar la valoración de un proyecto de inversión llevado a cabo en el sector tecnológico.

El sector tecnológico se caracteriza por un fuerte dinamismo en el I+D, por lo que, las inversiones a realizar presentan niveles de riesgo elevados, lo que conduce a la inclusión de opciones de espera, abandono o expansión (Liu y otros, 2019). En este sector, en el que el papel del I+D es un factor fundamental, la toma de decisiones en relación a la realización de inversiones juega un rol fundamental. En el caso a estudio, la empresa tecnológica desea desarrollar y comercializar nuevos equipos de búsqueda, por lo que su objetivo en un periodo de siete años es la expansión de la empresa tanto a nivel nacional como internacional. Para llevar a cabo la expansión necesita fuentes de financiación, siendo una parte de esa financiación proporcionada por la empresa de capital riesgo a cambio de una plusvalía en el momento de vencimiento de la deuda.

En la metodología de opciones reales este tipo de proyecto es tratado como una opción de expansión o crecimiento, por lo que, para su estimación es necesario definir un factor de expansión (E) y el coste de realizar la expansión (C).

Como se expuso anteriormente los valores correspondientes a ROV vienen definidos según el tipo de opción que estemos valorando. Para este caso, al tratarse de una opción de expansión la formulación que se llevará a cabo es la siguiente:

1) Valoración de los nodos finales. Se aplica una regla de maximización, que compara el valor del proyecto sin realizar la expansión contra la realización de la expansión. Por lo tanto:

$$ROV_{i,j} = \text{Max} \left(VP_{i,j}; VP_{i,j}E - C \right) \quad (6)$$

2) El siguiente paso es realizar la valoración de los nodos precedentes hasta llegar al momento inicial en el que se realiza la valoración. Como en el paso anterior se vuelve a aplicar una regla de maximización teniendo en cuenta las probabilidades de subida y bajada del valor del proyecto además de tener que actualizar dicho

valor a la tasa libre de riesgo, así como del valor del proyecto si se efectuase en ese periodo la expansión. Análíticamente:

$$ROV_{i,j} = \text{Max} \left(VP_{i,j} E - C; p_u ROV_{i+1;j+1} + p_d ROV_{i,j+1} \right) (1+r_f)^{-dt} \quad (7)$$

4.3 DATOS

Para la realización de los árboles binomiales, tanto del VAN como del valor del proyecto teniendo en cuenta la opción de expansión, es necesario previamente el cálculo de una serie de parámetros recogidos en la tabla 3.

Tabla 3. Valor de las variables para la construcción del árbol binomial

Variable	Valor
(1) Valor del activo subyacente (VAN)	153.745'26
(2) Volatilidad (σ)	7'61%
(3) Duración del proyecto (T)	7 años
(4) Duración de cada etapa (n)	1
(5) u	1'07
(6) d	0'92
(7) p_u	0'5877
(8) p_d	0'4123
(9) Tasa libre de riesgo r_f	1'61%

(1) Valor del activo subyacente (VAN): corresponde con la estimación realizada por el modelo de descuento de flujos de caja VAN.

(2) Volatilidad (σ): es la desviación típica de los flujos de caja calculados para la obtención del VAN. Su cálculo ha sido realizado a través de la siguiente fórmula:

$$\sigma = \ln \left(\frac{\sum_{i=1}^n PV_i}{\sum_{i=0}^n PV_i} \right) \quad (8)$$

(3) Duración del proyecto (T): corresponde con el periodo de tiempo que se va a desarrollar el proyecto.

(4) Duración de cada etapa (n): corresponde con la duración que se desarrolla cada etapa, en este caso se toma un año debido a que es el periodo de tiempo que se realizan las estimaciones de los flujos de caja.

(5) u : representa el movimiento de subida del valor del activo subyacente (VAN) que viene definido por la ecuación (2).

(6) d : representa el movimiento de bajada del valor del activo subyacente (VAN) que viene definido por la ecuación (3).

(7) p_u : probabilidad neutral al riesgo de ascenso del valor del activo subyacente que viene definida por la ecuación (4).

(8) p_d : probabilidad neutral al riesgo de descenso del valor del activo subyacente que viene definido por la ecuación (5).

(9) r_f : es la tasa de descuento libre de riesgo. Para su estimación se tomó de referencia el tipo de interés de una obligación del Estado a 10 años.

4.4 RESULTADOS

Una vez definidos los parámetros recogidos en la Tabla 3 se construye el árbol binomial del VAN (Tabla 4), siguiendo la estructura definida en la Tabla 1. El siguiente paso ha sido la creación del árbol binomial relativo al valor del proyecto con la opción de expansión (Tabla 5) atendiendo a la Tabla 2 y a las ecuaciones (8) y (9).

Tabla 4. Evolución del valor del activo subyacente (VAN)

PERIODO	0	1	2	3	4	5	6	7
								261.969,69
						224.969,00	242.765,44	224.969,00
				208.477,16	193.194,30	208.477,16	193.194,30	193.194,30
		179.031,78	193.194,30	179.031,78	193.194,30	179.031,78	179.031,78	193.194,30
	165.907,47	153.745,26	165.907,47	153.745,26	165.907,47	153.745,26	153.745,26	165.907,47
153.745,26	142.474,64	132.030,23	142.474,64	132.030,23	142.474,64	132.030,23	142.474,64	142.474,64
			122.351,47	132.030,23	122.351,47	132.030,23	122.351,47	122.351,47
				113.382,23	122.351,47	113.382,23	113.382,23	122.351,47
					105.070,50	113.382,23	105.070,50	105.070,50
						97.368,09	105.070,50	105.070,50
							97.368,09	97.368,09
								90.230,31

Tabla 5. Evolución del valor del proyecto con opción de expansión

PERIODO	0	1	2	3	4	5	6	7
							2.851.529,33	2.912.781,19
					2.792.348,66		2.817.236,64	2.875.780,50
			2.679.755,36		2.760.565,78		2.787.787,46	2.844.005,80
		2.626.138,62		2.705.669,11			2.762.497,70	2.816.718,97
	2.574.183,80		2.652.454,47		2.733.271,92		2.740.779,87	2.793.286,14
2.523.805,18		2.600.835,83		2.680.372,84			2.722.129,47	2.773.162,97
	2.550.732,87		2.629.009,58		2.709.833,06		2.706.113,26	2.755.882,00
		2.579.106,82		2.658.649,42			2.672.419,30	2.741.041,81
			2.608.876,05		2.689.704,71			
				2.639.994,22				
					2.672.419,30			
						2.706.113,26		
							2.741.041,81	

En la evolución del VAN (Tabla 4) se aprecia que la empresa parte de un valor estimado inicial del VAN en el momento 0 de 153.745'26 euros. Para el desarrollo el árbol binomial se aplican los factores de subida (u) y bajada (d), obteniendo un valor máximo del valor de la empresa de 261.989'69 euros y un valor mínimo de 90.230'31 euros en el séptimo periodo. Ante este escenario, la empresa está generando valor, si bien no se está considerando oportunidades futuras de inversión, por lo que, la flexibilidad de gestión no está siendo valorada. Para solventar esta circunstancia, se lleva a cabo la valoración del proyecto con la posibilidad de una opción de expansión cuyos resultados se muestran en la Tabla 5. Para el cálculo del valor de los nodos del periodo 7 se aplica la fórmula (7), en la que se usa una regla de maximización entre el valor del proyecto sin flexibilidad (VAN) y el valor del proyecto teniendo en cuenta una opción de expansión. En los nodos precedentes, correspondientes al periodo 0-6, se emplea la fórmula (8). Una vez desarrollado se obtiene que el valor del proyecto teniendo en cuenta la flexibilidad de gestión, es decir, teniendo en cuenta las oportunidades de expansión que la empresa desea desarrollar en los años futuros, ascendiendo el valor del proyecto a 2.523.805'18 euros.

5. CONCLUSIONES

Este artículo presenta una valoración a través de la metodología de opciones reales de un proyecto de inversión llevado a cabo por una empresa de capital riesgo en el sector tecnológico.

En el desarrollo de los árboles binomiales se muestra que el llevar a cabo una opción de expansión secuenciada el valor del proyecto se ve altamente elevado, circunstancia descrita por la inclusión de la flexibilidad de gestión al proyecto. Por ello, es de interés la aplicación de opciones reales debido a que mejora la toma de decisiones relacionadas con la parte estratégica que desea realizar la empresa.

A pesar de las ventajas que presenta la valoración a través de opciones reales es necesario resaltar las limitaciones que conlleva. Por un lado, en el cálculo del VAN se utilizan estimaciones realizadas sobre las variables que confieren los flujos de caja, dotando esta valoración en ocasiones de cierta subjetividad. Además, la

identificación de opciones reales por parte de la gerencia envuelve un grado también de subjetividad, lo que puede conducir a impulsar proyectos de inversión con opciones que no hay la suficiente certeza que se vayan a producir, acarreado una sobrevaloración del proyecto.

En futuras líneas de investigación se abre una vertiente de aplicación del modelo Binomial de opciones reales a proyectos de inversión desarrollados por empresas de capital riesgo. En esta ocasión se aplicó el modelo a un proyecto del sector tecnológico, si bien, además de poder contrastar su utilidad en más proyectos de este sector, se podría analizar su utilidad y posibles diferencias en proyectos de inversión llevados a cabo por empresas del capital riesgo en otros sectores. Además, también se plantea una futura investigación en la valoración de proyectos teniendo en cuenta, además de una opción (en este caso de expansión), la inclusión de diversos tipos de opción, como pueden ser opciones de espera o reemplazo, entre otros.

REFERENCIAS

- AMRAM, M.; KULATILAKA, N. (2000): *Opciones Reales: Evaluación de inversiones en un mundo incierto*. Gestión 2000, Barcelona.
- BORISON, A.; TRIANTIS, A. (2001): Real Options: State of the Practice. *Journal of Applied Corporate Finance*, 14 (2), 8-24.
- BRANDÃO, L.E.; DYER, J.S.; HAHN, W.J. (2005): Using Binomial Decision Trees to Solve Real-Option Valuation Problems. *Decision Analysis*, 2 (2), 69-88.
- COPELAND, T.; ANTIKAROV, V. (2003): *Real options: a practitioner's guide*. Thomson, New York.
- COX, J.; ROSS, S.; RUBINSTEIN, M. (1979): Option pricing: a simplified approach. *Journal of Financial Economics*, 7, 229-263.
- CULÍK, M. (2016): Real options valuation with changing volatility. *Perspectives in Science*, 7, 10-18.
- DIAS, M. A. (2004): Valuation of exploration and production assets: an overview of real options models. *Journal of Petroleum Science and Engineering*, 44, 93-114.
- EWENS, M.; NANDA, R.; RHODES-KROPF, M. (2018): Cost of experimentation and the evolution of venture capital. *Journal of Financial Economics*, 128, 422-442.
- FERREIRA, P.; MENDES, C.; SANTOS, L.; SOARES, I. (2014): Real options versus Traditional Methods to asses Renewable Energy Projects. *Renewable Energy*, 68, 588-594.
- GOMPERS, P., LERNER, J. (2001): The venture capital revolution. *Journal of Economic Perspectives*, 15 (2), 145-168.
- GONZÁLEZ, J.M.; MARTÍN, G.; ZAMORA, C. (2016): Application of real options valuation for analysing the impact of public R&D financing on renewable energy projects: A company 's perspective. *Renewable and Sustainable Energy reviews*, 63, 292-301.
- GOULDBY, B.; KAPELAN, Z.; WOODWARD, M. (2014): Adaptive flood risk management under climate change uncertainty using Real Options and optimization. *Risk Analysis*, 34 (1), 75-92.
- HAYES, R. H.; GARVIN, D. A. (1982): Managing as if Tomorrow Mattered. *Harvard Business Review*, 50 (3), 70-79.
- HERNANDEZ, E.A.; MUN, J.; ROCCO, C.M. (2017): Active management in state-owned energy companies: Integrating a real options approach into multicriteria analysis to make companies sustainable. *Applied Energy*, 195, 487-502.

- HU, Q.; ZHANG, A. (2015): Real option analysis of aircraft acquisition: A case study. *Journal of Air Transport Management*, 46, 19-29.
- KESTER, W.C. (1984): Today's Options for Tomorrow's Growth. *Harvard Business Review*, 62 (2), 153-160.
- LAMOTHE, P.; MÉNDEZ, M. (2013): *Opciones Reales: métodos de simulación y valoración*. Ecobook, Madrid.
- LIU, L.; MINGMING, Z.; ZHAO, Z. (2019): The Application of Real Option to Renewable Energy Investment: A Review. *Energy Procedia*, 158, 3494-3499.
- LONCAR, D.; MILOVANOVIC, I.; RAKIC, B.; RADJENOVIC, T. (2017): Compound real options valuation of renewable energy projects: The case of a wind farm in Serbia. *Renewable and Sustainable Energy Reviews*, 75, 354-367.
- MARTÍNEZ, E.A.; MUTALE, J.; RIVAS-DÁVALOS, F. (2013): Real options theory applied to electricity generation projects: A review. *Renewable and Sustainable Energy Reviews*, 19, 573-581.
- MAYER, C., BREUN, P., SCHULTMANN, F. (2017): Considering risks in early stage investment planning for emission abatement technologies in large combustion plants. *Journal of Cleaner Production*, 142, 133-144.
- MEGLIO, O., DESTRI, A.M. L., CAPASSO, A. (2017): Fostering Dynamic Growth in New Ventures through Venture Capital: Conceptualizing Venture Capital Capabilities. *Long Range Planning*, 50, 518-530.
- MYERS, S. (1977): Determinants of Corporate Borrowing. *Journal of Financial Economics*, 5 (2), 147-175.
- NELSON, R., HOWDEN, M. Y HAYMAN, P. (2013): Placing the power of real options analysis into the hands of natural resource managers - Taking the next step. *Journal of Environmental Management*, 124, 128-136.
- NUNES, M., OLIVEIRA, E., MELLO, V.E., ÁQUILA, G., SOUZA, L.C. Y ROTELA, P. (2017): Oil price volatility: A real option valuation approach in an African oil field. *Journal of Petroleum Science and Engineering*, 150, 297-304.
- ROGERS, J. (2002): *Strategy, Value and Risk – The Real Options Approach*. Palgrave Macmillan, New York.
- ROSS, S.; WESTERFIELD, R.; JORDAN, B. (2010): *Fundamentos de Finanzas Corporativas*. McGraw-Hill, México.
- SHALMAN, W.A. (1990): The structure and governance of venture-capital organizations. *Journal of Financial Economics*, 27, 473-521
- TONG, T.W., LI, Y. (2011): Real options and investment mode: evidence from corporate venture capital and acquisition. *Organization Science*, 22 (3), 659-674.
- TRIGEORGIS, L. (1996): *Real Options: Managerial Flexibility and Strategy in Resource Allocation*. MIT Press, Cambridge.
- WEIBEL, S.; MADLENER, R. (2015): Cost-effective design of ringwall storage hybrid power plants: A real options analysis. *Energy Conversion and Management*, 103, 871-885.
- WÖRSDÖRFER, D. LIER, S.; CRASSELT, N. (2017): Real options-based evaluation model for transformable plant designs in the process industry. *Journal of Manufacturing Systems*, 42, 29-43.
- ZHANG, M.; ZHOU, D.; ZHOU, P. (2014): A real option model for renewable energy policy evaluation with application to solar PV power generation in China. *Renewable and Sustainable Reviews*, 40, 944-955.

ANÁLISIS DEL COMPORTAMIENTO Y COMPETITIVIDAD DE LA PRODUCCIÓN Y COMERCIO DEL ARROZ PALAY EN MÉXICO

VERNA GRICEL PAT FERNÁNDEZ

PA-Universidad Autónoma Chapingo
Carretera México-Texcoco, km 38.5 Chapingo, México. C.P. 56230

IGNACIO CAAMAL CAUICH

DICEA-Universidad Autónoma Chapingo
Carretera México-Texcoco, km 38.5 Chapingo, México. C.P. 56230

e-mail Verna Gricel Pat Fernández: gricelpat@hotmail.com

Resumen

Las tasas de crecimiento y los índices de competitividad permiten la caracterización del comportamiento de las variables de producción y comercio y de la competitividad del arroz palay en México. El comportamiento de las variables de producción y comercio se mide con las tasas de crecimiento y la competitividad con los índices de competitividad. Los principales países productores de arroz son China Continental, India, Indonesia, Bangladesh y Vietnam. El objetivo del trabajo es realizar la caracterización de las tasas de crecimiento de las principales variables económicas de la producción y comercio y de los índices de competitividad del arroz palay de México. Las variables económicas estudiadas son superficie cosechada, rendimiento, producción, exportaciones e importaciones y los índices de competitividad calculados son índice de balanza comercial relativa, índice de transabilidad, coeficiente de especialización exportadora y coeficiente de exportación. La información se obtuvo de las bases estadísticas de la Organización de las Naciones Unidas para la Alimentación (FAOSTAT), del Departamento de Agricultura de los Estados Unidos (USDA), del Sistema de Información Agroalimentaria de Consulta (SIACON) y del Sistema de Información Arancelaria Vía Internet (SIAVI). Las tasas de crecimiento de la superficie cosechada y del volumen de producción de arroz palay en México han disminuido, mientras que la tasa de crecimiento de las importaciones se ha incrementado. Los índices de balanza comercial relativa y de transabilidad son negativos; los coeficientes de especialización exportadora y de exportación se encuentran en alrededor de cero; y el coeficiente de dependencia comercial es positivo, cercano a 0.8. Los resultados obtenidos reflejan que la producción de arroz en México ha venido decreciendo y no es competitivo en el mercado internacional.

Palabras clave: producción, exportación, importación, índices.

Abstract

Growth rates and competitive rates allow the characterization of the behavior of the production and trade variables and the competitiveness of palay rice in Mexico. The behavior of the production and trade variables is measured with the growth rates and competitiveness with the competitiveness indices. The main rice producing countries are Mainland China, India, Indonesia, Bangladesh and Viet Nam. The objective of the study is to make the characterization of the growth rates of the main economic variables of production and trade and the competitiveness indices of palay rice in Mexico. The economic variables studied are harvested area, yield, production, exports and imports and the indices of competitiveness calculated are index of relative trade balance, tradability index, coefficient of export specialization and export coefficient. The information was obtained from the statistical basis of the Food and Agriculture Organization of the United Nations (FAOSTAT), of the United States Department of Agriculture (USDA), of the Consultation Agro-Food Information System (SIACON) and the System of tariff information Via the Internet (SIAVI). The growth rates of the harvested area and production of palay rice in Mexico have declined, while the import growth rate has increased. The relative trade balance and tradability indices are negative; export specialization and export coefficients are found in around zero; and the trade dependency coefficient is positive, close to 0.8. The results obtained reflect that the production of rice in Mexico has been decreasing and is not competitive in the international market.

Key Words: production, export, import, index.

Eje Temático 1 : Economía Internacional

1. INTRODUCCIÓN

El arroz, *Oriza Sativa*, es una monocotiledónea, forma parte de la familia de las Poaceas. El origen del arroz se ubica en el continente de Asia hace 10 mil años y se expandió a China donde se desarrolló el cultivo. El cultivo de la planta del arroz se desarrolla a 50 grados de latitud Norte, hasta los 40 de latitud Sur y desde las zonas por debajo del nivel del mar hasta otras a más de 2.500 metros de altura (Swaminathan, 1984).

A nivel mundial, el arroz es el tercer cereal de mayor producción, después del maíz y el trigo (FAOSTAT, 2019). El arroz palay es uno de los cinco principales cereales de consumo humano en México, por su importancia económica es considerado un grano básico para la alimentación de la población, sin embargo, el cultivo del arroz tiene poca participación en la producción agrícola de México. La producción de arroz representa aproximadamente el 0.8% de la producción total de cereales en México (SIACON, 2019) y, a nivel mundial, México aporta el 0.03% de la producción total de arroz (FAOSTAT, 2019).

La expansión del cultivo del arroz en México fue durante la segunda mitad del siglo XIX. Sin embargo, el desarrollo del cultivo se incrementó a partir de la década de 1940 cuando se alcanzaron 70 mil hectáreas de superficie cosechada, posteriormente en la década de 1970 se llegó a las 165 mil hectáreas y en la década de 1980 pasó a 153 mil hectáreas, a partir de esta década se observa una tendencia negativa en la superficie cosechada (SIAP, 2010). Los requerimientos del mercado nacional e internacional desincentivan su producción, al punto de tener un déficit de abastecimiento de la demanda interna de más del setenta por ciento (SIACON, 2019).

A raíz de la caída de la producción, las importaciones de arroz palay en México se incrementaron a niveles alarmantes, esto representa la insuficiencia de abastecimiento de arroz palay que sufre México. Actualmente, se estima una dependencia comercial de arroz palay de 77%. La demanda de arroz palay en México, asciende a más de un millón 161 mil toneladas y la producción sólo es capaz de cubrir el 23% de la misma (SIACON, 2019). El principal abastecedor de arroz es Estados Unidos de América con cerca del 87% de la importaciones totales, seguido de Guyana con el 13% (SIACON, 2019).

La caída de la producción obedece a diferentes factores. En México la superficie sembrada de arroz ha disminuido y se ha optado por la siembra de maíz, o bien, productos de mayor rentabilidad aparentemente, principalmente en la región noroeste (Chávez, 2008).

1.1. PANORAMA MUNDIAL

A nivel mundial, la superficie cosechada de arroz ha presentado una tendencia creciente en el periodo de 1994 a 2017, al pasar de 147,252,079 a 167,249,103 hectáreas cosechadas, con una tasa de crecimiento de 13.6%. El país con la mayor superficie cosechada es la India, que representa el 26.2% de la superficie cosechada mundial, le siguen China continental con 18.4%, Indonesia con el 9.4%, Bangladesh con el 6.7% y Tailandia con el 6.3% (FAOSTAT, 2019).

En cuanto al rendimiento promedio mundial del arroz, su comportamiento ha presentado una tendencia creciente y constante en el periodo de 1994 a 2017,

pasando de 3.7 a 4.6 ton/ha, con una tasa de crecimiento de 25.8%. Dentro de los principales países productores de arroz, los que presentan los mayores rendimientos son China continental con 6.9 ton/ha, Viet Nam con 5.5 ton/ha e Indonesia con 5.2 ton/ha, sin embargo, hay países que presentan rendimientos más altos, entre los cuales se encuentran Australia con 9.8 ton/ha, Egipto con 9.3 ton/ha, Uruguay con 8.5 ton/ha, Estados Unidos de América con 8.4 ton/ha y Turquía con 8.2 ton/ha (FAOSTAT, 2019).

La producción de arroz ha tenido una tendencia creciente en el periodo de 1994 a 2017, al pasar de 538,591,048 a 769,657,791 toneladas, con una tasa de crecimiento de 42.9%. El principal país productor de arroz fue China continental con 212,676,000 toneladas, seguido por la India con 168,500,000 toneladas, Indonesia con 81,382,000 toneladas, Bangladesh con 48,980,000 toneladas y Viet Nam con 42,763,682 toneladas, destacando China que aportó alrededor del 28% de la producción mundial (FAOSTAT, 2019).

Las exportaciones de arroz han mostrado una tendencia creciente durante el periodo de 1994 a 2016, al pasar de 17,839,417 a 40,266,459 toneladas exportadas, con una tasa de crecimiento de 125.7%. Respecto al precio medio de las exportaciones, también se observa una tendencia creciente, fluctuando entre 244 y 673 dólares por tonelada. Por otro lado, las importaciones de arroz se incrementaron en 141.8%, al pasar de 15,809,750 a 38,224,624 toneladas importadas, mostrando una tendencia creciente con algunos altibajos. El precio de importación tuvo un incremento de 45.3%, al pasar de 351 a 509 dólares por tonelada (FAOSTAT, 2019), lo anterior refleja que la demanda de arroz a nivel mundial ha ido en aumento.

En el 2016, los principales países exportadores de arroz fueron Tailandia (24.5%), India (24.5%), Viet Nam (12.9%), Pakistán (9.8%) y Estados Unidos de América (8.2%), mientras que los principales países importadores fueron China Continental (9.2%), Benín (3.8%), Costa de Marfil (3.4%), Indonesia (3.4%) y Arabia Saudita (3.2 %), (FAOSTAT, 2019).

El objetivo del trabajo es realizar la caracterización de las tasas de crecimiento de las principales variables económicas de la producción y comercio y de los índices de competitividad del arroz palay de México.

2. MARCO TEÓRICO

2.1. VENTAJAS ABSOLUTA Y COMPARATIVA

El comercio exterior o internacional es la actividad económica basada en los intercambios de bienes, capitales y servicios que lleva a cabo un determinado país con el resto de los países del mundo, regulado por normas internacionales o acuerdos bilaterales (Ballesteros, 2005). El comercio internacional se aborda desde diferentes enfoques, entre los cuales destacan la teoría clásica y la teoría neoclásica del comercio internacional.

De acuerdo con la teoría clásica del comercio internacional, un país puede ser más eficiente que otro en la producción de algunos bienes y menos eficiente que otro en la producción de otros bienes. Independientemente de la causa de la diferencia en la eficiencia, ambos países se pueden beneficiar si cada uno se especializa en la producción de aquellos bienes que puede hacer más

eficientemente que el otro. Por ejemplo, los Estados Unidos de América son más eficientes que Brasil en la producción de computadores, en tanto que Brasil es más eficiente que los Estados Unidos de América en la producción de café. Estados Unidos de América debería especializarse, por tanto, en la producción de computadores y Brasil en la de café. Los Estados Unidos de América pueden exportar entonces a Brasil el excedente de producción de computadores, a cambio del excedente brasileño en la producción de café. Este patrón de especialización e intercambio internacional (o división internacional del trabajo) es eficiente y conduce a una mayor producción, tanto de computadores como de café. Principio en el cual se basa la teoría clásica del comercio internacional de Adam Smith (Chacholiades, 1992).

Con la teoría clásica, los países deben aprovechar sus recursos naturales y especializarse en la producción de artículos que gocen de ventajas absolutas. Estas naciones deben exportar esos artículos a fin de poder importar de otras naciones bienes producidos en mejores condiciones y a menores costos que en su territorio, estableciendo así, una división internacional del trabajo, benéfica para todos los países debido a que tendría como resultado un ingreso medio más elevado y mejor distribuido entre todas las naciones (Mercado, 1989).

La teoría clásica del comercio internacional también postula que éste se explica a través de la ventaja comparativa, desarrollada por David Ricardo. Cada nación producirá aquellos bienes en los que goce de una ventaja relativa y mediante el intercambio los distintos países se complementarán, sacarán provecho de sus diferencias. De este modo las diferencias de recursos, capacidades de la fuerza laboral y características del factor capital de los distintos países determinarán los patrones del comercio internacional (Steimberg, 2004).

El planteamiento de los neoclásicos establece como fundamento del comercio internacional a la diferente dotación de factores productivos en cada país, lo cual determina que los países tengan diferentes costos de producción. Los neoclásicos plantean que cada país debe especializarse en la producción de bienes intensivos en el factor más abundante, debido a que eso le proporcionará costos más bajos, así mismo, se debe exportar ese bien e importar el bien que no se produce (Chacholiades, 1992).

Las economías exportadoras son las que fabrican productos, con materias primas propias o importadas y luego los exportan, vendiéndolos en los mercados internacionales (Mercado, 1989). Por otro lado, la exportación se refiere al envío legal de mercancías nacionales o nacionalizadas para su uso o consumo en el extranjero, mientras que la importación se refiere al ingreso legal de mercancías de otros países para su distribución y consumo doméstico (BANCOMEXT, 2007).

El comercio impulsa el crecimiento mundial y de los países, lo que favorece a todos los participantes. Los consumidores disponen de más variedad de productos y la competencia entre los productos locales e importados hace que bajen los precios y aumente la calidad. La liberalización del comercio permite que los productores más eficientes compitan en condiciones de equidad con sus homólogos de otros países (Sardo, 2011).

De los elementos anteriores se desprende que a la mayoría de países les resulta favorable el comercio internacional, siendo éste una fuente de ingresos, y de este modo dichos países intentan mejorar la producción, calidad y comercialización de

aquellos productos que les es más fácil producir, aprovechando las ventajas comparativas de su territorio, por ejemplo: condiciones climáticas, geografía, disposición de mano de obra, personal capacitado, entre otros. De este modo cada país produce lo que mejor hace o lo que menos costos le implican producirlo.

2.2. COMPETITIVIDAD

A lo largo del tiempo se han desarrollado o surgido muchos conceptos acerca de la competitividad, que intentan explicar el significado y como funciona en el mercado mundial, he aquí algunas de ellas.

Según Lerma (2000) la competitividad en términos comerciales significa la posibilidad de triunfar sobre otros oferentes cuando, al confrontarse con los productos sustitutos, se tiene alta posibilidad de salir victorioso, favorecidos por la compra del consumidor. La competitividad en el ámbito del comercio exterior depende de condiciones que están presentes en los siguientes dos niveles:

1. Macro y estructural. Que comprende las condiciones básicas y generales del país o región necesarios para que las empresas puedan operar con eficiencia.
2. Micro y estructural. En el que se encuentran las condiciones a nivel empresa y producto que puede hacer que la mercancía se desplace exitosamente en los mercados meta.

El Instituto Mexicano para la Competitividad (2017) define a la competitividad como una forma de medir la economía en relación a los demás, es como una carrera donde importa que tan bien le vaya a uno respecto a los otros, en otras palabras, la competitividad es la capacidad para atraer y retener talento e inversión.

La Comisión Económica para América Latina y el Caribe (CEPAL), citado por Gutiérrez (2016), considera que la competitividad autentica debe estar basada en la incorporación de tecnología y el uso renovable de los recursos naturales, concepción que contrasta con la competitividad espuria que se basa en la explotación de los recursos humanos y naturales.

Para la organización de Cooperación para el Desarrollo Económico (OCDE), la competitividad se define como el grado en que un país es capaz de producir, bajo condiciones de libre mercado, bienes y servicios acorde a las necesidades de los mercados internacionales, manteniendo o incrementando, paralelamente, los ingresos reales de la población en el largo plazo (OCDE, 1992).

2.3. DETERMINANTES DE LA COMPETITIVIDAD

De acuerdo con Porter (1991), citado por Hernández (2008), una nación alcanza el éxito en un sector basada en 4 atributos genéricos:

1. Condiciones de los factores. Son la dotación de factores con los que cuenta un país.
2. Condiciones de la demanda. Significa la naturaleza de la demanda interior de los productos o servicios del sector. Según el autor hay cuatro características para que la composición de la demanda interior obtenga ventaja competitiva nacional:
 - a) Estructura segmentada de la demanda o distribución de la demanda para unas variedades en particular.
 - b) Compradores entendidos y exigentes. Es un mecanismo que permite observar las necesidades de los clientes más avanzados.

- c) Necesidades precursoras de los compradores.
- d) El tamaño del mercado interior.

3. Sectores afines y de apoyo. Hace alusión a la existencia o ausencia de sectores proveedores y sectores afines dentro del país, los cuales de ser competitivos generan apoyos especiales a las empresas que exportan mercancías o servicios.

4. Estrategia, estructura y rivalidad de las empresas. Hace alusión a las condiciones vigentes respecto a la forma en que se crean, organizan y gestionan las empresas.

2.4. ÍNDICES DE COMPETITIVIDAD

Los índices de competitividad son valores que miden el desempeño económico de una nación, reflejando las variables que permiten determinar el desempeño competitivo en cuanto a precios de un país con otros, ya sea de bienes o servicios (Murillo, 2005).

2.5. VARIABLES DE PRODUCCIÓN

Entre las variables de producción (SIAP, 2008) que se analizaron se encuentran:

Superficie sembrada. La superficie sembrada es la superficie agrícola en la cual se deposita la semilla de cualquier cultivo.

Superficie cosechada. La superficie cosechada es la superficie de la cual se obtuvo producción, esta variable se genera a partir de que inicia la recolección.

Rendimiento. El rendimiento es el resultado de la división de la producción obtenida entre la superficie cosechada.

Producción. La producción es el volumen de producción que se logró levantar en determinada superficie cosechada.

Precio medio rural. El precio medio rural se define como el precio pagado al productor en la venta de primera mano.

Valor de la producción. Es el valor total de la producción obtenida a nivel nacional.

3. METODOLOGÍA

3.1. FUENTES DE INFORMACIÓN Y VARIABLES

La información utilizada se obtuvo de bases de datos estadísticos de la Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAOSTAT), del Departamento de Agricultura de los Estados Unidos de América (USDA), del Sistema de Información Arancelaria Vía Internet (SIAVI), del Sistema de Información Agroalimentaria de Consulta (SIACON), del Sistema de Información Agroalimentaria y Pesquera (SIAP) y del Sistema de Información Arancelaria Vía Internet (SIAVI) de México. La información obtenida fue de las variables de producción y comercio (superficie cosechada, rendimiento, producción, valor de la producción, exportaciones, importaciones y balanza comercial). Se calcularon las tasas de crecimiento y los indicadores de competitividad del comercio del arroz palay de México.

3.2. TASA DE CRECIMIENTO

La tasa de crecimiento por periodo se refiere al incremento porcentual que tiene un valor determinado en un periodo de tiempo de cualquier variable (Caamal *et al.*, 2016). El procedimiento de cálculo es el siguiente:

$$TC = [(VF / VI) - 1] \times 100$$

Dónde: VF = Valor final; VI = Valor inicial.

Interpretación del indicador: si la tasa de crecimiento es positiva refleja crecimiento y si es negativa señala decrecimiento.

3.3. BALANZA COMERCIAL

La balanza comercial indica el balance del comercio en un período determinado, y es la expresión del flujo comercial neto en el comercio de un país. Puede ser superavitario cuando las exportaciones exceden a las importaciones, y deficitario en el caso en que las exportaciones sean menores que las importaciones, en este caso, los residentes de una economía estarían tomando prestado parte de la producción de otras economías. En términos prácticos, un saldo negativo implica que las importaciones retrajeron renta nacional que fue captada por ciudadanos residentes en otros países (Durán y Álvarez, 2008). El procedimiento de cálculo es el siguiente:

$$BC = X - M$$

Dónde: BC=Balanza comercial; X = importaciones; M = exportaciones.

Interpretación del indicador: Un balance positivo se conoce como un superávit en la balanza comercial, que consiste en exportar más de lo que se importa. Un balance negativo se conoce como un déficit comercial. La balanza comercial a veces se divide en productos y en servicios.

3.4. ÍNDICE DE BALANZA COMERCIAL RELATIVA

El índice de balanza comercial relativa mide la relación entre la balanza comercial de un producto y el comercio total del mismo producto para un país en el mercado mundial o en un mercado específico. El indicador es usado para conocer los productos destinados a la exportación principalmente, puede ser interpretado como un índice de ventaja competitiva (García, 1995). El procedimiento de cálculo es el siguiente:

$$BCR_{ij} = (X_{ij} - M_{ij}) / (X_{ij} + M_{ij})$$

Donde: BCR_{ij}=Balanza comercial relativa del país j respecto al producto i; X_{ij}=Exportaciones del producto i por un país j al mercado mundial; M_{ij}=Importaciones de un producto i por un país j al mercado mundial o un mercado específico; (X_{ij}-M_{ij})=Balanza o saldo comercial; (X_{ij}+M_{ij})=Flujo comercial del producto.

Interpretación del indicador: si BCR: -1 y 0, refleja que el país es un importador neto del producto y el país carece de ventaja competitiva. Si BCR: 0 y 1, señala que el país es un exportador neto del producto y el país tiene ventaja competitiva.

3.5. INDICADOR DE TRANSABILIDAD

El indicador de transabilidad refleja la relación entre el valor de la balanza comercial neta y el valor del consumo aparente. En otras palabras, mide la

capacidad de generar excedentes netos exportables en relación al consumo interno (Velín y Medina, 2011).

Para el comercio exterior, se utiliza para hacer un seguimiento de la ganancia o pérdida de la capacidad exportadora del país que produce el bien. Este se construye sobre otros dos subindicadores, el grado de apertura exportadora que indica la participación de las exportaciones de un producto sobre el consumo aparente y de ésta se refiere al grado de penetración en un mercado específico, y grado de penetración de las importaciones, que muestra la relación entre las importaciones de un bien o sector y su consumo doméstico aparente. El procedimiento de cálculo es el siguiente:

$$ITij = (Xij - Mij) / (Qij + Mij - Xij)$$

Dónde: Xij = Exportaciones del producto i del país j; Mij = Importaciones del producto i del país j.; Qij = Producción doméstica del producto i del país j.

Interpretación del indicador: si es mayor que cero, el sector se considera exportador dado que existe un exceso de oferta ($Xij - Mij > 0$), indica que es un producto competitivo en el mercado interno. Por ejemplo si se considera un solo producto, este indicador señala que el producto es competitivo en el mercado interno. Si por el contrario, el indicador es menor que cero, el sector requiere de importaciones, es un producto importable, y en consecuencia no es competitivo en el mercado interno, dado que existe un exceso de demanda ($Xij - Mij < 0$).

3.6. COEFICIENTE DE DEPENDENCIA COMERCIAL

El coeficiente de dependencia comercial refleja la relación entre el valor de las importaciones y el valor del consumo aparente durante un período de tiempo. El indicador expresa la medida de la competencia internacional por la demanda interna. Mientras mayor sea el coeficiente mayor será la dependencia del consumo interno de las importaciones y, mientras más bajo sea éste implica que el país tiene más capacidad de abastecer la demanda interna con la producción nacional (Velín y Medina, 2011). El procedimiento de cálculo es el siguiente:

$$CDCij = Mij / (Qij + Mij - Xij)$$

Donde: Glij = Grado de penetración de importaciones del producto i en el país j; Mij = Importaciones del producto i del país j; Xij = Exportaciones del producto i del país j; Qij = Producción doméstica del producto i del país j; $(Qij+Mij-Xij)$ = Consumo aparente (demanda efectiva) del bien i en el país j en un período dado.

Interpretación del indicador: el coeficiente tiene un rango entre 0 y 1, a medida que el indicador se acerca a cero, la competitividad del sector o cadena productiva es mayor, y a medida que se aproxima a uno la competitividad del sector o cadena productiva disminuye, dependiendo de las importaciones.

3.7. COEFICIENTE DE EXPORTACIÓN

El coeficiente de exportación refleja la relación que se establece entre el valor de las exportaciones y el valor de la producción durante un período de tiempo. En otras palabras, mide el porcentaje de la producción que se exporta (Velín y Medina, 2011). El procedimiento de cálculo es el siguiente:

$$CEij = (Xij / VPij) * 100$$

Dónde: CEij = Coeficiente de exportación del producto i del país j; Xij = Exportaciones del producto i del país j; VPij = Volumen de producción del producto

i del país j.

Interpretación del indicador: un mayor coeficiente de exportación representa que una mayor proporción de la producción se exporta y un menor coeficiente de exportación significa que una menor proporción de la producción se exporta.

3.8. COEFICIENTE DE ESPECIALIZACIÓN EXPORTADORA

El coeficiente de especialización exportadora indica la participación de las exportaciones de un producto sobre el consumo aparente y de esta manera se refiere al grado de inserción en un mercado específico. El procedimiento de cálculo es el siguiente:

$$GE = X_{ij} / (Q_{ij} + M_{ij} - X_{ij})$$

Donde: GE = Grado de apertura exportadora; X_{ij} = Exportaciones del producto i del país j; M_{ij} = Importaciones del producto i del país j; Q_{ij} = Producción doméstica del producto i del país j; $(Q_{ij} + M_{ij} - X_{ij})$ = Consumo aparente (demanda efectiva) interna del bien i en el país j en un período dado.

Interpretación del indicador: Si el coeficiente es negativo, significa que no hay ningún grado de especialización, por tanto refleja que es un producto altamente importable, y no tiene ventaja comparativa. Si en un periodo de varios años, este indicador se acerca a cero, la competitividad de un país con respecto al resto del mundo está cayendo, ya que no existe la capacidad para sobrepasar el nivel de producción necesario para abastecer la demanda interna del país.

4. RESULTADOS Y DISCUSIÓN

4.1. COMPORTAMIENTO DE LAS VARIABLES DE PRODUCCIÓN EN MÉXICO

4.1.1. SUPERFICIE COSECHADA

El comportamiento de la superficie cosechada de arroz palay en México presentó una tendencia general decreciente, con una tasa de decrecimiento de 52.7% en el periodo de 1994 a 2017, al pasar de 87,796 a 41,560 hectáreas cosechadas, sin embargo, se pueden observar dos periodos con una tendencia creciente, de 1995 a 1997 y del 2002 al 2006, así mismo, se observa un estancamiento de la superficie cosechada durante el periodo del 2014 al 2017.

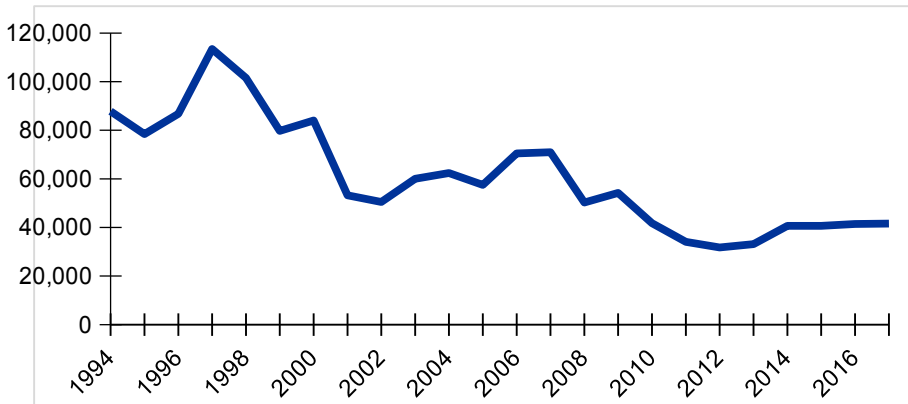


Figura 1. Superficie cosechada de arroz palay en México, 1994-2017 (ha).
Fuente: Elaborado con datos del SIACON, 2019.

4.1.2. RENDIMIENTO

El rendimiento de arroz palay en México tuvo una tendencia creciente en el periodo de análisis (1994-2017), con una tasa de crecimiento de 48.8%, al pasar de 4.3 a 6.4 toneladas por hectárea, observándose un periodo de estancamiento de 1994 a 2007 y, posteriormente, una tendencia creciente del 2008 al 2017.

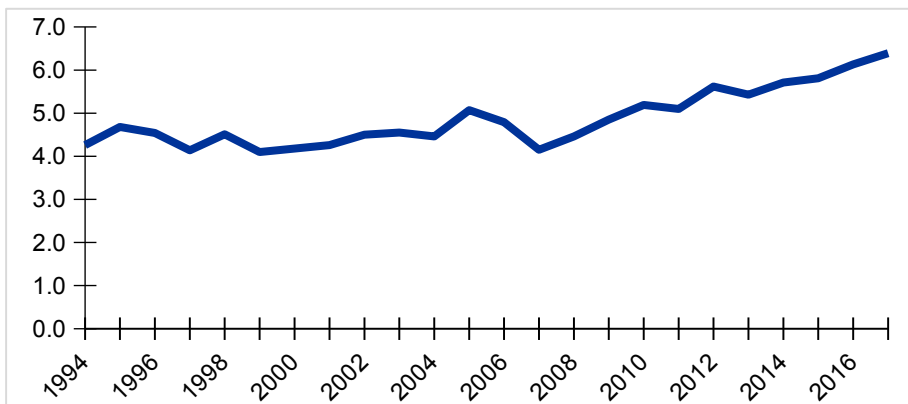


Figura 2. Rendimiento de arroz palay en México, 1994-2017 (ton/ha).
Fuente: Elaborado con datos del SIACON, 2019.

4.1.3. PRODUCCIÓN

La producción de arroz palay en México tuvo un comportamiento con una tendencia general decreciente, pasando de 373,616 a 265,567 toneladas en el periodo de 1994 a 2017, lo que representó una tasa de decrecimiento de 28.9%,

observándose tres periodos de recuperación, de 1995 a 1997, de 2001 al 2006 y de 2011 al 2017.

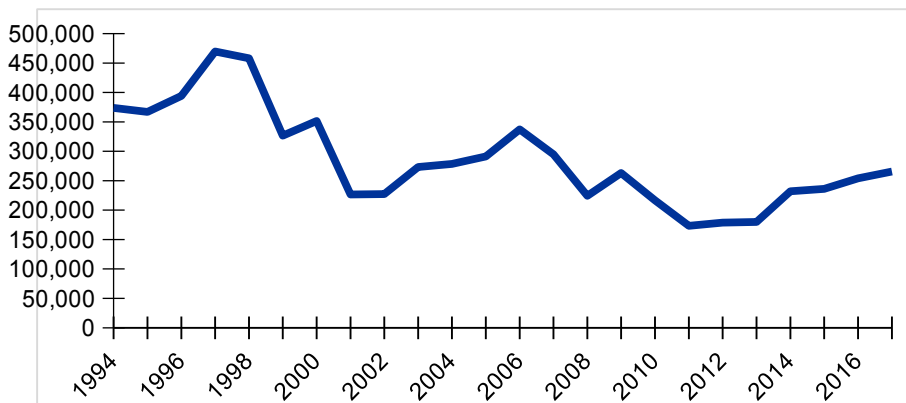


Figura 3. Producción de arroz palay en México, 1994-2017 (ton).

Fuente: Elaborado con datos del SIACON, 2019.

4.2. COMPORTAMIENTO DE LAS VARIABLES DE COMERCIO

4.2.1. EXPORTACIONES

Durante el periodo analizado de 1994 a 2017, las exportaciones de arroz palay en México han sido nulas o muy pequeñas, en comparación con el volumen de las importaciones, observándose en general una disminución del volumen exportado. Solo se tiene registro de exportaciones en los años 1994, 1997, 1998, 2001, 2010, 2011 y 2015, siendo el año 1997 donde se tuvo el mayor volumen exportado, correspondiente a 134 toneladas, mientras que el menor volumen exportado fue en el año 1994, con dos toneladas.

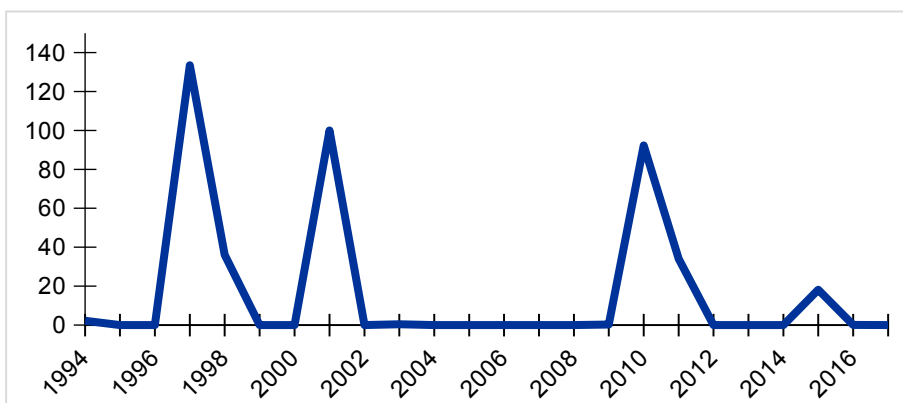


Figura 4. Exportaciones de arroz palay de México, 1994-2017 (ton).

Fuente: Elaborado con datos del USDA (1994-2002) y SIAVI (2003-2017), 2019.

4.2.2. IMPORTACIONES

En cuanto al comportamiento de las importaciones de arroz palay en México, se tiene una tendencia creciente durante el periodo de 1994 a 2017, con una tasa de crecimiento de 383.7%, al pasar de 185,206 a 895,928 toneladas importadas. Se observa una disminución importante de las importaciones en el periodo de 2011 a 2014, sin embargo, a partir del 2015 y hasta el 2017, se observa un fuerte incremento.

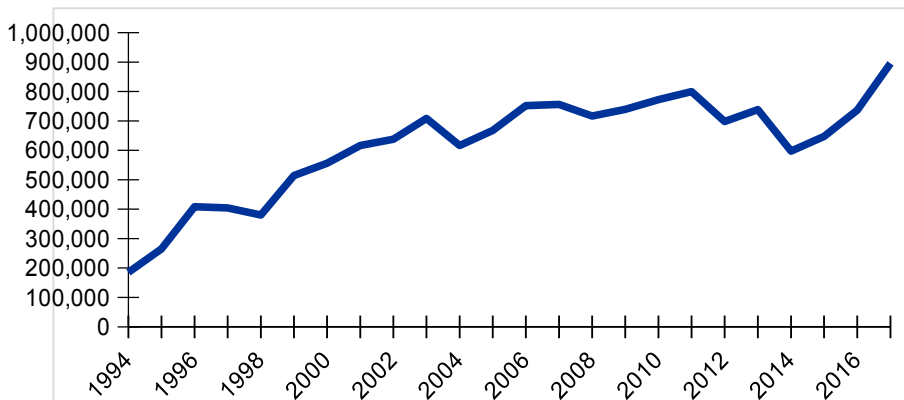


Figura 5. Importaciones de arroz palay de México, 1994-2017 (ton).

Fuente: Elaborado con datos del USDA (1994-2002) y SIAVI (2003-2017), 2019.

4.2.3. BALANZA COMERCIAL

La balanza comercial del arroz palay de México es negativa, puesto que las importaciones son, en todos los años del periodo analizado, mayores que las exportaciones, las cuales son nulas en la mayor parte del periodo analizado. Debido a que en el periodo de análisis, el saldo de la balanza comercial es negativo, y además creciente, se puede afirmar que México es un país netamente importador de arroz palay.

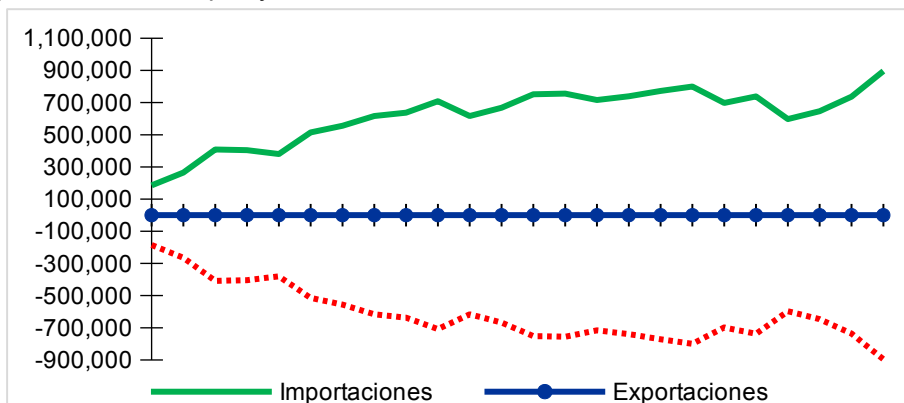


Figura 6. Balanza comercial del arroz palay de México, 1994-2016 (ton).

Fuente: Elaborado con datos del USDA (1994-2002) y SIAVI (2003-2017), 2019.

4.3. INDICADORES DE COMPETITIVIDAD

4.3.1. ÍNDICE DE BALANZA COMERCIAL RELATIVA

De acuerdo con los resultados obtenidos, el índice de balanza comercial relativa en el periodo estudiado, es negativo, con un valor de menos uno en la mayor parte del periodo analizado. Este indicador, al ser negativo, señala la ausencia de ventaja competitiva para México en la exportación de arroz palay. Esto significa que el país es un importador neto, debido a que las importaciones son mayores en gran medida que las exportaciones, es decir, que no se satisface la demanda nacional y, por lo tanto, México es incapaz de ofrecer el producto al mercado internacional.

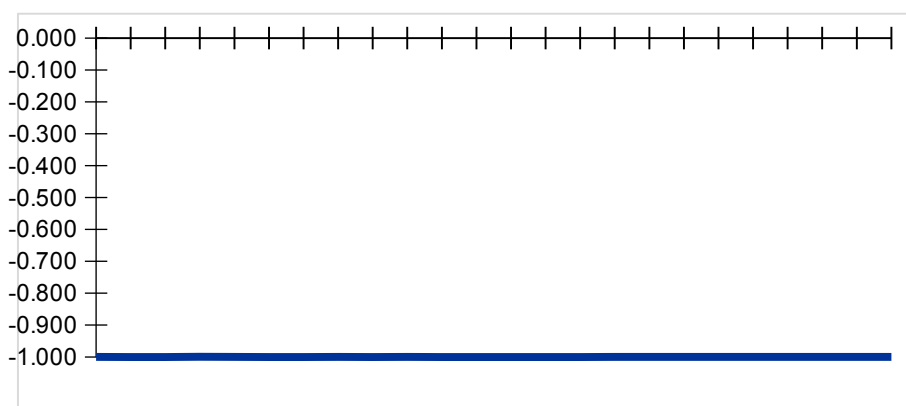


Figura 7. Índice de balanza comercial relativa del arroz palay de México, 1994-2017.

Fuente: Elaborado con datos de USDA, SIACON y SIAVI, 2019.

4.3.2. ÍNDICE DE TRANSABILIDAD

El comportamiento del índice de transabilidad ha mostrado un valor negativo creciente en el periodo analizado, lo que indica que México se considera un país importador, debido a que los valores de los índices obtenidos son menores a cero, por lo que el arroz palay de México carece de competitividad en el mercado internacional.

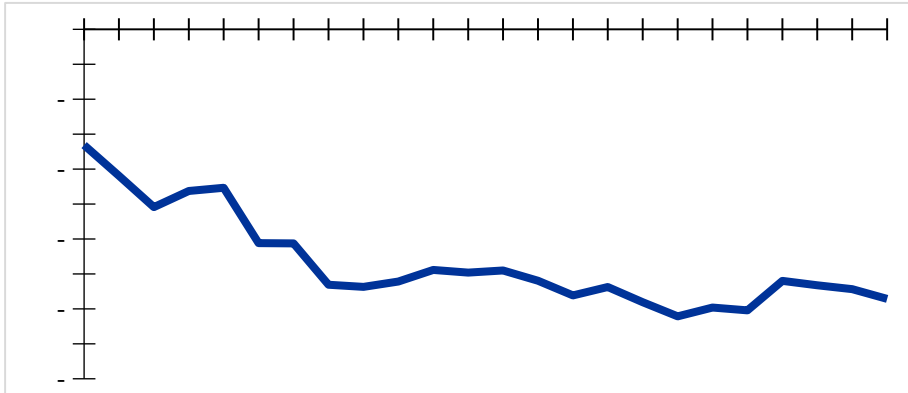


Figura 8. Índice de transabilidad del arroz palay de México, 1994-2017.

Fuente: Elaborado con datos de USDA, SIACON y SIAVI, 2019.

4.3.3. COEFICIENTE DE DEPENDENCIA COMERCIAL

Los resultados obtenidos de este indicador se encuentran entre 0 y 1, con una tendencia creciente y un valor cercano a 0.8 en los últimos años del periodo analizado, lo que significa que la competitividad de la comercialización del arroz palay de México es menor y las exportaciones son pequeñas o nulas.

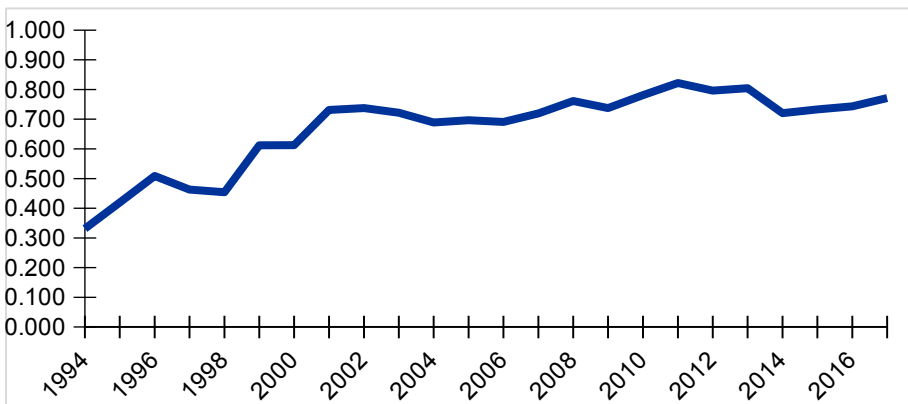


Figura 9. Coeficiente de dependencia comercial del arroz palay de México, 1994-2017.

Fuente: Elaborado con datos de USDA, SIACON y SIAVI, 2019.

4.3.4. COEFICIENTE DE EXPORTACIÓN

Este indicador muestra el porcentaje de la producción que se exporta. El coeficiente de exportación del arroz palay de México, presenta un valor de cero en la mayor parte del periodo analizado. Lo que señala que la producción no satisface la demanda interna y por lo tanto no se generan excedentes exportables.

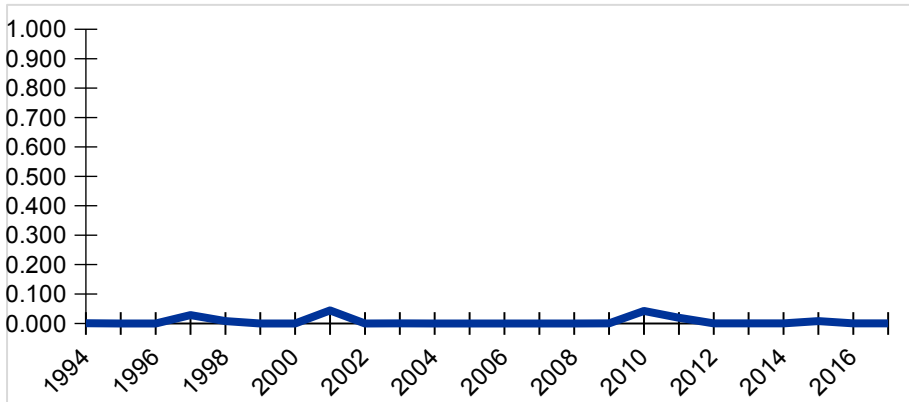


Figura 10. Coeficiente de exportación del arroz palay de México, 1994-2017.

Fuente: Elaborado con datos de USDA, SIACON y SIAVI, 2019.

4.3.5. COEFICIENTE DE ESPECIALIZACIÓN EXPORTADORA

El coeficiente de especialización exportadora indica el grado en que las exportaciones de un producto con respecto a su consumo aparente penetran en un mercado. El coeficiente de especialización exportadora del arroz palay de México tuvo un valor de alrededor de cero en la mayor parte del periodo analizado, lo que señala que el sector carece de vocación exportadora.

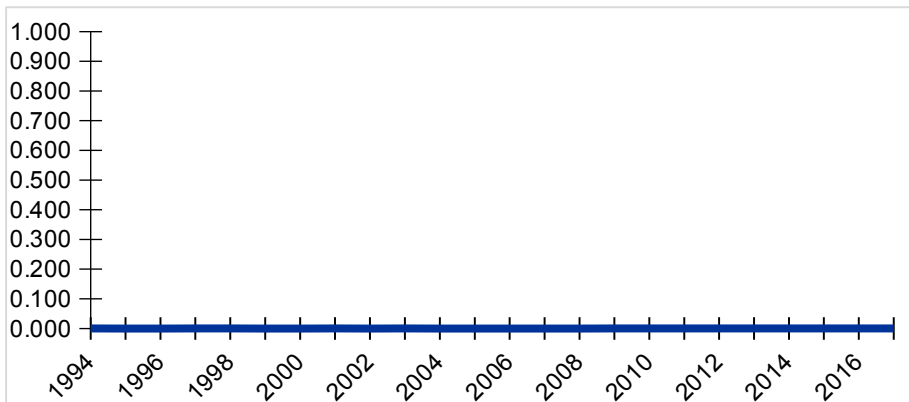


Figura 11. Coeficiente de especialización exportadora del arroz palay de México, 1994-2017.

Fuente: Elaborado con datos de USDA, SIACON y SIAVI, 2019.

5. CONCLUSIONES

Las variables de producción analizadas del cultivo de arroz palay en México tuvieron un decrecimiento en el periodo analizado, a excepción del rendimiento, lo que indica que la disminución de la producción se debe a una menor superficie cosechada, lo que refleja que es un cultivo que se encuentra en contracción y no es rentable. Por otro lado, el comportamiento de las importaciones refleja una tendencia creciente, mientras que las importaciones han sido nulas en la mayor parte del periodo analizado, y de menor magnitud en comparación con las exportaciones, lo que da como resultado un saldo de la balanza comercial negativo o deficitario.

Los indicadores de competitividad calculados, balanza comercial relativa e indicador de transabilidad son negativos; los coeficientes de especialización exportadora y de exportación se encuentran en alrededor de cero; y, el coeficiente de dependencia comercial es positivo, cercano a 0.8. Los resultados obtenidos reflejan que la producción de arroz palay en México ha venido decreciendo y no es competitivo en el mercado internacional.

REFERENCIAS

- BALLESTEROS, A. (2005): *Comercio Exterior. Teoría y Práctica*. Universidad de Murcia.
- BANCO DE COMERCIO EXTERIOR (BANCOMEXT). (2007): *Guía Básica del Exportador*. 12a Edición. México.
- BANCO DE INFORMACIÓN ECONÓMICA (BIE). (2019): Índice nacional de precios al consumidor. México: INEGI. [En línea] Disponible en: <<https://www.inegi.org.mx/sistemas/bie/>>.
- CAAMAL C., I., JERÓNIMO A., F., PAT F., V.G. (2016): Análisis de las variables económicas de la producción de naranja en México. *Revista Mexicana de Ciencia Agrícolas*. México: INIFAP.
- CHACHOLIADES, M. (1992): *Economía Internacional*. 2ª ed. México: McGraw-Hill.
- CHÁVEZ, L. (2008): La política agrícola en México, 2000-2006. *Revista Comercio exterior* 58(7), [En línea] Recuperado de <<http://revistas.bancomext.gob.mx/rce/magazines/121/4/RCE4.pdf>>.
- DURÁN L., J.E. y ALVAREZ, M. (2008): Indicadores de comercio exterior y política comercial: mediciones de posición y dinamismo comercial. Santiago de Chile: ONU.
- FAOSTAT. (2019): Datos. FAO. [En línea]. Consultado el 02 de abril de 2019. Disponible en: <<http://www.fao.org/faostat/es/#data>>.
- GARCÍA R. (1995): Metodología para elaborar Perfiles de Competitividad del Sector Agroalimentario. *Proyecto Multinacional. Apoyo al Comercio y a la Integración en el Área Andina. Documento de trabajo*. Caracas, Venezuela: IICA.
- GUTIERREZ, S. V. (2016): *Análisis de los índices de competitividad del mango producido en México en el mercado mundial*. Tesis de licenciatura. México: Universidad Autónoma Chapingo.
- HERNÁNDEZ, M. (2008): Los determinantes de la competitividad Nacional. Análisis y Reflexiones a partir de un marco teórico conceptual. [En línea] Obtenido de <http://www.utm.mx/edi_antiguos/temas036/ENSAYO2-36.pdf>.
- INSTITUTO MEXICANO PARA LA COMPETITIVIDAD (IMCO). (2017): ¿Qué es Competitividad? – IMCO. IMCO. [En línea] Obtenido de:

<http://imco.org.mx/videos_es/que_es_competitividad_-_imco/>.

LERMA K., A. (2000): Comercio y Mercadotecnia Internacional: Metodología para la formulación de estudios de competitividad empresarial. México: Ediciones International Thomson.

MERCADO, S. (1989): *Comercio internacional: Importación-exportación*. 2ª. ed. México: Limusa.

MURILLO, D. R. (2005): *Sobre el concepto de competitividad*. CEPAL.

ORGANIZACIÓN PARA LA COOPERACIÓN Y EL DESARROLLO ECONÓMICOS (OCDE) (1992): *Technology and the Economy: The key relationships*. París: OCDE.

SARDO, D. (2011): *La Triple Frontera entre Argentina, Brasil y Paraguay. ¿Una macro región basada en el concepto de regionalismo abierto?* PhD Thesis, Università di Ferrara. NY, Estados Unidos de América: Lulu International Press.

SERVICIO DE INFORMACIÓN AGROALIMENTARIA Y PESQUERA (SIAP). (2008): Características de la información. Campo mexicano. México: SAGARPA. [En línea] Obtenido de: <http://www.campomexicano.gob.mx/portal_siap/Integracion/EstadisticaBasica/Agricola/Normatividad/caracteristicasN.htm>

SERVICIO DE INFORMACIÓN AGROALIMENTARIA Y PESQUERA (SIAP). (2010): Situación actual y perspectivas del arroz en México, 1990-2010. México: SAGARPA. [En línea] Recuperado de <http://www.agronuevoleon.gob.mx/oeidruss/ESTUDIOS_E_INVESTIGACIONES/SIAP/arroz.pdf>

SERVICIO DE INFORMACIÓN ARANCELARIA VÍA INTERNET (SIAVI). (2019): Estadísticas anuales. México: Secretaría de Economía. [En línea] Consultado el 02 de abril de 2019. Disponible en: <<http://www.economia-snci.gob.mx/>>.

SISTEMA DE INFORMACIÓN AGROALIMENTARIA DE CONSULTA (SIACON). (2019): Agrícola estatal. México: SIAP-SAGARPA. [En línea] Consultado el 06 de abril de 2019. Disponible en: <<https://www.gob.mx/siap/documentos/siacon-ng-161430>>.

STEIMBERG, F. (2004): La nueva teoría del comercio internacional y la política comercial estratégica. [En línea]. Disponible en: <www.eumed.net/cursecon/libreria/>.

SWAMINATHAN. M.S. (1984): La larga marcha de una poderosa gramínea. *El Correo*, diciembre. UNESCO. [En línea] Recuperado de: <https://unesdoc.unesco.org/ark:/48223/pf0000061955_spa>

UNITED STATES DEPARTMENT OF AGRICULTURE (USDA). (2019): Global Agricultural Trade System. USA: USDA-Foreign Agricultural Services. [En línea] Disponible en: <<https://apps.fas.usda.gov/gats/>>

VELÍN, M. y MEDINA, P. (2011): Cálculo y análisis de indicadores sectoriales de comercio exterior para el caso ecuatoriano. *Analítika*, 2(1). Ecuador: INEC.

ANÁLISIS DEL COMPORTAMIENTO Y COMPETITIVIDAD DE LA PRODUCCIÓN Y COMERCIO DEL CHILE VERDE EN MÉXICO

IGNACIO CAAMAL CAUICH

DICEA-Universidad Autónoma Chapingo
Carretera México-Texcoco, km 38.5 Chapingo, México. C.P. 56230

VERNA GRICEL PAT FERNÁNDEZ

PA-Universidad Autónoma Chapingo
Carretera México-Texcoco, km 38.5 Chapingo, México. C.P. 56230

e-mail Ignacio Caamal Cauich: icaamal82@yahoo.com.mx

Resumen

Las tasas de crecimiento y los índices de competitividad permiten la caracterización del comportamiento de las variables de producción y comercio y de la competitividad del chile verde en México. El comportamiento de las variables de producción y comercio se mide con las tasas de crecimiento y la competitividad con los índices de competitividad. Los principales países productores de chile verde son China continental, México, Turquía, Indonesia y España. El objetivo del trabajo es realizar la caracterización de las tasas de crecimiento de las principales variables económicas de la producción y comercio y de los índices de competitividad del chile verde de México. Las variables económicas estudiadas son superficie cosechada, rendimiento, producción, exportaciones e importaciones y los índices de competitividad calculados son índice de balanza comercial relativa, índice de transabilidad, coeficiente de especialización exportadora y coeficiente de exportación. La información se obtuvo de las bases estadísticas de la Organización de las Naciones Unidas para la Alimentación (FAOSTAT), del Sistema de Información Agroalimentaria de Consulta (SIACON) y del Sistema de Información Arancelaria Vía Internet (SIAVI). Los resultados obtenidos reflejan que las tasas de crecimiento de las variables rendimiento, producción y exportación son positivas y los índices de competitividad de la balanza comercial relativa, de transabilidad, de coeficiente de especialización exportadora y de exportación son positivos. Las tasas de crecimiento positivas de las variables de producción y comercio y los índices de competitividad positivos del chile verde reflejan que es un producto rentable, competitivo y en expansión.

Palabras clave: producción, exportación, importación, índices.

Abstract

Growth rates and competitive rates allow the characterization of the behavior of the production and trade variables and the competitiveness of green chile in Mexico. The behavior of the production and trade variables is measured with the growth rates and competitiveness with the competitiveness indices. The main producers of green chile are Mainland China, Mexico, Turkey, Indonesia and Spain. The objective of the study is to make the characterization of the growth rates of the main economic variables of production and trade and the competitiveness indices of green chile in Mexico. The economic variables studied are harvested area, yield, production, exports and imports and the indices of competitiveness calculated are index of relative trade balance, tradability index, coefficient of export specialization and export coefficient. The information was obtained from the statistical basis of the Food and Agriculture Organization of the United Nations (FAOSTAT), of the Consultation Agro-Food Information System (SIACON) and the System of tariff information Via the Internet (SIAVI). The results obtained show that the growth rates of the yield, production and export variables are positive and the competitiveness indices of the relative trade balance, of the tradeability, export specialization coefficient and export are positive. Positive growth rates of the variables of production and trade and the positive competitiveness indices of green chile reflect that it is a profitable, competitive and expanding product.

Key Words: production, export, import, index.

Área o eje Temático 1: Economía Internacional.

1. INTRODUCCIÓN

El chile verde es considerado como una de las hortalizas más importantes a nivel mundial, esto debido a su alta rentabilidad y a su versatilidad, que permite elaborar diferentes alimentos. A nivel industrial se elabora una gran variedad de productos derivados, entre ellos chiles congelados, deshidratados, encurtidos, enlatados, pastas y una gran variedad de salsas, así mismo se utilizan como materia prima para la obtención de colorantes y de resinas para fines industriales; de igual manera se usa con fines medicinales (SAGARPA, 2017).

Los principales chiles verdes son originarios de Sudamérica (*Capsicum chinense*, *Capsicum pubescens* y *Capsicum baccatum*) y de México (*Capsicum annuum* y *Capsicum frutescens*) (CONABIO, s.f.). Por la extensión del cultivo y el valor económico que representa la producción, *Capsicum annuum* es la especie cultivada más importante en todo el mundo y en México se encuentra la mayor diversidad (CONABIO, s.f.). Las principales variedades producidas en México son el chile jalapeño, poblano, serrano, chilaca y morrón (bell pepper) (SIACON, 2019).

El chile es uno de los cultivos agrícolas más importantes en México, ya que es el principal país donde se produce y consume. El chile es el sexto cultivo con mayor valor generado en la agricultura de México (SIACON, 2019).

La producción de chile verde representa aproximadamente el 17% de la producción de hortalizas en el país (SIACON, 2019) y, a nivel mundial, México se ubica como el segundo productor de chile verde (FAOSTAT, 2019); y los principales destinos de exportación son Estados Unidos de América, Canadá, Reino Unido, Singapur, Países Bajos, entre otros (SIAVI, 2019).

En la actualidad, el comercio global es enorme, los países comercian tanto bienes como servicios en grandes cantidades. Para el caso del chile verde en México, el comportamiento estable de la producción, entre otros factores, ha permitido un aumento en el volumen de las exportaciones dando pie a una mayor participación en el mercado y facilitando que México se ubique como el principal exportador de chile verde a escala internacional y como el segundo productor mundial. Por lo tanto, el análisis y la comprensión de las determinantes de la producción y el comercio del chile verde permitirán implementar herramientas para asegurar que la producción siga siendo rentable e impulsen la competitividad en el comercio internacional.

1.1. PANORAMA MUNDIAL

En el 2016, aproximadamente 123 países producían chile verde en sus diferentes variedades, de los cuales alrededor de 138 lo exportan y 165 lo importan (FAOSTAT, 2019). Ante el aumento de la demanda de este producto, México se ha posicionado como el segundo país productor y el principal exportador del producto.

De acuerdo con la información de la FAOSTAT (2019), la superficie cosechada del chile verde a nivel mundial, ha presentado una tendencia creciente en el periodo de 1994 a 2017, al pasar de 1,235,160 hectáreas en el año 1994 a 1,987,059 hectáreas cosechadas en el año 2017, que fue el punto más alto obtenido en el periodo de estudio. El principal país con mayor superficie cosechada es China,

que representa el 38.2% de la superficie cosechada mundial, le siguen Indonesia con el 15.6% y México con el 8.1%.

El comportamiento del rendimiento promedio mundial del chile verde ha presentado una tendencia creciente en el periodo de 1994 a 2017, pasando de 10.5 a 18.2 ton/ha, siendo el año 2017 donde se tuvo el mayor rendimiento de todo el periodo analizado. Entre los principales países productores de chile verde con mayor rendimiento se encuentran Estados Unidos de América con 36.9 ton/ha, Turquía con 27.6 ton/ha, China continental con 23.5 ton/ha y México con 20.5 ton/ha, sin embargo, hay países que presentan rendimientos más altos, entre los cuales se encuentran Países Bajos con 280.5 ton/ha, Bélgica con 276.0 ton/ha y Reino Unido con 242.0 ton/ha (FAOSTAT, 2019).

La producción ha tenido una tendencia creciente y constante en el periodo de 1994 a 2017, al pasar de 12,976,928 a 36,092,631 toneladas. El principal país productor de chile verde fue China continental con 17,795,349 toneladas, seguido por México con 3,296,875 toneladas, Turquía con 2,608,172 toneladas e Indonesia con 2,359,441 toneladas, destacando China que aporta alrededor del 49% de la producción mundial (FAOSTAT, 2019).

Las exportaciones de chile verde han mostrado una tendencia creciente y constante durante el periodo de 1994 a 2016, pasando de 924,086 a 3,314,149 toneladas exportadas, por lo que es evidente el crecimiento de las exportaciones del producto. Respecto al precio medio de las exportaciones, también se observa una tendencia creciente, fluctuando entre 1,087 y 1,746 dólares por tonelada. Como resultado del comportamiento del precio medio de las exportaciones, el valor de las exportaciones también ha mostrado una tendencia creciente, pasando de 1,107,662,000 a 4,940,931,000 dólares en el mismo periodo, lo que representó un incremento del 346.1% (FAOSTAT, 2019).

En el 2016 México fue el principal país exportador con 949,662 toneladas, seguido por España con 734,088 toneladas y Países Bajos con 396,061 toneladas, entre los principales países exportadores también se encuentra Canadá, Estados Unidos de América, Marruecos, Turquía, China continental, entre otros (FAOSTAT, 2019).

La demanda del chile verde ha venido aumentando, debido al comportamiento de las importaciones durante el periodo de 1994 a 2016, que tuvieron una tendencia creciente y constante, pasando de 831,761 toneladas importadas en el año 1994 a 3,243,207 toneladas importadas en el año 2016. En el año 2016, Estados Unidos de América ocupó el primer lugar en la importación de chile verde con 1,099,663 toneladas importadas, seguido de Alemania con 398,151 toneladas, Reino Unido con 217,449 toneladas, Francia con 164,566 toneladas, Canadá con 134,031 toneladas y Rusia con 112,214 toneladas (FAOSTAT, 2019)

El objetivo del trabajo es realizar la caracterización de las tasas de crecimiento de las principales variables económicas de la producción y comercio y de los índices de competitividad del chile verde de México.

2. MARCO TEÓRICO

2.1. VENTAJAS ABSOLUTA Y COMPARATIVA

El comercio exterior o internacional es la actividad económica basada en los intercambios de bienes, capitales y servicios que lleva a cabo un determinado país con el resto de los países del mundo, regulado por normas internacionales o acuerdos bilaterales (Ballesteros, 2005). El comercio internacional se aborda desde diferentes enfoques, entre los cuales destacan la teoría clásica y la teoría neoclásica del comercio internacional.

De acuerdo con la teoría clásica del comercio internacional, un país puede ser más eficiente que otro en la producción de algunos bienes y menos eficiente que otro en la producción de otros bienes. Independientemente de la causa de la diferencia en la eficiencia, ambos países se pueden beneficiar si cada uno se especializa en la producción de aquellos bienes que puede hacer más eficientemente que el otro. Por ejemplo, los Estados Unidos de América son más eficientes que Brasil en la producción de computadores, en tanto que Brasil es más eficiente que los Estados Unidos de América en la producción de café. Estados Unidos de América debería especializarse, por tanto, en la producción de computadores y Brasil en la de café. Los Estados Unidos de América pueden exportar entonces a Brasil el excedente de producción de computadores, a cambio del excedente brasileño en la producción de café. Este patrón de especialización e intercambio internacional (o división internacional del trabajo) es eficiente y conduce a una mayor producción, tanto de computadores como de café. Principio en el cual se basa la teoría clásica del comercio internacional de Adam Smith (Chacholiades, 1992).

Con la teoría clásica, los países deben aprovechar sus recursos naturales y especializarse en la producción de artículos que gocen de ventajas absolutas. Estas naciones deben exportar esos artículos a fin de poder importar de otras naciones bienes producidos en mejores condiciones y a menores costos que en su territorio, estableciendo así, una división internacional del trabajo, benéfica para todos los países debido a que tendría como resultado un ingreso medio más elevado y mejor distribuido entre todas las naciones (Mercado, 1989).

La teoría clásica del comercio internacional también postula que éste se explica a través de la ventaja comparativa, desarrollada por David Ricardo. Cada nación producirá aquellos bienes en los que goce de una ventaja relativa y mediante el intercambio los distintos países se complementarán, sacarán provecho de sus diferencias. De este modo las diferencias de recursos, capacidades de la fuerza laboral y características del factor capital de los distintos países determinarán los patrones del comercio internacional (Steimberg, 2004).

El planteamiento de los neoclásicos establece como fundamento del comercio internacional a la diferente dotación de factores productivos en cada país, lo cual determina que los países tengan diferentes costos de producción. Los neoclásicos plantean que cada país debe especializarse en la producción de bienes intensivos en el factor más abundante, debido a que eso le proporcionará costos más bajos, así mismo, se debe exportar ese bien e importar el bien que no se produce (Chacholiades, 1992).

Las economías exportadoras son las que fabrican productos, con materias primas propias o importadas y luego los exportan, vendiéndolos en los mercados internacionales (Mercado, 1989). Por otro lado, la exportación se refiere al envío legal de mercancías nacionales o nacionalizadas para su uso o consumo en el extranjero, mientras que la importación se refiere al ingreso legal de mercancías de otros países para su distribución y consumo doméstico (BANCOMEXT, 2007).

El comercio impulsa el crecimiento mundial y de los países, lo que favorece a todos los participantes. Los consumidores disponen de más variedad de productos y la competencia entre los productos locales e importados hace que bajen los precios y aumente la calidad. La liberalización del comercio permite que los productores más eficientes compitan en condiciones de equidad con sus homólogos de otros países (Sardo, 2011).

De los elementos anteriores se desprende que a la mayoría de países les resulta favorable el comercio internacional, siendo éste una fuente de ingresos, y de este modo dichos países intentan mejorar la producción, calidad y comercialización de aquellos productos que les es más fácil producir, aprovechando las ventajas comparativas de su territorio, por ejemplo: condiciones climáticas, geografía, disposición de mano de obra, personal capacitado, entre otros. De este modo cada país produce lo que mejor hace o lo que menos costos le implican producirlo.

2.2. COMPETITIVIDAD

A lo largo del tiempo se han desarrollado o surgido muchos conceptos acerca de la competitividad, que intentan explicar el significado y como funciona en el mercado mundial, he aquí algunas de ellas.

Según Lerma (2000) la competitividad en términos comerciales significa la posibilidad de triunfar sobre otros oferentes cuando, al confrontarse con los productos sustitutos, se tiene alta posibilidad de salir victorioso, favorecidos por la compra del consumidor. La competitividad en el ámbito del comercio exterior depende de condiciones que están presentes en los siguientes dos niveles:

1. Macro y estructural. Que comprende las condiciones básicas y generales del país o región necesarios para que las empresas puedan operar con eficiencia.
2. Micro y estructural. En el que se encuentran las condiciones a nivel empresa y producto que puede hacer que la mercancía se desplace exitosamente en los mercados meta.

El Instituto Mexicano para la Competitividad (2017) define a la competitividad como una forma de medir la economía en relación a los demás, es como una carrera donde importa que tan bien le vaya a uno respecto a los otros, en otras palabras, la competitividad es la capacidad para atraer y retener talento e inversión.

La Comisión Económica para América Latina y el Caribe (CEPAL), citado por Gutiérrez (2016), considera que la competitividad autentica debe estar basada en la incorporación de tecnología y el uso renovable de los recursos naturales, concepción que contrasta con la competitividad espuria que se basa en la explotación de los recursos humanos y naturales.

Para la organización de Cooperación para el Desarrollo Económico (OCDE), la competitividad se define como el grado en que un país es capaz de producir, bajo condiciones de libre mercado, bienes y servicios acorde a las necesidades de los

mercados internacionales, manteniendo o incrementando, paralelamente, los ingresos reales de la población en el largo plazo (OCDE, 1992).

2.3. DETERMINANTES DE LA COMPETITIVIDAD

De acuerdo con Porter (1991), citado por Hernández (2008), una nación alcanza el éxito en un sector basada en 4 atributos genéricos:

1. Condiciones de los factores. Son la dotación de factores con los que cuenta un país.
2. Condiciones de la demanda. Significa la naturaleza de la demanda interior de los productos o servicios del sector. Según el autor hay cuatro características para que la composición de la demanda interior obtenga ventaja competitiva nacional:
 - a) Estructura segmentada de la demanda o distribución de la demanda para unas variedades en particular.
 - b) Compradores entendidos y exigentes. Es un mecanismo que permite observar las necesidades de los clientes más avanzados.
 - c) Necesidades precursoras de los compradores.
 - d) El tamaño del mercado interior.
3. Sectores afines y de apoyo. Hace alusión a la existencia o ausencia de sectores proveedores y sectores afines dentro del país, los cuales de ser competitivos generan apoyos especiales a las empresas que exportan mercancías o servicios.
4. Estrategia, estructura y rivalidad de las empresas. Hace alusión a las condiciones vigentes respecto a la forma en que se crean, organizan y gestionan las empresas.

2.4. ÍNDICES DE COMPETITIVIDAD

Los índices de competitividad son valores que miden el desempeño económico de una nación, reflejando las variables que permiten determinar el desempeño competitivo en cuanto a precios de un país con otros, ya sea de bienes o servicios (Murillo, 2005).

2.5. VARIABLES DE PRODUCCIÓN

Entre las variables de producción (SIAP, 2008) que se analizaron se encuentran:

Superficie sembrada. La superficie sembrada es la superficie agrícola en la cual se deposita la semilla de cualquier cultivo.

Superficie cosechada. La superficie cosechada es la superficie de la cual se obtuvo producción, esta variable se genera a partir de que inicia la recolección.

Rendimiento. El rendimiento es el resultado de la división de la producción obtenida entre la superficie cosechada.

Producción. La producción es el volumen de producción que se logró levantar en determinada superficie cosechada.

Precio medio rural. El precio medio rural se define como el precio pagado al productor en la venta de primera mano.

Valor de la producción. Es el valor total de la producción obtenida a nivel nacional.

3. METODOLOGÍA

3.1. FUENTES DE INFORMACIÓN Y VARIABLES

La información utilizada se obtuvo de bases de datos estadísticos de la Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAOSTAT), del Sistema de Información Arancelaria Vía Internet (SIAVI), del Sistema de Información Agroalimentaria de Consulta (SIACON), del Sistema de Información Agroalimentaria y Pesquera (SIAP) y del Sistema de Información Arancelaria Vía Internet (SIAVI) de México. La información obtenida fue de las variables de producción y comercio (superficie cosechada, rendimiento, producción, valor de la producción, exportaciones, importaciones y balanza comercial). Se calcularon las tasas de crecimiento y los indicadores de competitividad del comercio del chile verde de México.

3.2. TASA DE CRECIMIENTO

La tasa de crecimiento por periodo se refiere al incremento porcentual que tiene un valor determinado en un periodo de tiempo de cualquier variable (Caamal et al., 2016). El procedimiento de cálculo es el siguiente:

$$TC = [(VF / VI) - 1] \times 100$$

Dónde: VF = Valor final; VI = Valor inicial.

Interpretación del indicador: si la tasa de crecimiento es positiva refleja crecimiento y si es negativa señala decrecimiento.

3.3. BALANZA COMERCIAL

La balanza comercial indica el balance del comercio en un período determinado, y es la expresión del flujo comercial neto en el comercio de un país. Puede ser superavitario cuando las exportaciones exceden a las importaciones, y deficitario en el caso en que las exportaciones sean menores que las importaciones, en este caso, los residentes de una economía estarían tomando prestado parte de la producción de otras economías. En términos prácticos, un saldo negativo implica que las importaciones retrajeron renta nacional que fue captada por ciudadanos residentes en otros países (Durán y Alvarez, 2008). El procedimiento de cálculo es el siguiente:

$$BC = X - M$$

Dónde: BC=Balanza comercial; X = importaciones; M = exportaciones.

Interpretación del indicador: Un balance positivo se conoce como un superávit en la balanza comercial, que consiste en exportar más de lo que se importa. Un balance negativo se conoce como un déficit comercial. La balanza comercial a veces se divide en productos y en servicios.

3.4. ÍNDICE DE BALANZA COMERCIAL RELATIVA

El índice de balanza comercial relativa mide la relación entre la balanza comercial de un producto y el comercio total del mismo producto para un país en el mercado mundial o en un mercado específico. El indicador es usado para conocer los productos destinados a la exportación principalmente, puede ser interpretado

como un índice de ventaja competitiva (García, 1995). El procedimiento de cálculo es el siguiente:

$$BCR_{ij} = (X_{ij} - M_{ij}) / (X_{ij} + M_{ij})$$

Donde: BCR_{ij} =Balanza comercial relativa del país j respecto al producto i ; X_{ij} =Exportaciones del producto i por un país j al mercado mundial; M_{ij} =Importaciones de un producto i por un país j al mercado mundial o un mercado específico; $(X_{ij}-M_{ij})$ =Balanza o saldo comercial; $(X_{ij}+M_{ij})$ =Flujo comercial del producto.

Interpretación del indicador, si BCR : -1 y 0, refleja que el país es un importador neto del producto y el país carece de ventaja competitiva. Si BCR : 0 y 1, señala que el país es un exportador neto del producto y el país tiene ventaja competitiva.

3.5. INDICADOR DE TRANSABILIDAD

El indicador de transabilidad refleja la relación entre el valor de la balanza comercial neta y el valor del consumo aparente. En otras palabras, mide la capacidad de generar excedentes netos exportables en relación al consumo interno (Velín y Medina, 2011).

Para el comercio exterior, se utiliza para hacer un seguimiento de la ganancia o pérdida de la capacidad exportadora del país que produce el bien. Este se construye sobre otros dos subindicadores, el grado de apertura exportadora que indica la participación de las exportaciones de un producto sobre el consumo aparente y de ésta se refiere al grado de penetración en un mercado específico, y grado de penetración de las importaciones, que muestra la relación entre las importaciones de un bien o sector y su consumo doméstico aparente. El procedimiento de cálculo es el siguiente:

$$IT_{ij} = (X_{ij} - M_{ij}) / (Q_{ij} + M_{ij} - X_{ij})$$

Dónde:

X_{ij} = Exportaciones del producto i del país j ; M_{ij} = Importaciones del producto i del país j .; Q_{ij} = Producción doméstica del producto i del país j .

Interpretación del indicador: si es mayor que cero, el sector se considera exportador dado que existe un exceso de oferta ($X_{ij} - M_{ij} > 0$), indica que es un producto competitivo en el mercado interno. Por ejemplo si se considera un solo producto, este indicador señala que el producto es competitivo en el mercado interno. Si por el contrario, el indicador es menor que cero, el sector requiere de importaciones, es un producto importable, y en consecuencia no es competitivo en el mercado interno, dado que existe un exceso de demanda ($X_{ij} - M_{ij} < 0$).

3.6. COEFICIENTE DE EXPORTACIÓN

El coeficiente de exportación refleja la relación que se establece entre el valor de las exportaciones y el valor de la producción durante un período de tiempo. En otras palabras, mide el porcentaje de la producción que se exporta (Velín y Medina, 2011). El procedimiento de cálculo es el siguiente:

$$CE_{ij} = (X_{ij} / VP_{ij}) * 100$$

Dónde: CE_{ij} = Coeficiente de exportación del producto i del país j ; X_{ij} = Exportaciones del producto i del país j ; VP_{ij} = Volumen de producción del producto

i del país j.

Interpretación del indicador: un mayor coeficiente de exportación representa que una mayor proporción de la producción se exporta y un menor coeficiente de exportación significa que una menor proporción de la producción se exporta.

3.7. COEFICIENTE DE ESPECIALIZACIÓN EXPORTADORA

El coeficiente de especialización exportadora indica la participación de las exportaciones de un producto sobre el consumo aparente y de esta manera se refiere al grado de inserción en un mercado específico. El procedimiento de cálculo es el siguiente:

$$GE = X_{ij} / (Q_{ij} + M_{ij} - X_{ij})$$

Donde: GE = Grado de apertura exportadora; X_{ij} = Exportaciones del producto i del país j; M_{ij} = Importaciones del producto i del país j; Q_{ij} = Producción doméstica del producto i del país j; $(Q_{ij} + M_{ij} - X_{ij})$ = Consumo aparente (demanda efectiva) interna del bien i en el país j en un período dado.

Interpretación del indicador: Si el coeficiente es negativo, significa que no hay ningún grado de especialización, por tanto refleja que es un producto altamente importable, y no tiene ventaja comparativa. Si en un periodo de varios años, este indicador se acerca a cero, la competitividad de un país con respecto al resto del mundo está cayendo, ya que no existe la capacidad para superar el nivel de producción necesario para abastecer la demanda interna del país.

4. RESULTADOS Y DISCUSIÓN

4.1. COMPORTAMIENTO DE LAS VARIABLES DE PRODUCCIÓN EN MÉXICO

4.1.1. SUPERFICIE COSECHADA

El comportamiento de la superficie cosechada presentó una tendencia general decreciente, con una tasa de decrecimiento de 52.7% en el periodo analizado (1994-2017), sin embargo, se pueden distinguir dos periodos, uno con una tendencia decreciente de 1994 a 2009 y otro con una tendencia creciente del 2010 a 2017.

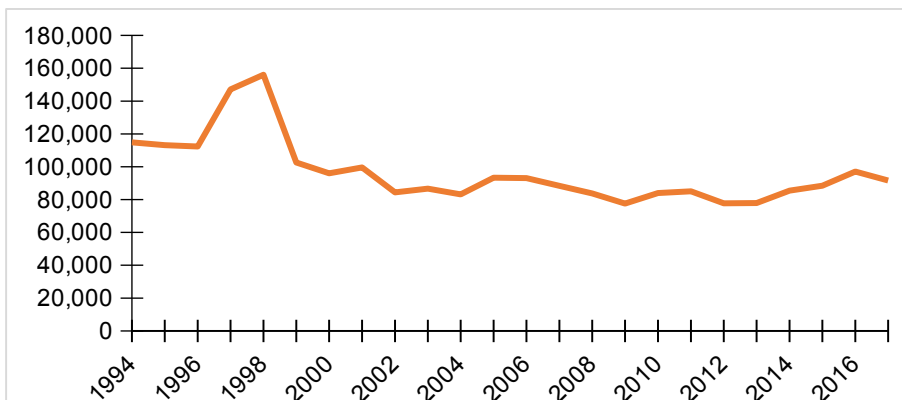


Figura 1. Superficie cosechada de chile verde en México, 1994-2017 (ha).

Fuente: Elaborado con datos del SIACON, 2019.

4.1.2. RENDIMIENTO

En general, el rendimiento tiene una tendencia creciente en el periodo de análisis, con una tasa de crecimiento de 242.4%, pasando de 8.6 a 29.4 toneladas por hectárea, sin embargo, se observan algunos altibajos importantes en el periodo del 2006 al 2015.

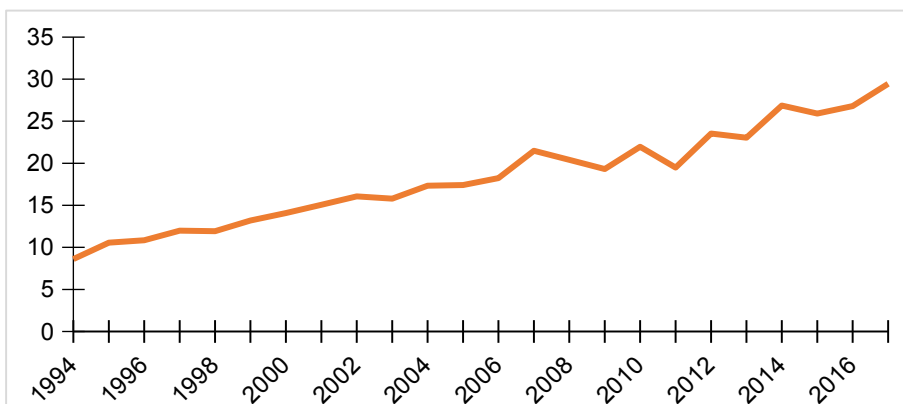


Figura 2. Rendimiento de chile verde en México, 1994-2017 (ton/ha).

Fuente: Elaborado con datos del SIACON, 2019.

4.1.3. PRODUCCIÓN

La producción de chile verde en México tiene un comportamiento con una tendencia general creciente, pasando de 987,485 a 2,697,083 toneladas en el periodo de 1994 a 2017, lo que representó una tasa de crecimiento de 173.1%, sin embargo, se observan dos caídas importantes de la producción en los periodos de 1998 a 1999 y del 2007 al 2009.

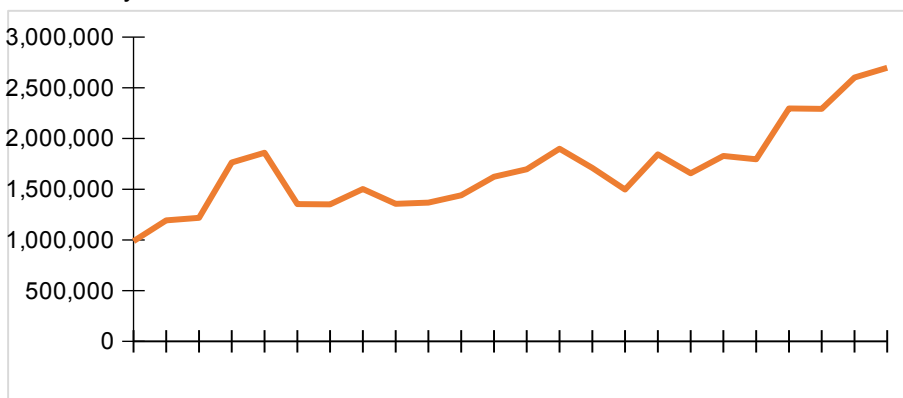


Figura 3. Producción de chile verde en México, 1994-2017 (ton).

Fuente: Elaborado con datos del SIACON, 2019.

4.1.4. VALOR REAL DE LA PRODUCCIÓN

El comportamiento del valor real de la producción, tuvo una tendencia creciente en el periodo de 2002 al 2017, mientras que en el periodo de 1994 al 2001 la tendencia fue decreciente.

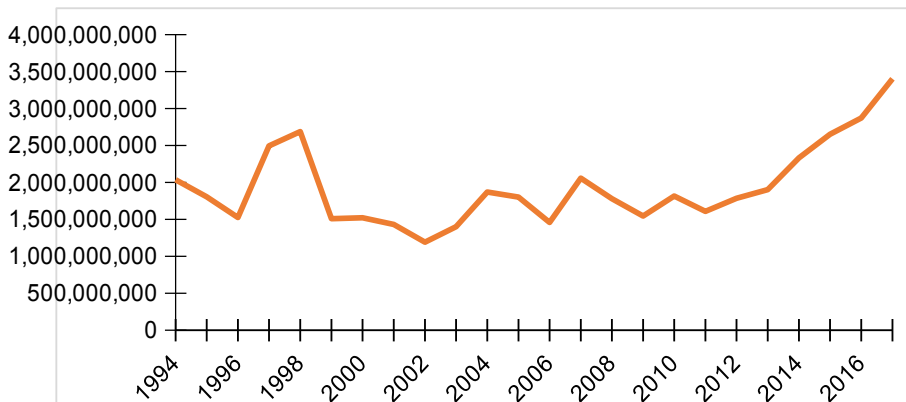


Figura 4. Valor de la producción real del chile verde de México, 1994-2017 (pesos, base 1994).

Fuente: Elaborado con datos del SIACON y del BIE, 2019.

4.2. COMPORTAMIENTO DE LAS VARIABLES DE COMERCIO

4.2.1. EXPORTACIONES

EL comportamiento de las exportaciones de chile verde en México, en el periodo 1994-2017, se ha mantenido con una tendencia general creciente, con una tasa de crecimiento de 435.5%, al pasar de 194,722 a 1,042,752 toneladas exportadas. Las exportaciones totales de chile verde ascendieron a 1,163.4 millones de dólares en 2017.

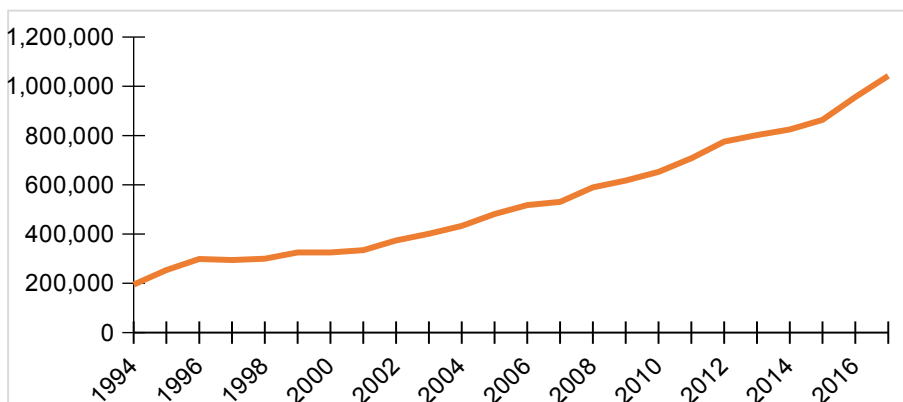


Figura 5. Exportaciones de chile verde de México, 1994-2017 (ton).

Fuente: Elaborado con datos del FAOSTAT (1994-2002) y SIAVI (2003-2017), 2019.

4.2.2. IMPORTACIONES

En cuanto al comportamiento de las importaciones de chile verde en México, se tiene que la tendencia es decreciente durante el periodo de 1994-2017, con una tasa de decrecimiento de 17.6%, al pasar de 2,547 a 2,099 toneladas importadas, sin embargo, se observan dos periodos importantes, uno de 1994 a 2007 con una tendencia creciente, alcanzando el volumen de importaciones más alto de todo el periodo en el año 2007, con 7,649 toneladas importadas, mientras que en el periodo de 2008 a 2017, se tiene una tendencia decreciente de las importaciones de chile verde de México. Las importaciones para el año 2017 correspondieron a 0.9 millones de dólares.

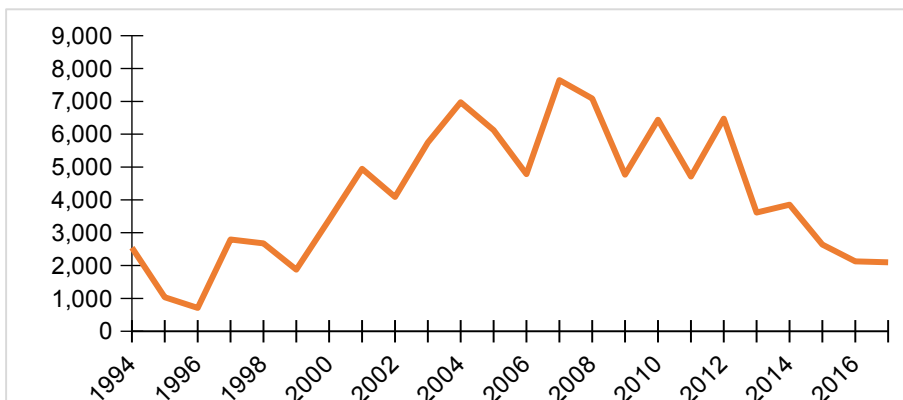


Figura 6. Importaciones de chile verde de México, 1994-2017 (ton).

Fuente: Elaborado con datos del FAOSTAT (1994-2002) y SIAVI (2003-2017), 2019.

4.2.3. BALANZA COMERCIAL

La balanza comercial del chile verde de México es positiva ya que las exportaciones son, en todos los años del periodo analizado, mayores que las importaciones, con una diferencia muy significativa. Debido a que el saldo de la balanza comercial es positivo, y además creciente, en el periodo de análisis, se puede afirmar que México es un país netamente exportador de chile verde.

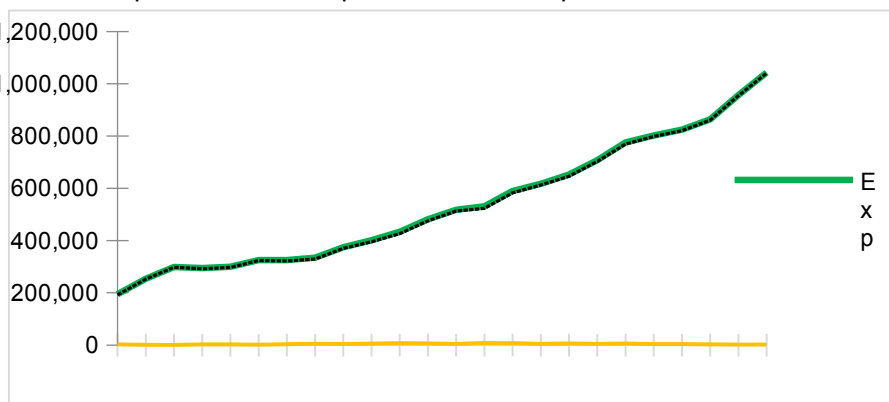


Figura 7. Balanza comercial del chile verde de México, 1994-2016 (ton).

Fuente: Elaborado con datos del FAOSTAT (1994-2002) y SIAVI (2003-2017), 2019.

4.3. INDICADORES DE COMPETITIVIDAD

4.3.1. ÍNDICE DE BALANZA COMERCIAL RELATIVA

De acuerdo con los resultados obtenidos, el índice de balanza comercial relativa en el periodo estudiado, es positivo y cercano a uno, mostrando una tendencia creciente del 2005 al 2017. Este indicador, al encontrarse entre 0 y 1, señala la presencia de una ventaja competitiva para México en la exportación de chile verde. Esto significa que el país es un exportador neto, debido a que las exportaciones son mayores en gran medida que las importaciones, es decir, además de satisfacer la demanda nacional también es capaz de ofrecer el producto al mercado internacional.

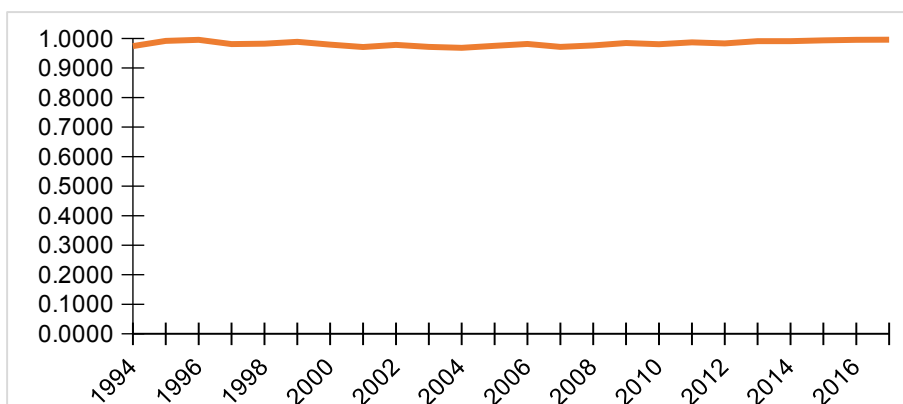


Figura 8. Índice de balanza comercial relativa de México, 1994-2017.

Fuente: Elaborado con datos de FAOSTAT, SIACON y SIAVI, 2019.

4.3.2. ÍNDICE DE TRANSABILIDAD

El comportamiento del índice de transabilidad ha sido creciente y, de acuerdo a los datos obtenidos, México se considera un país exportador, debido a que los valores de los índices obtenidos son mayores a cero, por lo que el chile verde es un producto competitivo en el mercado internacional. A partir de 1994 al 2013 se observa una tendencia creciente, con una fuerte caída de 2013 al 2014.

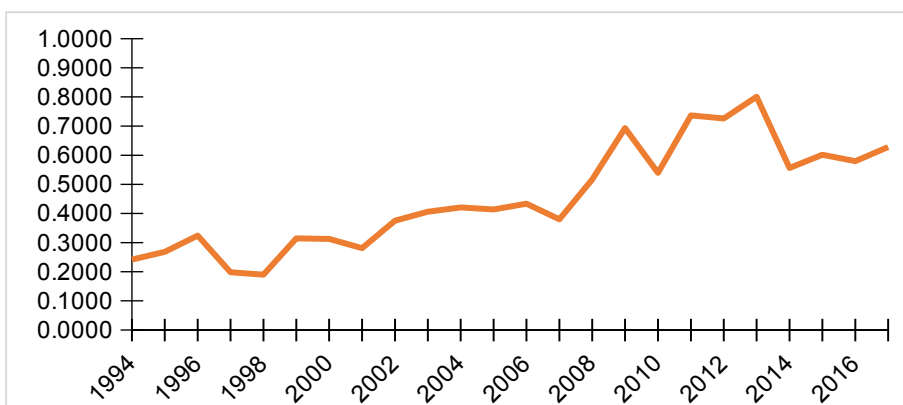


Figura 9. Índice de transabilidad del chile verde de México, 1994-2017.
Fuente: Elaborado con datos de FAOSTAT, SIACON y SIAVI, 2019.

4.3.3. COEFICIENTE DE EXPORTACIÓN

Este indicador muestra el porcentaje de la producción que se exporta. El coeficiente de exportación muestra una tendencia general creciente. Se puede observar que a lo largo del periodo de estudio se ha exportado una buena parte de la producción, teniendo su nivel más bajo en el año 1998 con un 16% de la producción total que fue exportada y alcanzando el valor más alto en el 2013, con el 45% de la producción.

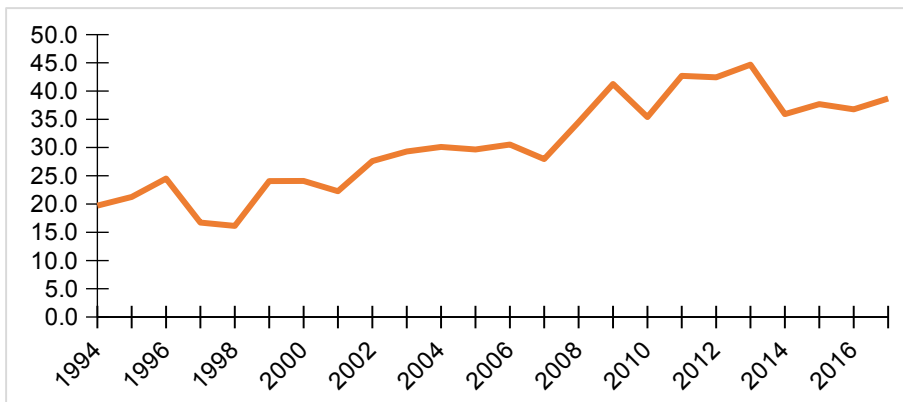


Figura 10. Coeficiente de exportación del chile verde de México, 1994-2017.
Fuente: Elaborado con datos de FAOSTAT, SIACON y SIAVI, 2019.

4.3.4. COEFICIENTE DE ESPECIALIZACIÓN EXPORTADORA

El coeficiente de especialización exportadora indica el grado en que las exportaciones de un producto con respecto a su consumo aparente penetran en un mercado. El coeficiente de especialización exportadora del chile verde de México tuvo una tendencia creciente en el periodo de 1994 al 2017. Por la

tendencia creciente del indicador se puede decir que el sector puede tener una vocación exportadora.

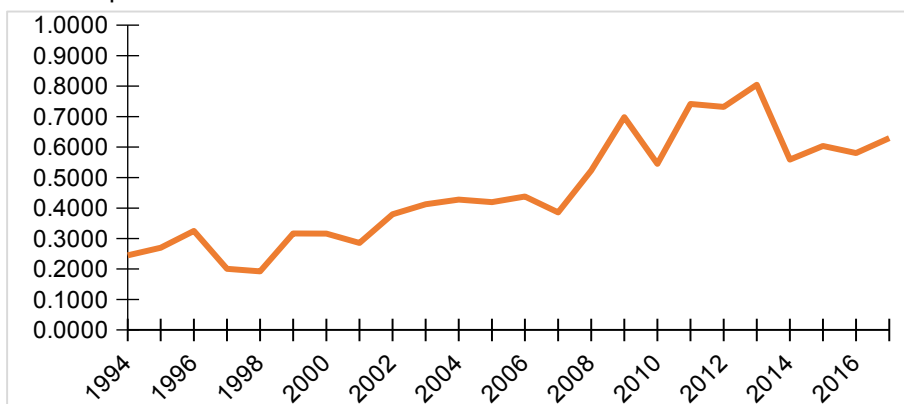


Figura 11. Coeficiente de especialización exportadora del chile verde de México, 1994-2017.

Fuente: Elaborado con datos de FAOSTAT, SIACON y SIAVI, 2019.

5. CONCLUSIONES

El chile verde es considerado como una de las hortalizas más importantes a nivel mundial, ésto debido a su alta rentabilidad y a su versatilidad, que permite darle una gran variedad de usos.

De acuerdo con datos de FAOSTAT, México ocupa el segundo lugar entre los principales países productores de chile verde a nivel mundial y es el principal país exportador, destinando la mayor parte de las exportaciones a Estados Unidos de América.

Las variables de producción analizadas del cultivo de chile verde en México se incrementaron en el periodo analizado, a excepción de la superficie cosechada, lo que indica que el aumento de la producción se debe al incremento del rendimiento, lo que refleja que es un cultivo que se encuentra en expansión y es rentable. Por otro lado, el comportamiento de las exportaciones refleja una tendencia creciente mientras que las importaciones han venido disminuyendo, las cuales han sido de menor magnitud, lo que genera como resultado un saldo de la balanza comercial positiva o superavitaria.

Los indicadores de competitividad calculados, balanza comercial relativa, indicador de transabilidad, coeficiente de exportación y coeficiente de especialización exportadora, son positivos, por lo que se concluye que México es un país competitivo en el mercado interno y en el mercado internacional del chile verde, lo que indica que la producción nacional es suficiente para abastecer la demanda interna y una parte de la demanda externa de este producto.

REFERENCIAS

- BALLESTEROS, A. (2005): *Comercio Exterior. Teoría y Práctica*. Universidad de Murcia.
- BANCO DE COMERCIO EXTERIOR (BANCOMEXT). (2007): *Guía Básica del Exportador*. 12a Edición. México.
- BANCO DE INFORMACIÓN ECONÓMICA (BIE). (2019): Índice nacional de precios al consumidor. INEGI: México. [En línea] Disponible en: <<https://www.inegi.org.mx/sistemas/bie/>>.
- CAAMAL C., I., JERÓNIMO A., F., PAT F., V.G. (2016): Análisis de las variables económicas de la producción de naranja en México. *Revista Mexicana de Ciencia Agrícolas*. México: INIFAP.
- CHACHOLIADES, M. (1992): *Economía Internacional*. 2ª ed. México: McGraw-Hill.
- COMISIÓN NACIONAL PARA EL CONOCIMIENTO Y USO DE LA BIODIVERSIDAD (CONABIO). (s.f.): Chile. CONABIO: México. [En línea] Consultado el 01 de abril de 2019. Disponible en: <<https://www.biodiversidad.gob.mx/usos/alimentacion/chile.html>>
- DURÁN L., J.E. y ALVAREZ, M. (2008): *Indicadores de comercio exterior y política comercial: mediciones de posición y dinamismo comercial*. Santiago de Chile: ONU.
- FAOSTAT. (2019): Datos. FAO. [En línea]. Consultado el 02 de abril de 2019. Disponible en: <<http://www.fao.org/faostat/es/#data>>.
- GARCÍA R. (1995): Metodología para elaborar Perfiles de Competitividad del Sector Agroalimentario. *Proyecto Multinacional. Apoyo al Comercio y a la Integración en el Área Andina*. Documento de trabajo. Caracas, Venezuela: IICA.
- GUTIERREZ, S. V. (2016): Análisis de los índices de competitividad del mango producido en México en el mercado mundial. Tesis de licenciatura. México: Universidad Autónoma Chapingo.
- HERNÁNDEZ, M. (2008): Los determinantes de la competitividad Nacional. Análisis y Reflexiones a partir de un marco teórico conceptual. [En línea] Obtenido de <http://www.utm.mx/edi_anteriores/temas036/ENSAYO2-36.pdf>.
- INSTITUTO MEXICANO PARA LA COMPETITIVIDAD (IMCO). (2017): ¿Qué es Competitividad? – IMCO. IMCO. [En línea] Obtenido de <http://imco.org.mx/videos_es/que_es_competitividad_-_imco/>.
- LERMA K., A. (2000): *Comercio y Mercadotecnia Internacional: Metodología para la formulación de estudios de competitividad empresarial*. México: Ediciones International Thomson.
- MERCADO, S. (1989): *Comercio internacional: Importación-exportación*. 2ª. ed. México: Limusa.
- MURILLO, D. R. (2005): *Sobre el concepto de competitividad*. CEPAL.
- ORGANIZACIÓN PARA LA COOPERACIÓN Y EL DESARROLLO ECONÓMICOS (OCDE) (1992): *Technology and the Economy: The key relationships*. París: OCDE.
- SAGARPA (2017): Planeación agrícola nacional 2017-2030. Chile y pimientos mexicanos. SAGARPA: México. Recuperado el 11 de junio de 2018. [En línea] Disponible en: <<https://www.gob.mx/sagarpa/documentos/planeacion-agricola-nacional-2017-2030>>.
- SARDO, D. (2011): *La Triple Frontera entre Argentina, Brasil y Paraguay. ¿Una macro región basada en el concepto de regionalismo abierto?* PhD Thesis, Università di Ferrara. NY, Estados Unidos de América: Lulu International Press.
- SERVICIO DE INFORMACIÓN AGROALIMENTARIA Y PESQUERA (SIAP). (2008): Características de la información. Campo mexicano. SAGARPA: México. [En línea] Obtenido de:

<http://www.campomexicano.gob.mx/portal_siap/Integracion/EstadisticaBasica/Agricola/Normatividad/caracteristicasN.htm>.

SERVICIO DE INFORMACIÓN ARANCELARIA VÍA INTERNET (SIIVI). (2018): Estadísticas anuales. Secretaría de Economía. México. [En línea] Consultado el 02 de abril de 2019. Disponible en: <<http://www.economia-snci.gob.mx/>>.

SISTEMA DE INFORMACIÓN AGROALIMENTARIA DE CONSULTA (SIACON). (2019): Agrícola estatal. SIAP-SAGARPA: México. [En línea] Consultado el 02 de abril de 2019. Disponible en: <<https://www.gob.mx/siap/documentos/siacon-ng-161430>>.

STEIMBERG, F. (2004): La nueva teoría del comercio internacional y la política comercial estratégica. [En línea]. Disponible en: <www.eumed.net/cursecon/libreria/>.

VELÍN, M. y MEDINA, P. (2011): Cálculo y análisis de indicadores sectoriales de comercio exterior para el caso ecuatoriano. *Analitika*, 2 (1). Ecuador: INEC.

PROFUNDIZANDO EN EL FENÓMENO DEL TEXTIL TÉCNICO: INNOVACIÓN Y ESTRATEGIAS DE NETWORKING EN CLÚSTERES MADUROS

ROSARIO MATEU GARCÍA

Universidad Miguel Hernández de Elche
Avda. Universidad, s/n., 03202 ELCHE
(Alicante)/rmateu@umh.es

JOSE VICENTE TOMÁS MIQUEL

Escuela Politécnica Superior de Alcoy/Universitat Politècnica de València
Pl. Ferrándiz Carbonell, s/n 03801 Alcoy (Alicante)/jotomi @ doe.upv.es

MANUEL EXPÓSITO LANGA

Escuela Politécnica Superior de Alcoy/Universitat Politècnica de València
Pl. Ferrándiz Carbonell, s/n. 03801 Alcoy (Alicante)/maexlan@doe.upv.es

JOSÉ ANTONIO BELSO MARTÍNEZ

Universidad Miguel Hernández de Elche
Avda. Universidad, s/n., 03202 ELCHE (Alicante)/jbelso@umh.es

e-mail Rosario Mateu García: rmateu@umh.es

Resumen

Las numerosas pruebas empíricas corroboran las ventajas derivadas de la colocación espacial y del *networking* para la innovación de las empresas en la industria textil. No obstante, las empresas se benefician de estas ventajas dependiendo de su cartera de relaciones. En consecuencia, las empresas de los clústeres construyen sus redes de trabajo de acuerdo con sus características específicas en términos de actividades de innovación y recursos. Dentro de este marco, recurriendo a técnicas de análisis de redes sociales, el presente estudio tiene como objetivo identificar las bases de las prácticas del *networking* en los clústeres textiles y de ahí obtener implicaciones en políticas y gestión. Los datos empíricos obtenidos en el clúster del textil valenciano indican la forma en la que el perfil y las características de las actividades de innovación de una empresa determinan las prácticas relacionales a nivel de empresa. Las empresas más innovadoras centradas en los textiles técnicos muestran unos niveles superiores de capacidades y recursos internos.

Palabras clave: Clúster industrial, industria textil, textiles técnicos, redes interorganizacionales, innovación.

Área o Eje Temático 7:

Economía y Empresa

Abstract

Empirical evidences profusely emphasize (reestructurar: "Substantial empirical evidence corroborates") the advantages that spatial colocation and networking engender for firm's (reestructurar: "brought about by spatial colocation and networking for firms") innovativeness in the textile industry. But, firms benefit from these advantages depending on their portfolio of relationships. Consequently, cluster firms build their networks according to their specific characteristics in terms of resources and innovation activities. Within this framework, using social network analysis techniques, this study aims to identify the foundations of networking practices in textile clusters and to derive managerial and policy implications. Empirical evidences ("evidence") obtained in the Valencian textile cluster point out ("indicate" o "show") how the profile and specificities of (insertar: "a") firm's innovation activities shape (insertar: "the") firm's level relational practices. Most innovative firms focused on technical textiles show higher levels of internal resources and capabilities.

Key Words: Industrial cluster, textile industry, technical textiles, inter-organizational networks, innovation

Thematic Area 7:

Economics and bussiness

1. INTRODUCCIÓN

La globalización ha propiciado una dispersión desigual y en continuo cambio de la innovación y las actividades de fabricación por todo el mundo, sin que la industria del textil y la confección haya sido una excepción (Puig y otros, 2009). La cadena de valor de la industria se ha globalizado y muchas de las empresas textiles se han visto inmersas en una compleja secuencia de actividades a través de una red de negocios dispersa por todo el mundo (Artschwager y otros, 2009). Sin embargo, este proceso no ha desdibujado la solidez de otro hecho fundamental de esta industria: la clusterización geográfica de actividades textiles (Dei Ottati, 2009; Dei Ottati, 2014; Crestanello y Tattara, 2011; Exposito-Langa y otros, 2015). Pese a que la globalización ha mermado parcialmente la competitividad de muchos clústeres textiles (Pla-Barber y Puig-Blanco, 2009), también ha conducido a una mayor innovación y flexibilidad a través de la colaboración de las empresas del clúster con actores internacionales de conocimiento intensivo. La correcta combinación del anclaje local y el dinamismo global pueden hacer que las empresas locales se desplacen hacia unas actividades textiles de mayor conocimiento intensivo (Puig y Marques, 2011).

Investigaciones previas han expuesto las bondades de la clusterización en cuanto al hecho de que la proximidad espacial favorece unos costes de transacción menores y potencia el acceso a una mano de obra especializada y, más en concreto, la difusión y el intercambio de conocimiento (Maskell y Malmberg, 1999). Diversos estudios empíricos aportan pruebas sobre los efectos positivos de la colocalización para la innovación (Audretsch y Feldman, 1996; Baptista y Swann, 1998; Beaudry y Breschi, 2003). Recurriendo a los datos cuantitativos recogidos en el clúster italiano de Prato, Signorini (1994) corroboró los efectos positivos de la clusterización de las empresas textiles en vistas a la productividad y el acceso privilegiado a los recursos. Pese a ser fructífero, este punto de vista ha sido cuestionado recientemente debido a que la proximidad espacial por sí misma no es una condición ni suficiente ni necesaria para la difusión del conocimiento. La explotación de la innovación potencial de un clúster depende en gran medida de la solidez de su red local (Giuliani, 2007).

En lugar de centrarse únicamente en los beneficios del clúster, sobrevalorados tradicionalmente y derivados del acceso automático a este conocimiento “que flota en el aire” gracias a la colocalización (Orsenigo, 2006), los estudiosos centran cada vez más su atención en las redes locales con el fin de explicar las trayectorias de innovación de las empresas y los clústeres. La idea subyacente en este enfoque alternativo indica que el conocimiento no está disponible de manera libre en la atmósfera del clúster, sino que más bien está incrustado en los actores del clúster que lo intercambian y cultivan a través de las relaciones o del capital social (Lorenzen, 2007). La metáfora de los clústeres como redes de organizaciones interdependientes conectadas unas con otras en procesos de creación de conocimiento sistémico permite un análisis más refinado del efecto de la colocalización en la innovación, hasta el punto que la innovación supone un proceso colaborativo

de varios actores en los que la generación, acumulación y difusión de conocimiento común son ingredientes cruciales (Asheim y otros, 2011).

Aunque este “pensamiento en red” ha ayudado a superar las limitaciones de trabajos empíricos prepublicados, la forma en que los clústeres influyen en la innovación todavía se está dilucidando. Mientras que existe determinado consenso en la idea de que las redes son un factor clave para la innovación de las empresas en los clústeres (Bathelt y otros, 2004; Giuliani, 2007; Belso-Martínez y otros, 2017; Exposito-Langa y otros, 2015, para la industria textil), las muestras empíricas sugieren que no todas las estructuras de redes potencian la innovación en la misma medida (Stam y Elfring, 2008).

La industria textil es un ejemplo paradigmático de cómo los efectos de una demanda estancada y una competición endurecida han forzado un intenso proceso de reestructuración y modernización a través de la asimilación de conocimiento nuevo. Particularmente en los países desarrollados, en la medida de sus capacidades, las empresas textiles han acentuado la incorporación de novedades técnicas con el fin de orientarse hacia nuevos nichos de mercado con un alto potencial para estrategias de conocimiento intensivo, como los textiles técnicos (Puig y otros, 2013). Siendo conscientes de la relevancia de las redes para la adquisición del conocimiento necesario para innovar, los fabricantes de textiles técnicos aparentan estar particularmente preocupados por la creación y gestión de su porfolio de relaciones (Danskin y otros, 2005).

Las empresas de la Unión Europea han ocupado una posición líder en diversos nichos técnicos, como los textiles no tejidos o compuestos, cuya producción alcanzó el 75 % y 60 % respectivamente desde 2000. En 2015, los textiles técnicos representaron un 30 % del total de la industria textil de la Unión Europea y un gran porcentaje de las exportaciones, con un aumento del 5,3%. Este excelente clima económico continuó durante 2016 cuando la producción de textiles no tejidos aumentó un 3 % y de otros tejidos técnicos un 4 %, según Euratex.

Muchas empresas textiles españolas también han reaccionado adoptando estrategias basadas en la tecnología y la reorientación hacia textiles técnicos (Costa y Duch, 2005). Hoy en día, el sector técnico está formado por unas 225 empresas y cuenta con el 16 % del total de la industria. En 2016, la producción de textiles técnicos en España creció un 4,9 %, poniéndose a la altura de los países líderes, como Francia, Alemania o Italia. Aproximadamente el 75 % de estas empresas están concentradas en la costa mediterránea, especialmente en Cataluña y la Comunidad Valenciana. Su responsabilidad en la resiliencia del sector facilita el análisis comparativo de este grupo de empresas de textiles técnicos (TTF) versus los fabricantes tradicionales o empresas de textiles no técnicos (NTTF), en cuanto al *networking* y otros aspectos relacionados con la innovación extremadamente atractivos para los académicos, profesionales y redactores de políticas.

Desafiado por las premisas anteriores y la falta de muestras inequívocas sobre los efectos de las redes en la innovación, el presente estudio elucida cómo la arquitectura relacional de una empresa afecta a la innovación en los clústeres del textil. Prestando atención a la magnitud del fenómeno del textil técnico en las recientes tendencias evolutivas de la industria, nuestro análisis comparativo entre las TTFs y las NTTFs contribuye a este paradigma emergente para: a) aclarar las diferencias y similitudes estructurales entre sus redes; b) desentrañar la manera en la que las configuraciones de dichas redes explican las disparidades en el

rendimiento de la innovación. Nuestros hallazgos no solo mejoran el estado académico de la bibliografía, sino que también proporcionan perspectivas para la gestión eficiente de redes locales a nivel de empresa y para un diseño más personalizado de políticas de innovación en los clústeres.

Utilizando los datos recogidos en el clúster del textil de Valencia y aplicando el análisis de redes sociales, nuestro estudio otorga un papel más importante a la naturaleza de las actividades de fabricación de la empresa a la hora de dar forma a las prácticas relacionales. En concreto, el actual clúster de TTFs marcó diferencias en términos de recursos internos y comportamiento del *networking*, que por su parte dan forma a posteriori al rendimiento de la innovación.

El presente documento ha sido estructurado en cuatro secciones. Tras la presente introducción, presentamos las bases teóricas y los temas de la investigación. A continuación, se describen los métodos y resultados. Y, por último, el debate, las conclusiones y las implicaciones cierran el estudio.

2. BIBLIOGRAFÍA Y TEMAS DE INVESTIGACIÓN

La globalización de la industria textil forzó rápidamente a los fabricantes de textiles a implementar estrategias para hacer frente a la creciente presión de minoristas y competidores. Algunos fabricantes tradicionales relocalizaron o externalizaron la producción hacia países con costes más bajos, mientras que otros optaron por el cambio a textiles de alto diseño para moda o se orientaron hacia la producción de textiles técnicos para la industria de la automoción, el sector de la construcción, ingeniería civil, medicina, salud y seguridad (Pickles y otros, 2006).

En lugar de magnitud y normalización, este nuevo segmento textil requiere esfuerzos adicionales en I+D y centrarse en la innovación tecnológica (Owen, 2000). La competitividad de una empresa, basada en los productos y tecnologías cuyos desarrollos recaen ambos en un conjunto de activos distintivos, se muestra en las habilidades y rutinas desarrolladas por las empresas con el paso del tiempo (Teece, 2010), así como en las dotaciones de alto nivel asociadas al clúster. Estos recursos del clúster emergen de la dotación de las rutinas y capacidades de las empresas en el territorio (Hervás-Oliver y Albors-Garrigós, 2007) y transforman el sistema industrial en un lugar con capacidades innovadoras superiores, en las que las empresas acceden con mayor facilidad a recursos compartidos permitiéndoles superar a sus competidores.

Más allá de las economías externas, los clústeres facilitan a las empresas colocalizadas acceso privilegiado a conocimiento específico que se refuerza sistemáticamente a través de la difusión de conocimiento y las prácticas de aprendizaje con las redes colaboradoras (Maskell y Malmberg, 1999; Tallman y otros, 2004). Algunos autores (Breschi y Lissoni, 2001; Boschma y Frenken, 2006; Morrison y Rabelotti, 2009) revelan la existencia de un cruce entre múltiples redes de los clústeres, por lo que se debe realizar una distinción entre ellas. En esta red de redes, un conocimiento técnico y otro conocimiento comercial son fácilmente identificables (Giuliani, 2007; Molina-Morales y otros, 2012; Balland y otros, 2016). La heterogeneidad de los miembros de la red, en términos de estrategias, capacidades y bases de conocimiento (Phelps y otros, 2012), estimula la creación de conocimiento local (Antonelli, 2005).

Aunque existe una pequeña duda sobre el papel de una red local de empresas

como fuente de conocimiento que influye de manera positiva en la innovación (Owen-Smith y Powell, 2004; Bell, 2005), no todas las redes funcionan igual hasta cierto punto. Dependiendo del perfil de la red, las empresas tienen diferente acceso tanto al conocimiento técnico como relacionado con los negocios (Giuliani y Bell, 2005; Balland y otros, 2016; Molina-Morales y otros, 2012; Boschma y Ter Wal, 2007; Belso-Martínez y otros, 2017). Por lo tanto, no todas las empresas del clúster disfrutaban de las mismas oportunidades para recuperar conocimiento (Biggiero y Sammarra, 2010; Todtling y otros, 2013). A pesar de compartir la misma localización, el conocimiento se intercambia de manera irregular y, en consecuencia, las empresas colocalizadas presentan rendimientos heterogéneos en innovación.

El estudio ha ahondado aún más en qué y cómo las características de las redes determinan la habilidad de una empresa para innovar. El tamaño de la red, definido como el número de relaciones con las que cuenta una empresa, supone un indicador de disponibilidad de fuentes de conocimiento (Powell y otros, 1996; Ahuja, 2000; Baum y otros, 2000). Las empresas con más socios se sitúan en una posición ventajosa, no solo por un número mayor de conocimiento accesible, sino también porque se reduce la dependencia de un número reducido de proveedores de conocimiento. Los estudios empíricos hacen hincapié en el efecto positivo del tamaño de la red para la innovación (Ahuja, 2000; Powell y otros, 1996).

Hasta cierto punto, la mera acumulación de socios puede no conducir a un mayor rendimiento de la innovación. Aumentar el número de socios en la red potencia la cantidad de conocimiento disponible a través de ella, pero también incrementa la posibilidad de conflictos y costes de coordinación (McFadyen y Cannella, 2004). Adicionalmente, redes mayores pueden convertirse en perjudiciales debido al coste y la dificultad de mantener múltiples relaciones (Rothaermel y Deeds, 2006). Algunas investigaciones previas (por ejemplo, Deeds y Demirkan, 2013) sugieren que contar con muy pocos miembros en la red de una empresa o que, en su lugar, sean demasiados pueden limitar la innovación y creación de conocimiento.

Además del tamaño de la red, la densidad o, sobre todo, la conectividad con la red de la empresa pueden también dar forma a la innovación. Una red densa, en la que los miembros estén altamente conectados entre ellos, da lugar a la reciprocidad, confianza y sanciones contra los comportamientos oportunistas, potenciando así el intercambio de conocimiento (Coleman, 1990; Rowley y otros, 2000), la evaluación de las capacidades de los socios (Eisingerich y otros, 2010) y el rendimiento (Ahuja, 2000). En concreto, esto es cierto en clústeres en los que la proximidad geográfica facilita las interacciones dominantes (Saxenian, 1994). No obstante, un exceso en la densidad puede limitar el acceso de los miembros de la red a conocimiento nuevo disponible más allá de la red. Sin nuevas ideas procedentes de fuera de la red, el conocimiento al que se accede a través de la red se convierte en homogéneo y redundante, obstaculizando la innovación. A costa de sacrificar los efectos positivos de la densidad, las redes dispersas proporcionan conocimiento más diverso y oportuno (Burt, 1992). Las conexiones directas limitadas entre socios reflejan operaciones circunscritas a distintas partes de la red total del clúster. A cambio, esto aumenta la posibilidad que estos socios aporten información heterogénea, proporcionando a la empresa principal ventajas informativas a través de las cuales es más factible desarrollar innovaciones (Burt, 2004).

Junto con el tamaño y la densidad, otros elementos estructurales, como las

características de la red a nivel de empresa, pueden mejorar la comprensión sobre el papel de los recursos relacionales. La naturaleza del conocimiento necesario para innovar cuenta con implicaciones sobre las relaciones que establecen las empresas (Asheim y Coenen, 2005; Plum y Hassink, 2011). Esto radica en el hecho de que para las empresas del clúster es necesario estar conectadas (Boschma y Ter Wal, 2007; Morrison y Rabelotti, 2009), pero puede no ser suficiente para beneficiarse de las interacciones puesto que necesitan un determinado nivel de similitud y complementariedad en términos de bases de conocimiento (Boschma y Frenken, 2009). Para transferencias de información valiosas, la base del conocimiento y la experiencia de los socios debería ser lo suficientemente cercana con el fin de comunicar y procesar conocimiento de manera satisfactoria. Si se dan demasiadas diferencias cognitivas entre dos partes unidas por el aprendizaje interorganizacional, la ausencia de un stock común de conocimiento y la diferente interpretación del contexto de negocio harían que no estuvieran disponibles para compartir y absorber conocimiento (Boschma, 2005).

Asheim y Coenen (2005) identificaron tres bases de conocimiento: sintética (basada en la ingeniería), analítica (basada en la ciencia) y simbólica (basada en lo artístico). En la misma industria pueden coexistir diferentes bases de conocimiento. En la actualidad, la industria textil refleja una ilustración empírica paradigmática de este fenómeno, ya que la base sintética de las NTTFs cohabita con la base analítica de las TTF (Asheim y otros, 2017). En este sentido, por ejemplo, podemos esperar que las empresas que muestran una base analítica donde la innovación viene de la mano de la ciencia sean más propensas a interactuar y compartir conocimiento.

Mientras la cercanía cognitiva en términos de base del conocimiento puede explicar la creación de vínculos (Cassi y otros, 2012) y el aprendizaje interactivo (Agrawal y otros, 2006) en los clústeres, puede que no siempre sea provechoso (Boschma y Frenken, 2009). Molina-Morales y otros (2015) muestran cómo un exceso de cercanía cognitiva puede dañar el *networking* en un clúster de alimentación español. Un solapamiento excesivo entre las bases de conocimiento puede reducir el aprendizaje y la innovación debido al riesgo de difusiones involuntarias de conocimiento, bloqueo cognitivo y la necesidad de dosis determinadas de disimilitud. Sammarra y Biggiero (2008) evidenciaron el efecto positivo de la heterogeneidad de las bases de conocimiento para la innovación colaborativa.

Cuando se intenta elucidar qué elementos dan explicación a la innovación de las empresas en los clústeres, junto con las características de la red, los estudiosos se muestran de acuerdo sobre el papel de las capacidades internas de una empresa construidas a través de las experiencias y esfuerzos de innovación acumulados (Cassiman y Veugelers, 2006). Los esfuerzos previos en innovación mejoran el stock de conocimiento de una empresa y la habilidad de adquirir y aplicar conocimiento externo de manera exitosa (Zahra y George, 2002). Cohen y Levinthal (1990) llamaron a esta habilidad “capacidad de absorción”, que permite reconocer el valor de información nueva y externa, asimilarla y aplicarla con fines comerciales.

En los clústeres, se ha probado que la capacidad de absorción es crucial para el rendimiento en materia de innovación (por ejemplo, Hervás-Oliver y Albers-Garrigós, 2009). Giuliani y Bell (2005) demostraron la forma en la que la capacidad

de absorción fomenta una apertura de la empresa al conocimiento externo. En su estudio sobre el clúster del calzado de Barletta, Boschma y Ter Wal (2007) encontraron una mayor relevancia de la capacidad de absorción en la adquisición de conocimiento técnico en detrimento del conocimiento comercial. De manera más actual, Expósito-Langa, Molina-Morales y Tomás-Miquel (2015) mostraron la importancia de los recursos relacionales y la capacidad de absorción para la innovación en los clústeres del textil. La red de clústeres representa una plataforma en la que las interacciones permiten la adquisición de conocimiento que de manera simultánea favorece las innovaciones y refuerza las capacidades de una empresa mediante el agrandamiento del stock de recursos y competencias (Powell y otros, 1996).

Especialmente para las empresas y clústeres del textil en la Unión Europea, en la que prevalecen las PYMEs sujetas a la responsabilidad de su tamaño reducido, las redes se han convertido en vitales para la implementación de estrategias basadas en la innovación. Por tanto, dando un paso adelante en su comprensión, es inevitable captar la resiliencia del clúster a través de actividades de conocimiento intensivo, como los textiles técnicos, cuyos resultados dependen de la combinación de las capacidades de las empresas y “cosas del clúster”.

Basados en el anterior estado de la literatura sobre clústeres, innovación e industria textil, surgen algunos temas clave que ayudan a configurar la dirección de nuestro análisis a través de las siguientes cuestiones. En primer lugar, los estudios tradicionales subrayan la relevancia de la localización del clúster debido a la presencia de externalidades. No obstante, las recientes contribuciones han establecido los cimientos para abordar las ventajas de la clusterización, a partir de la inserción en la red para acceder a los recursos locales. Proponemos que, en base a esta nueva visión, se puedan discernir de la información del clúster textil las claves de cómo las empresas textiles se integran en diferentes redes locales.

Un punto interesante a tener en cuenta es la ausencia evidente del análisis de las implicaciones de las características a nivel de empresa de las empresas textiles, como las investigaciones internas (capacidad de absorción) y la naturaleza de las actividades (estrechamente ligada a la base de conocimiento) en su comportamiento en el *networking*. Sobre todo, suponemos que la naturaleza de las actividades de fabricación, cuando se entienden como relativas a técnicas vs no técnicas, es importante con el fin de conseguir una imagen global de la difusión de conocimiento y la trayectoria innovadora, tanto del clúster como de sus miembros. Además, aún está pendiente de realizar una comparación más detallada entre los fabricantes implementando estrategias tradicionales frente a aquellas estrategias basadas en el conocimiento. Esperamos que ambos tipos de empresas puedan beneficiarse de nuestros hallazgos, particularmente con respecto a los modos de recogida, con el fin de diseñar eficientemente su porfolio de relaciones. Con ello, esta es el primer tema fundamental de la investigación:

RQ₁: ¿De qué manera las TTFs y NTTFs están implicadas en las redes de conocimiento técnico y comercial del clúster? ¿Hasta qué punto las TTFs y NTTFs difieren en la forma en la que están implicadas en la red de conocimiento técnico y comercial del clúster?

Existe un consenso sobre el efecto de las redes en la innovación, incluso en los clústeres textiles. No obstante, por lo que sabemos, todavía está pendiente realizar una aproximación a esta cuestión a través de la perspectiva de la dicotomía TTFs vs NTTFs. Este nuevo enfoque al papel de las diferentes estructuras de redes en la industria textil puede arrojar luz sobre el valor distintivo que la inmersión en las redes locales puede aportar a las industrias maduras de los países desarrollados. La segunda cuestión del estudio utilizada es:

RQ₂: *¿Cómo influye en el rendimiento de la innovación la participación de las TTFs y NTTFs en las redes del clúster? ¿Existe alguna diferencia entre los dos grupos de empresas?*

3. CONTEXTO Y METODOLOGÍA

3.1. EL CLÚSTER DEL TEXTIL DE VALENCIA

Según el Consejo Intertextil Español (CITYC), en 2015 la industria textil y de la confección supuso el 6 % del empleo en industria, el 3 % de la producción y el 7 % de las exportaciones industriales españolas. La producción aparece concentrada en determinadas zonas geográficas, como el clúster del textil de Valencia, donde multitud de PYMEs desarrollan diferentes actividades de una cadena de valor fragmentada. Este clúster, que incluye cuatro comarcas localizadas en el sudeste de la Península Ibérica (L'Alt Vinalopo, La Vall d'Albaida, El Comtat y L'Alcoia), se sitúa en tercera posición tras Barcelona y Madrid en la lista de aglomeraciones textiles de España. El clúster comprende numerosas empresas textiles que dan empleo a 22.695 trabajadores con un total de ingresos de 1.975 millones de euros, suponiendo el 19% de la industria española en 2016. Aunque sólidos vínculos inter-empresas y organizaciones de apoyo común, como el Campus de Alcoy de la Universitat Politècnica de València (UPV) y el Instituto Tecnológico Textil (AITEX), revelan la compacidad del área de producción al completo, las cuatro comarcas cuentan con una tradición bien arraigada en el textil "per se".

El clúster del textil supone un marco complejo en el que las empresas utilizan un amplio espectro de tecnologías y participan en múltiples cadenas de valor con el fin de dirigirse a diferentes mercados. El alcance de la actividad se extiende desde la preparación e hilado de fibras, pasando por el tejido y acabado del textil, hasta la producción de artículos tejidos o de punto o la elaboración de bordados. Durante décadas, predominaba la producción y comercialización de textiles domésticos, como mantas, edredones, tapizados o sábanas. Sin embargo, las presiones de reestructuración forzaron a muchas de estas empresas a externalizar procesos de trabajo intensivo o especializarse en la cadena de valor mediante el incremento de las actividades sobre las bases de conocimiento (Tomás-Miquel y otros, 2012).

Los textiles técnicos se han convertido en una de las prioridades para la industria textil española. Existen 280 empresas de textiles técnicos, que han generado 2.800 millones de euros en el pasado año y suponen el 20 % de las exportaciones. Según el AITEX, el 40 % aproximadamente de estas empresas están localizadas en el clúster del textil de Valencia. Este subgrupo de fabricantes es responsable de la resiliencia de un clúster que ha experimentado un aumento del 13 % en el volumen de negocio y sobre un 20% en las exportaciones en el periodo 2012-2016.

3.2. DATOS Y CUESTIONES SOBRE EL MUESTREO

Nuestro trabajo de campo en el clúster del textil de Valencia se llevó a cabo en dos fases durante la primera mitad de 2017. En la primera fase, se realizaron entrevistas a dos fabricantes clave y a un panel de expertos de instituciones locales (UPV, Asociación de Empresarios Textiles de la Comunidad Valenciana (ATEVAL), AITEX, etc.), lo que nos permitió obtener información sobre diversos aspectos de la industria y el clúster. La información adquirida se utilizó para diseñar un cuestionario provisional, recoger datos y debatir sobre los resultados finales. Una vez que se incluyeron determinadas modificaciones derivadas del pre-test aplicado a nuestras empresas y miembros del panel, la versión final de nuestro cuestionario estaba lista para ser utilizada.

La herramienta incluía diferentes preguntas sobre los procesos y rendimiento relacionados con la innovación a nivel de empresa. Para visualizar la actividad relacional del clúster, optamos por el conocido como método de listado (Wasserman y Faust, 1994). Las consideraciones metodológicas (Ter Wal y Boschma, 2009; Giuliani y Pietrobelli, 2016) y los estudios previos (Giuliani, 2007; Morrison y Rabbellotti, 2009; Ramírez-Pasillas, 2010; Balland y otros, 2016) hacen que esta estrategia sea altamente recomendable. Durante la entrevista, cada empresa se enfrentó a un listado completo de fabricantes y proveedores locales y se le pidió que especificara de cuáles había obtenido o a cuáles había transferido asesoramiento técnico o comercial. Los entrevistados también podían añadir nuevas empresas (competidores, clientes o proveedores) con las que hubieran tenido contacto y que no aparecieran en la lista. Los datos relacionales recogieron la existencia de vínculos basados en una percepción subjetiva y permitieron una reconstrucción fiable tanto de redes de conocimiento técnico como comercial¹.

Empezamos la segunda fase del campo de trabajo determinando la demografía de las empresas en el clúster a través del directorio de empresas españolas y portuguesas SABI². Esta base de datos también nos facilitó información detallada, como la ubicación de las empresas, actividades principales, ganancias, rendimiento financiero y número de empleados. Gracias a un amplio rango de procesos de fabricación, se identificaron unas 300 empresas. Teniendo en cuenta el objetivo final de nuestro estudio y siguiendo las indicaciones de nuestro panel de expertos, desechamos las microempresas y los meros comercializadores de textiles de hogar, que no cuentan con actividades de innovación en gran medida y no participan de manera significativa en el furor del conocimiento local. Tras realizar este ajuste, la lista final se redujo a 125 empresas. A pesar de que las microempresas se quedaron sin representación en la muestra, la clasificación de las empresas por tipos de tamaños no difiere significativamente de la distribución por tamaño en la demografía de las empresas del clúster.

¹ Las 4 preguntas en cuestión son las siguientes: a) ¿A cuál de las empresas de la lista le ha solicitado de manera regular información técnica durante los últimos tres años?, b) ¿A cuál de las empresas de la lista le ha solicitado de manera regular información comercial durante los últimos tres años?, c) ¿De cuál de las empresas de la lista ha recibido de manera regular solicitud de información técnica durante los últimos tres años?, d) ¿De cuál de las empresas de la lista ha recibido de manera regular solicitud de información comercial durante los últimos tres años?.

² SABI es un directorio de empresas españolas y portuguesas que recoge información general y datos financieros. En el caso de España, cubre más del 95 % de las empresas de 17 comunidades españolas.

Los directivos y empresarios de 107 empresas del listado final respondieron al cuestionario realizado por un técnico especializado que se realizó durante 40-50 minutos en una entrevista personal. En nuestra opinión, el perfil del entrevistador contribuyó decisivamente a la solidez y credibilidad del campo de trabajo. El índice de respuestas representa al 86% del total de empresas que forman el clúster. Nuestro panel de expertos confirmó que todas las empresas relevantes habían participado y que las empresas entrevistadas representaban a la red del clúster, así como prácticamente todos sus diferentes flujos de conocimiento. Los datos relacionales se dispusieron en dos matrices correspondientes a las redes de conocimiento técnico y comercial respectivamente. En cada matriz de datos de 107 por 107, la celda ij se codificaba "1" cuando cualquiera de los entrevistados de la empresa i informaba de una unión de conocimiento con la empresa j .

Se completó la segunda fase por medio de entrevistas semiestructuradas con los directivos y ejecutivos de las empresas. Dichas entrevistas nos permitieron adquirir un entendimiento detallado de las mismas y pudimos clasificarlas con cuidado en dos grupos, TTFs y NTTFs. Concretamente, se les pidió a las empresas que corroboraran nuestra agrupación inicial basada en un criterio cuantitativo (producción media de textiles técnicos por encima del 30% durante los últimos 3 años). Como resultado, tras completar esta tarea final, se obtuvo un total de 46 TTFs y 61 NTTFs.

3.3. VARIABLES

Innovación

Esta variable cuantifica la capacidad de una empresa de mejorar progresivamente los procesos en los productos y servicios existentes mediante la adaptación de la escala de Jansen y otros (2006) a las características particulares de nuestro estudio. Optamos por una innovación gradual como medida de innovación general de las empresas del clúster puesto que este tipo de innovación es la más representativa en los contextos del clúster en industrias de baja y mediana tecnología donde prevalecen las PYMEs (Forsman y Annala, 2011).

Más en detalle, se les pidió a las empresas que, utilizando una escala Likert de 7 puntos, puntuaran las 7 preguntas sobre la mejora del rango existente de productos y servicios, la implementación regular de ligeras adaptaciones a productos y servicios existentes, la introducción de productos y servicios mejorados en el mercado local, el aumento de la eficiencia en los procesos de suministro, el aumento de las economías de escala en los mercados existentes, la provisión de servicios a los clientes existentes y la relevancia de la reducción de costes internos. Se utilizó un factor de análisis con rotación varimax para condensar la información obtenida de estos 7 puntos en un único índice de innovación. Los valores de medición de adecuación del test KMO y del Alpha de Cronbach fueron 0,906 y 0,910 respectivamente.

Variables de las redes: conectividad, densidad y homofilia

A partir de las dos matrices de datos, calculamos la red de cada empresa a través de técnicas de análisis de redes sociales que constituyen una poderosa herramienta con el objetivo de explorar las propiedades estructurales de una red (Wasserman y Faust, 1994). La red de una empresa supone una parte de la red global del clúster y está formada por la empresa y sus relaciones con otras empresas del clúster. Desde una perspectiva analítica, adoptamos este enfoque de

red-empresa con el fin de calcular las diferentes variables puesto que se centra en el patrón de vínculos entorno a la empresa y sus características, como el tamaño o la densidad.

Dos variables recogen la conectividad de la empresa con las redes de conocimiento técnico y comercial respectivamente. Tras la estela de estudios previos (Boschma y Ter Wal, 2007; Belso-Martinez y Diez-Vial, 2017; Demirkan y otros, 2012), calculamos la conectividad a la red técnica por medio del tamaño de la red de conocimiento técnico de la empresa. En el mismo sentido, también estimamos la conectividad a la red comercial por medio del tamaño de la red de conocimiento comercial de la empresa. En ambos casos, el tamaño de cada red representa el número absoluto de empresas que están directamente relacionadas con la empresa en cuestión. Cuanto más grande sea el tamaño de la red técnica y comercial de una empresa, mayor será la conectividad a dichas redes.

La densidad de la red de una empresa refleja otro aspecto de su estructura relacional inmediata y supone una medición común de la estructura de la red (Marsden, 1990; McFadyen y otros, 2009). El índice hace referencia a la proporción de todas las conexiones posibles en la red de cada empresa que están presentes en realidad. De este modo, calculamos la densidad de la red de conocimiento comercial y técnico de cada empresa. El razonamiento subyacente en estas dos variables muestra que cuanto mayor sea el porcentaje de socios de la empresa relacionados unos con otros, mayor será la densidad de la red de la empresa.

Las publicaciones sobre clústeres resaltan el argumento de la homofilia (la similitud genera conexiones) (Mcpherson y otros, 2001), como un poderoso conductor de la formación de redes. Decidimos examinar el papel de la homofilia recurriendo al principio de similitud en cuanto al producto principal de la empresa, que está estrechamente conectado a la base del conocimiento de la misma, puesto que es más fácil que las empresas del clúster se asocien entre ellas mismas que con otras similares a través de esta dimensión (Balland, 2012; Broekel y Boschma, 2012; Rosenkopf y Padula, 2008). Con este fin, tanto en las redes comerciales como en las técnicas, identificamos la intensidad con la que una TTFs prefiere relacionarse con otras TTFs, así como la intensidad de una NTTF para conectarse con otras NTTFs. Los dos coeficientes de intensidad para cada empresa se obtuvieron dividiendo el número de socios con productos similares por el número total de socios en las redes comerciales y técnicas de la empresa.

Capacidad de absorción

Siguiendo a Cohen y Levinthal (1990), muchos estudiosos han recurrido a medidas y enfoques relacionados con I+D para indicar la capacidad de absorción a nivel de empresa (Schmidt, 2010). Por tanto, operativizamos la capacidad de absorción mediante 5 elementos que reflejan la implicación de una empresa en actividades de I+D. En la línea de Jansen, Van den Bosch y Volberda (2005), se requirió a los encuestados que evaluaran: a) el compromiso e inquietudes de los directivos de la empresa en cuanto a I+D; y b) la importancia de la cooperación para la adquisición de conocimiento. Además, se les preguntó a los entrevistados si su empresa había adoptado programas de I+D en los últimos tres años, el número de empleados cualificados técnicamente y los gastos en I+D sobre las ventas totales (como esfuerzos en innovación). Con el fin de combinar la información de los 5 elementos en una única variable, se llevó a cabo un análisis factorial con rotación varimax. Se obtuvo un Alpha de Cronbach de 0,901 y un valor de

medición de adecuación del test KMO de 0,647.

Variables de Control

Por último, nuestro modelo se completó con la inclusión de dos variables de control, la antigüedad y el tamaño de la empresa. Por un lado, el tamaño se midió a través del número total de empleados para evitar una alta correlación entre la intensidad de I+D y los beneficios. La asociación entre el tamaño y la innovación ha sido señalada frecuentemente en la bibliografía (Audretsch y Acs, 1991). Por otro lado, la antigüedad de la empresa se calculó a partir del número de años desde su fundación, puesto que la evolución temporal influye en el rendimiento de los clústeres (Pouder y St. John, 1996). Excepto por las estadísticas descriptivas, la transformación logarítmica se aplicó a ambas variables con anterioridad al análisis formal.

3.4. TÉCNICAS Y RESULTADOS DE ANÁLISIS

Junto con las estadísticas descriptivas y los análisis de redes sociales, se llevaron a cabo tests paramétricos (test ANOVA y prueba T para muestras independientes) con el fin de realizar comparaciones intergrupales. Con anterioridad, confirmamos que los datos se distribuyeron de forma normal (test de Shapiro-Wilk con P-valor $>0,05$), que había una homogeneidad de varianza (prueba de Levene con P-valor $> 0,05$) y que no se daban valores atípicos (mediante la inspección del diagrama de caja *-boxplot-*).

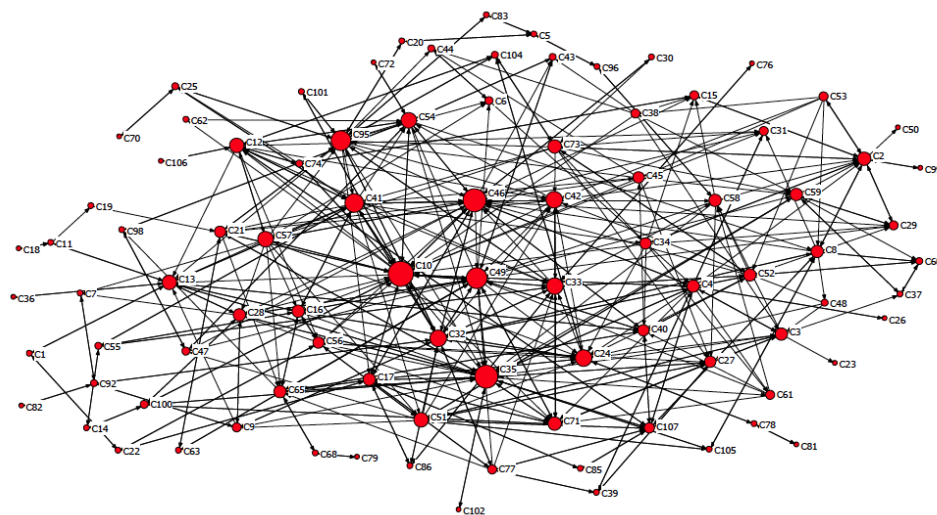


Figura 1. Red de conocimiento comercial del clúster del textil.

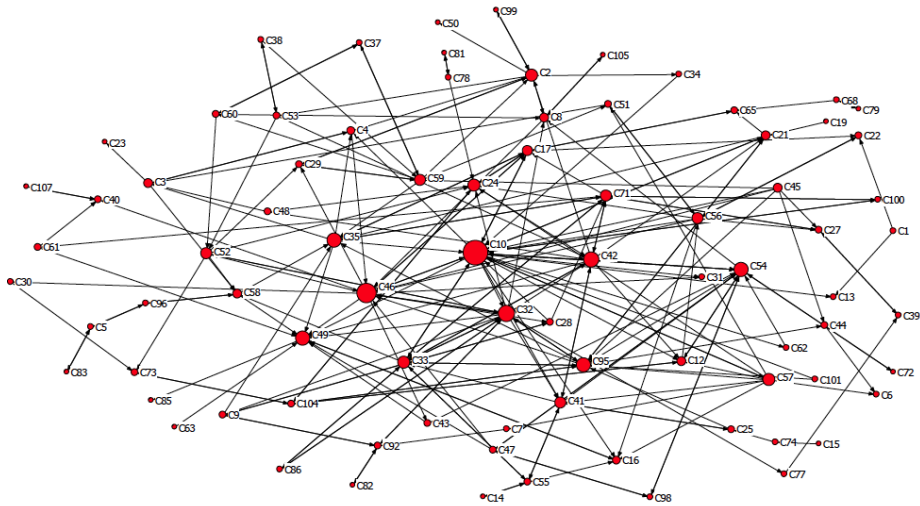


Figura 2. Red de conocimiento técnico del clúster del textil.

Las Figuras 1 y 2 muestran las redes de conocimiento técnico y comercial en términos de sus relaciones y estructura de conectividad. Los puntos rojos representan a las empresas y el tamaño de los mismos es proporcional al número de relaciones directas que posee la empresa actualmente. Cuanto mayor sea la cantidad de vínculos directos, mayor será el tamaño del círculo. Las líneas indican la existencia de relaciones entre las empresas. En nuestro caso, estas líneas nos proporcionan una idea de la dirección en la cual fluye el conocimiento que se está intercambiando y dicha dirección se indica mediante una flecha.

A simple vista, las diferencias entre las dos redes resultan evidentes. La densidad, definida como la proporción de las relaciones existentes en la red total del clúster en cuanto a las relaciones probables, es mayor en la red comercial. Esto muestra una accesibilidad aumentada y la difusión del conocimiento comercial a nivel del clúster. Por el contrario, una estructura más esparcida de la red técnica sugiere una distribución más selectiva de este conocimiento. Tanto en la red comercial como en la técnica, existen diferencias notables en el tamaño de los círculos, reflejando asimetrías importantes en el acceso al conocimiento.

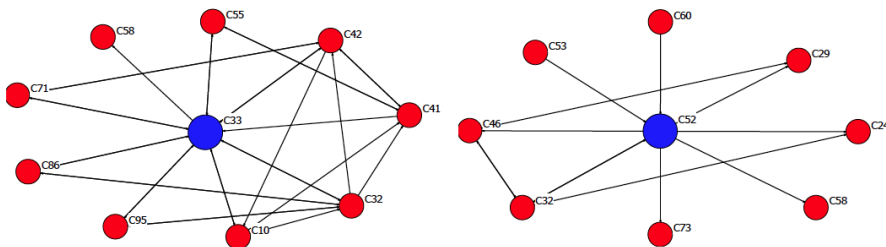


Figura 3. Comparación de una red media de una NTTF y una TTF respectivamente.

Las dos redes del clúster ponen en común la red particular de cada empresa. Cada empresa en el clúster posee su propia red técnica y comercial que es parte de una arquitectura relacional global del mismo. La Figura 3 muestra un ejemplo de la estructura representativa de la red individual de una TTF y una NTTF. El círculo azul es la empresa principal y los círculos rojos son los socios de la misma. La red técnica y comercial individual de cada empresa muestreada ha sido utilizada para calcular las variables de redes aplicadas anteriormente.

De acuerdo con el análisis estadístico descriptivo de la Tabla 1, los valores de conectividad confirman que las NTTFs y las TTFs están altamente implicadas en la red comercial y técnica del clúster, con un tamaño medio de la red de la empresa de entre 3.440 y 5.930. Ambos tipos de empresas están más conectadas de media a la red comercial del clúster, mientras que la densidad media de las NTTFs es siempre mayor que las TTFs. Los valores homófilos se sitúan entre el 60 y 70 % en ambas redes, aparentemente mostrando un efecto de atracción por similitud. Los dos grupos tienen una media de 40-50 empleados y 33 años de antigüedad, lo que sugiere que muchas de las NTTFs se transformaron en TTFs. Como se esperaba, las TTFs muestran unos valores medios más altos en términos de innovación y capacidad de absorción.

Tabla 1. Estadísticas descriptivas de las variables

	NTTF		TTF	
	Media	Desv. Est.	Media	Desv. Est.
VARIABLES DE RED				
Conectividad (red comercial)	5.930	5.935	5.87	6.181
Conectividad (red técnica)	3.440	3.823	3.480	4.401
Densidad (red comercial)	0,190	0,278	0,091	0,103
Densidad (red técnica)	0,225	0,351	0,064	0,158
Homofilia (red comercial)	0,710	0,297	0,640	0,283
Homofilia (red técnica)	0,616	0,285	0,635	0,338
OTRAS VARIABLES				
Innovación	- 0,036	0,987	0,775	0,884
Capacidad de absorción	- 0,410	1.004	0,350	1.372
Tamaño	41.440	50.196	48.28	68.028
Antigüedad	32.930	18.967	32.98	16.882

Con el fin de estudiar las diferencias entre las NTTFs y las TTFs en el *networking* técnico y comercial, se aplicó la prueba T de Student utilizando las variables en la Tabla 1. La prueba T para muestras independientes evalúa la hipótesis de si la diferencia entre las muestras de NTTF y TTF es igual a 0 (esta hipótesis se llama, pues, hipótesis nula). Cuando el P-valor es menor de 0,10, la hipótesis nula queda rechazada y la conclusión muestra que los dos medios diferirán, de hecho, significativamente. Los valores positivos (negativos) de T implican que los valores medios de las NTTFs son mayores (menores) que los valores medios de las TTFs.

Los resultados resumidos en la Tabla 2 indican que las empresas del clúster no muestran diferencias significativas en su conectividad y homofilia, tanto en la red comercial como en la técnica. En otras palabras, las TTFs y las NTTFs presentan un tamaño de red análogo y parecen seguir la misma lógica de asociación, como la dimensión del producto. En este sentido, es más probable que las NTTFs establezcan lazos de conocimiento y negocio con otras NTTFs, y al revés. No obstante, las redes de las empresas difieren significativamente en términos de densidad. Las redes de las NTTFs son más densas que las de las TTFs, tanto para la red técnica como para la comercial.

Tabla 2. Estadísticas de la prueba T de Student

Variable	T	Sig.
<hr/>		
Variables de la red		
<hr/>		
Conectividad (red comercial)	0,055	0,956
Conectividad (red técnica)	-0,292	0,771
Densidad (red comercial)	2.303	0,023**
Densidad (red técnica)	2.896	0,005** *
Homofilia (red comercial)	0,622	0,536
Homofilia (red técnica)	1.186	0,239
<hr/>		
Otras variables		
<hr/>		

Innovación	-4.400	0,000** *
Capacidad de absorción	-3.310	0,001** *
Tamaño (log.)	-0,108	0,915
Antigüedad (log.)	-0,152	0,879

Significativo en 0,1 (*); nivel 0,05 (**); nivel 0,01 (***)

Adicionalmente, los resultados también revelan la existencia de diferencias significativas entre NTTFs y TTFs en la capacidad de absorción y el rendimiento de la innovación. En ambas variables, las TTFs muestran valores más altos que aquellos de las NTTFs; es decir, las TTFs presentan rendimientos de innovación mayores, así como mejores capacidades de identificación, adquisición y procesamiento de conocimiento. Por último, los resultados recogen que las TTFs y las NTTFs no difieren significativamente en cuanto al tamaño o la antigüedad entre ellas.

Una vez que se identificaron las principales diferencias entre NTTFs y TTFs, estudiamos hasta qué punto la implicación de las TTFs y las NTTFs en estas redes influye en la innovación de la empresa. Para ello, analizamos la relación entre la estructura de la red de las empresas (conectividad y densidad) y su rendimiento en innovación, de forma separada para las NTTFs y las TTFs, y posteriormente contrastamos los resultados. Para proceder, inicialmente clasificamos las empresas en las redes técnicas y comerciales según los valores de nuestras variables de redes (conectividad y densidad). Los tertiles dividieron nuestros datos en tres partes iguales. A partir de esta división, se realizó un primer grupo (G1) con empresas con valores bajos de la variable (tertil inferior). El segundo grupo (G2) contenía empresas con valores intermedios (tertil central), mientras que las empresas en el tertil superior se reunieron en un tercer grupo (G3).

Una vez se clasificaron las empresas en tres grupos para nuestras dos redes según su nivel relacional, se aplicó una prueba ANOVA unidireccional con el fin de evaluar las diferencias entre el rendimiento en innovación de los tres grupos por separado para NTTFs y TTFs, así como para ambas redes de conocimiento, técnico y comercial. En este caso, el diseño del experimento para ambas redes contaría con cuatro variables independientes o factores explicativos (conectividad alta, media o baja y densidad alta, media o baja, tanto en la red técnica como en la comercial), mientras que el rendimiento en innovación de la empresa se interpretaría como la variable dependiente.

Tabla 3. Estadísticas de las pruebas ANOVA

	Red	Empr.	Media G1	Media G2	Media G3	F	Sig.
Efecto de la conectividad en innovación	Red comercial	NTTF	-0,309	0,017	0,274	1.987	0,146
		TTF	0,362	0,887	1.106	2.076	0,137
	Red técnica	NTTF	-0,479	0,224	0,276	4.446	0,016**
		TTF	0,201	0,825	1.530	9.396	0,000***
Efecto de la densidad en innovación	Red comercial	NTTF	-0,212	0,022	0,156	0,748	0,478
		TTF	0,575	0,600	1.119	1.944	0,155
	Red técnica	NTTF	-0,473	0,377	0,179	4.889	0,011**
		TTF	0,103	1.058	1.097	7.496	0,002***

Significativo en 0,1 (*); nivel 0,05 (**); nivel 0,01 (***)

A tenor de la Tabla 3, solo encontramos diferencias significativas en el rendimiento medio en innovación entre los diferentes grupos en el caso de la red de conocimiento técnico, tanto para las NTTFs como las TTFs, y para ambas variables, conectividad y densidad. Con el objetivo de evaluar dónde se encontraban las diferencias entre los tres grupos de NTTFs y TTFs, llevamos a cabo un análisis post hoc de Tukey a través de la comparación por pares. En vistas al efecto de la conectividad en la innovación, los resultados de la Tabla 4 muestran que, para las NTTFs, la media de rendimiento en innovación del grupo de empresas con menor conectividad (G1) es inferior y significativamente diferente a los otros (G2 y G3). Así, el primero grupo formaría un grupo homogéneo. Por otro lado, las medias del rendimiento en innovación de las empresas en los grupos G2 y G3 son mayores y no muestran diferencias estadísticamente significativas entre ellos. Por tanto, podemos concluir que el G1 muestra una conectividad e innovación menor en comparación con el G2 y G3.

Tabla 4. Estadísticas para las pruebas post hoc de Tukey (comparaciones por pares)

	Empr. G1-G2			G1-G3			G2-G3			
	Dif.	Error est.	Sig.	Dif.	Error est.	Sig.	Dif.	Error est.	Sig.	
Efecto de la Red conectividad en innovación	NTTF	-0,703	0,29	0,049*	-	0,287	0,029*	-	0,30	0,984
		1		*	0,754		*	0,05	7	
								2		
	TTF	-0,624	0,25	0,048*	-	0,308	0,000*	-	0,29	0,049
		5		*	1.329		**	0,70	0	**
								5		
Efecto de la Red densidad en innovación	NTTF	-0,850	0,29	0,016*	-	0,279	0,058*	0,19	0,31	0,800
		7		*	0,651			9	1	
	TTF	-0,955	0,26	0,002*	-	0,333	0,013*	-	0,30	0,991
		4		**	0,994		*	0,03	6	
								9		

Significativo en 0,1 (*); nivel 0,05 (**); nivel 0,01 (***)

De manera complementaria y en relación con las TTFs, los resultados indican que la media de rendimiento en innovación del grupo de empresas con mayor conectividad (G3) es superior y significativamente diferente de los otros grupos (G1 y G2). Así, este tercer grupo formaría un grupo homogéneo. Además, la media del rendimiento en innovación de las empresas del segundo grupo es superior y significativamente diferente a la del primer grupo. De ese modo, G1 y G2 supondrían también otros dos grupos homogéneos. Por tanto, para las TTFs, podemos concluir que la conectividad mejora sistemáticamente la innovación.

Por otro lado, con respecto al efecto de la densidad en la innovación, para las NTTFs y las TTFs, el rendimiento en innovación de las empresas con densidad menor (G1) es inferior y significativamente diferente a los otros (G2 y G3). Además, los grupos G2 y G3 de empresas no muestran diferencias estadísticamente importantes entre ellas en cuanto a rendimiento en innovación.

Con el fin de clarificar estos resultados, incluimos diagramas de barras por grupos, tanto para el efecto de la conectividad en la innovación en NTTFs (Figura 1) y TTFs (Figura 2), como el efecto de la densidad en innovación en NTTFs (Figura 3) y TTFs (Figura 4) en la red de conocimiento técnico.

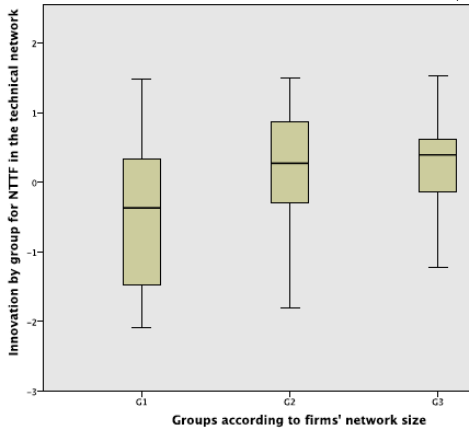


Figura 1. Diagrama de barras por grupos para conectividad variable en NTTFs.

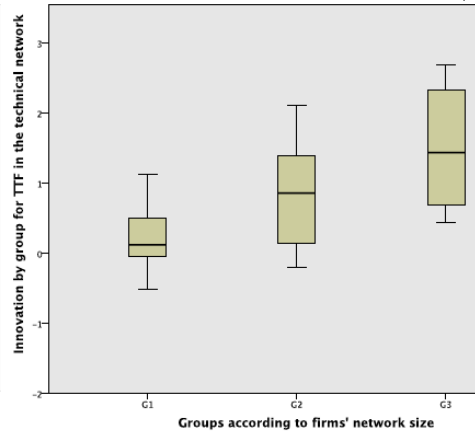


Figura 2. Diagrama de barras por grupos para conectividad variable en TTFs.

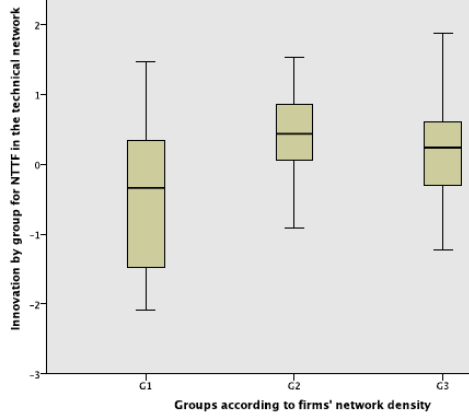


Figura 3. Diagrama de barras por grupos para densidad variable en NTTFs.

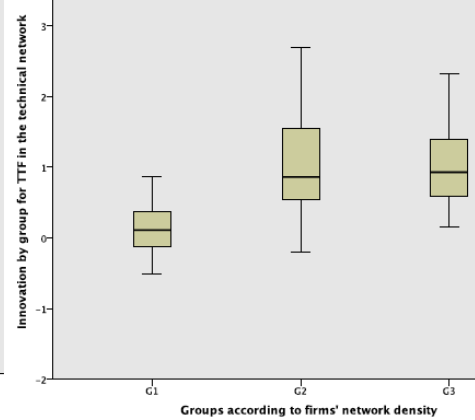


Figura 4. Diagrama de barras por grupos para densidad variable en TTFs.

4. DEBATE, CONCLUSIONES E IMPLICACIONES

Existe cada vez una comprensión mayor acerca de que el conocimiento se intercambia de manera selectiva y desigual entre las empresas a través de las redes de los clústeres. La innovación en una empresa puede atribuirse a su particular inserción en estas redes del clúster, junto con su capacidad de absorción que le permite la explotación del conocimiento adquirido. Dado el hecho de que no todas las empresas del clúster se encuentran inmersas o posicionadas de igual manera en las redes, este estudio aporta una contribución significativa sobre el tipo de inclusión que es necesaria con el fin de innovar en la industria textil. La respuesta a dos preguntas abiertas relevantes a través de datos a nivel de empresa recogidos en el clúster del textil de Valencia supone un paso más allá, puesto que muchos análisis previos carecían de visiones de dentro de la estructura de las redes de las que proceden los beneficios para la innovación.

Nuestra primera pregunta abierta sobre la implicación de las TTFs y NTTFs en la red de conocimiento técnico y comercial arroja luz sobre las singularidades del *networking* de un fenómeno basado en el conocimiento en la industria textil. Con el fin de ahondar en estas peculiaridades, utilizamos tres indicadores estructurales de la red de la empresa (tamaño, densidad y homofilia). Mientras que ambos grupos muestran una conectividad análoga y preferencia por socios similares, descubrimos que las redes de las NTTFs son más densas que las de las TTFs. Los fabricantes tradicionales de textiles mantienen prácticas relacionales generalizadas en clústeres maduros caracterizados por la reciprocidad, transferencias de conocimiento detallado, prácticas de aprendizaje común y una atmósfera de confianza. Fomentando la densidad, la estructura resultante de la red potencia la adquisición de conocimiento local que suele materializarse en pequeñas mejoras del rango del producto existente. Por el contrario, las TTFs están más preocupadas por conectar con fuentes capaces de producir o transferir conocimiento nuevo que pueda generar productos o procesos con características de rendimiento no precedentes.

La ausencia de diferencias en términos de homofilia y conectividad también proporcionan un resultado interesante. Por un lado, las NTTFs o las TTFs tienden a estar conectadas con empresas similares a ellas en lugar de con otras diferentes. Obviamente, esto muestra que cada tipo de empresa cuenta con su propia percepción, entendimiento y evaluación del contexto de negocios del textil. Esta similitud entre socios facilita la adquisición de conocimiento, pero también su asimilación y aplicación a través de la capacidad de absorción de la empresa. Desde la perspectiva global del clúster, es posible que este proceso tenga como resultado dos “clubes de conocimiento” y mayores dificultades para acceder a fuentes alternativas de conocimiento que permitan la diversificación de estrategias o innovación. Por otro lado, el número de socios en la red no es significativo. Junto con nuestros hallazgos previos, esto revela que la pregunta es con quién en lugar de hasta qué punto las empresas están conectadas. Una vez más, los directivos deberían seleccionar cuidadosamente a sus socios y minimizar las relaciones que les generen un valor bajo.

Cuando nos centramos en el rendimiento en innovación, aparecen resultados más destacables. Al contrario de la inclusión en la red comercial, formar parte de la red técnica parece crucial para comprender la innovación de una empresa. Sin lugar a dudas, está estrechamente conectada a la operacionalización del rendimiento en

innovación que principalmente se basa en la innovación del producto y relega otras dimensiones organizativas o de comercialización. El hecho de examinar de cerca la red técnica corrobora nuestras expectativas de que no todas las estructuras de las redes del clúster potencian la innovación hasta el mismo punto. De hecho, nuestro análisis revela diferencias importantes de densidad y conectividad dependiendo del tipo de empresas que se tengan en cuenta. La conectividad es crucial tanto para las TTFs y como para las NTTFs. No obstante, mientras que tener una gran cantidad de fuentes de conocimiento parece siempre positivo para las TTFs, los beneficios de una mayor conectividad para las NTTFs se obtienen hasta cierto punto tras el cual se desvanecen prácticamente. Posiblemente, los niveles superiores de recursos internos de las TTFs (capacidad de absorción) les permiten, de manera exitosa, gestionar, internalizar y obtener ventajas de grandes redes de conocimiento técnico.

La influencia de la densidad en la innovación también difiere entre las NTTFs y las TTFs. Hablando en términos generales, las frecuentes interacciones y las transferencias de conocimiento detallado, que dan lugar a densas redes, suavizan la absorción de conocimiento y promueven el rendimiento en innovación. Sin embargo, a la luz de nuestros hallazgos, parece existir un “efecto umbral” para ambos tipos de empresas. Aparece un nivel crítico de densidad. Una vez las empresas sobrepasan este umbral, un mayor incremento en la densidad no produce efectos significativos en la innovación. En el caso de las NTTFs, un exceso de densidad incluso resulta perjudicial para el rendimiento de la innovación.

Nuestro análisis cuenta con importantes implicaciones de gestión. Potenciando el entendimiento de cómo y por qué las redes juegan un papel en las transferencias e innovación de conocimiento, nuestras percepciones pueden ayudar a tomar una decisión estratégica en la gestión del portafolio de relaciones de la empresa. Y lo que es más importante, nuestros hallazgos remarcan la importancia de la estructura de la red. También muestran lo crucial que suponen para el diseño y la determinación del grado de conectividad y densidad a la luz de las características y estrategia de innovación de la empresa. Por ejemplo, en los casos en los que el objetivo es desarrollar productos basados en el conocimiento, como los textiles técnicos, nuestros descubrimientos apuntan al hecho de que es de vital importancia configurar redes de fuentes de conocimiento diverso y múltiple. Dicha complejidad solo puede capitalizarse si se obtiene una capacidad de absorción sólida. En la otra cara de la moneda, los fabricantes tradicionales deberían tener cuidado puesto que sus débiles bases de conocimiento les invitan a mantener estrategias relacionales que conllevan configuraciones de redes arriesgadas.

El presente trabajo no está exento de limitaciones, sino que a su vez abre caminos para futuras investigaciones. Nuestros datos son transversales y están circunscritos a una determinada localización geográfica. Aunque tenemos algunas dudas sobre su robustez y validez, un enfoque longitudinal y multiclúster aumentaría la generalización de nuestros hallazgos. Además, diferentes operacionalizaciones de innovación (por ejemplo, innovación radical) pueden complementar nuestra investigación. Mientras que hemos sugerido las implicaciones de la homofilia en la creación de “clubes de conocimiento”, los investigadores deberían prestar particular atención a las ventajas potenciales de las posiciones de la red de empresas que conectan dichos clubes.

REFERENCIAS

- AGRAWAL, A., COCKBURN, I. & MCHALE, J., (2006). Gone but not forgotten: Knowledge flows, labor mobility, and enduring social relationships. *Journal of Economic Geography*, 6, pp.571–591.
- AHUJA, G., (2000). Collaboration networks, structural holes, and innovation: A longitudinal study. *Administrative Science Quarterly*, 45(3), pp.425–455.
- ANTONELLI, C., (2005). Models of knowledge and systems of governance. *Journal of Institutional Economics*, 1(1), pp.51–73.
- ARTSCHWAGER, A. Y OTROS, (2009). New quality of partnership in the textile world-concepts and technologies. In *Transforming Clothing Production into a Demand-driven, Knowledge-based, High-tech Industry: The Leapfrog Paradigm*. pp. 141–200.
- ASHEIM, B., GRILLITSCH, M. & TRIPPL, M., (2017). Chapter 4 – Smart Specialization as an Innovation-Driven Strategy for Economic Diversification: Examples From Scandinavian Regions. *Advances in the Theory and Practice of Smart Specialization*, (August), pp.73–97.
- ASHEIM, B.T. & COENEN, L., (2005). Knowledge bases and regional innovation systems: Comparing Nordic clusters. *Research Policy*, 34, pp.1173–1190.
- ASHEIM, B.T., SMITH, H.L. & OUGHTON, C., (2011). Regional Innovation Systems: Theory, Empirics and Policy. *Regional Studies*, 45(7), pp.875–891.
- AUDRETSCH, D.B. & ACS, Z.J., (1991). Innovation and Size at the Firm Level. *Southern Economic Journal*, 57(3), p.739–744 CR–Copyright © 1991 Southern Econo.
- AUDRETSCH, D.B. & FELDMAN, M.P., (1996). R&D Spillovers and the Geography of Innovation and Production. *American Economic Review*, 86(3), pp.630–640.
- BALLAND, P.-A., (2012). Proximity and the Evolution of Collaboration Networks: Evidence from Research and Development Projects within the Global Navigation Satellite System (GNSS) Industry. *Regional Studies*, 46, pp.741–756.
- BALLAND, P.-A., BELSO-MARTÍNEZ, J.A. & MORRISON, A., (2016). The dynamics of technical and business knowledge networks in industrial clusters: Embeddedness, status, or proximity? *Economic Geography*, 92(1).
- BAPTISTA, R. & SWANN, P., (1998). Do firms in clusters innovate more? *Research Policy*, 27(5), pp.525–540.
- BATHELT, H., MALMBERG, A. & MASKELL, P., (2004). Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography*, 28(1), pp.31–56.
- BAUM, J.A.C., CALABRESE, T. & SILVERMAN, B.S., (2000). Don't go it alone: alliance network composition and startups' performance in Canadian biotechnology. *Strategic Management Journal*, 21(3), pp.267–294.
- BEAUDRY, C. & BRESCHI, S., (2003). Are firms in clusters really more innovative? *Economics of Innovation and New Technology*, 12(4), pp.325–342.
- BELL, G.G., (2005). Clusters, networks, and firm innovativeness. *Strategic Management Journal*, 295(September 2004), pp.287–295.
- BELSO-MARTINEZ, J.A. & DIEZ-VIAL, I., (2017). Firm's strategic choices and network knowledge dynamics: how do they affect innovation? E. CARAYANNIS & P. Heisig, eds. *Journal of Knowledge Management*, pp.00–00.
- BELSO-MARTÍNEZ, J.A., MAS-TUR, A. & ROIG-TIERNO, N., (2017). Synergistic effects and the co- existence of networks in clusters. *Entrepreneurship & Regional Development*, 29(1–2), pp.137–154.
- BIGGIERO, L. & SAMMARRA, A., (2010). Does geographical proximity enhance knowledge exchange? The case of the aerospace industrial cluster of Centre Italy.

- International Journal of Technology Transfer & Commercialisation*, 9(4), pp.283–305.
- BOSCHMA, R.A., (2005). Proximity and innovation: a critical assessment. *Regional Studies*, 39(1), pp.61–74.
- BOSCHMA, R.A. & FRENKEN, K., (2006). Why is economic geography not an evolutionary science? Towards an evolutionary economic geography. *Journal of Economic Geography*, 6, pp.273–302.
- BOSCHMA, R.A. & TER WAL, A.L.J., (2007). Knowledge Networks and Innovative Performance in an Industrial District: The Case of a Footwear District in the South of Italy. *Industry & Innovation*, 14(2), pp.177–199.
- BOSCHMA, R. & FRENKEN, K., (2009). The Spatial Evolution of Innovation Networks: A proximity Perspective. *Economic Geography*, p.46.
- BRESCHI, S. & LISSONI, F., (2001). Knowledge Spillovers and Local Innovation Systems: A Critical Survey. *Industrial and Corporate Change*, 10, pp.975–1005.
- BROEKEL, T. & BOSCHMA, R., (2012). Knowledge networks in the Dutch aviation industry: the proximity paradox. *Journal of Economic Geography*, 12, pp.409–433.
- BURT, R.S., (2004). Structural Holes and Good Ideas. *American Journal of Sociology*, 110(2), pp.349–399.
- CASSI, L., MORRISON, A. & TER WAL, A.L.J., (2012). The Evolution of Trade and Scientific Collaboration Networks in the Global Wine Sector: A Longitudinal Study Using Network Analysis. *Economic Geography*, 88(3), pp.311–334.
- CASSIMAN, B. & VEUGELERS, R., (2006). In Search of Complementarity in Innovation Strategy: Internal R&D and External Knowledge Acquisition. *Management Science*, 52(1), pp.68–82.
- COHEN, W.M. & LEVINTHAL, D.A., (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35(1), pp.128–152.
- COLEMAN, J.S., (1990). Foundations of Social Theory. In *Foundations of Social Theory*. p. 993.
- COSTA, M.T. & DUCH, N., (2005). La Renovación Del Sector Textil-Confeción En España. Proceso de ajuste y contenido tecnológico. *Economía Industrial*, 355/356, pp.263–272.
- CRESTANELLO, P. & TATTARA, G., (2011). Industrial clusters and the governance of the global value chain: The Romania-Veneto network in footwear and clothing. *Regional Studies*, 45(2), pp.187–203.
- DANSKIN, P. Y OTROS., (2005). Knowledge management as competitive advantage: lessons from the textile and apparel value chain. *Journal of Knowledge Management*, 9(2), pp.91– 102.
- DEEDS, D.L. & DEMIRKAN, I., (2013). Evolution of Research Collaboration Networks and Their Impact on Firm Innovation Output. In *Understanding the Relationship Between Networks and Technology, Creativity and Innovation*. Technology, Innovation, Entrepreneurship and Competitive Strategy. Emerald Group Publishing Limited, pp. 3–67.
- DEI OTTATI, G., (2014). A transnational fast fashion industrial district: An analysis of the Chinese businesses in Prato. *Cambridge Journal of Economics*, 38(5), pp.1247–1274.
- DEI OTTATI, G., (2009). An industrial district facing the challenges of globalization: Prato today. *European Planning Studies*, 17(12), pp.1817–1835.
- DEMIRKAN, I., DEEDS, D.L. & DEMIRKAN, S., (2012). The Role of Network Characteristics, Knowledge Quality, and Inertia on the Evolution of Scientific Networks. *Journal of Management*.
- EISINGERICH, A.B., BELL, S.J. & TRACEY, P., (2010). How can clusters sustain performance? The role of network strength, network openness, and environmental uncertainty. *Research Policy*, 39(2), pp.239–253.

- EXPÓSITO-LANGA, M., MOLINA-MORALES, F.X. & TOMÁS-MIQUEL, J.V., (2015). How shared vision moderates the effects of absorptive capacity and networking on clustered firms' innovation. *Scandinavian Journal of Management*, 31(3), pp.293–302.
- EXPOSITO-LANGA, M., TOMAS-MIQUEL, J.-V. & MOLINA-MORALES, F.X., (2015). Innovation in clusters: exploration capacity, networking intensity and external resources. *Journal of Organizational Change Management*, 28(1), pp.26–42.
- FORSMAN, H. & ANNALA, U., (2011). Small enterprises as innovators: shift from a low performer to a high performer. *International Journal of Technology Management*, 56(2/3/4), p.154.
- GIULIANI, E., (2007). The selective nature of knowledge networks in clusters: evidence from the wine industry. *Journal of Economic Geography*, 7(2), pp.139–168.
- GIULIANI, E. & BELL, M., (2005). The micro-determinants of meso-level learning and innovation: evidence from a Chilean wine cluster. *Research Policy*, 34(1), pp.47–68.
- GIULIANI, E. & PIETROBELLI, C., (2016). Social Network Analysis Methodologies for the Evaluation of Cluster Development Programs. In A. Mffiolli, C. Pietrobelli, & R. Stucchi, eds. *The Impact Evaluation of Cluster Development Programs Methods and Practices*. Washington, D.C: Inter-American Development Bank, pp. 37–58.
- HERVAS-OLIVER, J.L. Y OTROS., (2012). The role of a firm's absorptive capacity and the technology transfer process in clusters: How effective are technology centres in low-tech clusters? *Entrepreneurship and Regional Development*, 24(7–8), pp.523–559.
- HERVÁS-OLIVER, J.L. & ALBORS-GARRIGÓS, J., (2007). Do clusters capabilities matter? An empirical application of the resource-based view in clusters. *Entrepreneurship and Regional Development*, 19(2), pp.113–136.
- HERVAS-OLIVER, J.L.J.-L. & ALBORS-GARRIGOS, J., (2009). The role of the firm's internal and relational capabilities in clusters: when distance and embeddedness are not enough to explain innovation. *Journal of Economic Geography*, 9(2), pp.263–283.
- JANSEN, J.J.P., VAN DEN BOSCH, F.A.J. & VOLBERDA, H.W., (2006). Exploratory Innovation, Exploitative Innovation, and Performance: Effects of Organizational Antecedents and Environmental Moderators. *Management Science*, 52(11), pp.1661–1674.
- JANSEN, J.J.P., VAN DEN BOSCH, F. A J. & VOLBERDA, H.W., (2005). Managing Potential and Realised Absorptive Capacity: How do Organisational Antecedents Matter? *Academy of Management Journal*, 48(6), pp.999–1015.
- LORENZEN, M., (2007). Social capital and localised learning: Proximity and place in technological and institutional dynamics. *Urban Studies*, 44(4), pp.799–817.
- MASKELL, P. & MALMBERG, A., (1999). Localised Learning and Industrial Competitiveness. *Cambridge Journal of Economics*, 23(2), pp.167–185.
- MCFADYEN, M.A., SEMADENI, M. & CANNELLA, A. A., (2009). Value of Strong Ties to Disconnected Others: Examining Knowledge Creation in Biomedicine. *Organization Science*, 20(3), pp.552–564.
- MCFADYEN, M. & CANNELLA, A., (2004). Social capital and knowledge creation: Diminishing returns of the number and strength of exchange relationships. *Academy of Management Journal*, 47(5), pp.735–746.
- MCPHERSON, M., SMITH-LOVIN, L. & COOK, J.M., (2001). Birds of a feather : Homophily in Social Networks. *Annual Review of Sociology*, 27, pp.415–444.
- MOLINA-MORALES, F.X. Y OTROS., (2012). Analysis of business and knowledge networks in an industrial district. An application to the Valencian textile industrial district. *Cuadernos de Economía y Dirección de la Empresa*, 15(2), pp.94–102.
- MOLINA-MORALES, F.X. Y OTROS., (2015). Formation and dissolution of inter-firm linkages in lengthy and stable networks in clusters. *Journal of Business Research*, 68(7).

- MORRISON, A. & RABELLOTTI, R., (2009). Knowledge and Information Networks in an Italian Wine Cluster. *European Planning Studies*, 17, pp.983–1006.
- ORSENIGO, L., (2006). Clusters and Clustering: Stylized Facts, Issues, and Theories. In *Cluster Genesis*. Oxford University Press, pp. 195–217.
- PHELPS, C., HEIDL, R. & WADHWA, A., (2012). Knowledge, networks, and knowledge networks: A review and research agenda. *Journal of Management*, 38(4), pp.1115–1166.
- PICKLES, J. Y OTROS., (2006). Upgrading, changing competitive pressures, and diverse practices in the East and Central European apparel industry. *Environment and Planning A*, 38(12), pp.2305–2324.
- PLA-BARBER, J. & PUIG-BLANCO, F., (2009). Is the influence of the industrial district on international activities being eroded by globalization?. Evidence from a traditional manufacturing industry. *International Business Review*, 18, pp.435–445.
- PLUM, O. & HASSINK, R., (2011). On the Nature and Geography of Innovation and Interactive Learning: A Case Study of the Biotechnology Industry in the Aachen Technology Region, Germany. *European Planning Studies*, 19(7), pp.1141–1163.
- PUIG, F., GARCÍA-MORA, B. & SANTAMARÍA, C., (2013). The influence of geographical concentration and structural characteristics on the survival chance of textile firms. *Journal of Fashion Marketing and Management: An International Journal*, 17(1), pp.6–19.
- PUIG, F. & MARQUES, H., (2011). The dynamic evolution of the proximity effect in the textile industry. *European Planning Studies*, 19(8), pp.1423–1439.
- RAMÍREZ-PASILLAS, M., (2010). *International trade fairs as amplifiers of permanent and temporary proximities in clusters*.
- ROSENKOPF, L. & PADULA, G., (2008). Investigating the Microstructure of Network Evolution: Alliance Formation in the Mobile Communications Industry. *Organization Science*, 19(5), pp.669–687.
- ROTHAERMEL, F.T. & DEEDS, D.L., (2006). Alliance type, alliance experience and alliance management capability in high-technology ventures. *Journal of Business Venturing*, 21(4), pp.429–460.
- ROWLEY, T., BEHRENS, D. & KRACKHARDT, D., (2000). Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries. *Strategic Management Journal*, 21, pp.369–386.
- SAMMARRA, A. & BIGGIERO, L., (2008). Heterogeneity and specificity of inter-firm knowledge flows in innovation networks. *Journal of Management Studies*, 45(4), pp.800–829.
- SCHMIDT, T., (2010). Absorptive capacity-one size fits all? A firm-level analysis of absorptive capacity for different kinds of knowledge. *Managerial and Decision Economics*, 31, pp.1–18.
- STAM, W. & ELFRING, T., (2008). Entrepreneurial orientation and new venture performance: The moderating role of intra- and extraindustry social capital. *Academy of Management Journal*, 51(1), pp.97–111.
- TALLMAN, S. Y OTROS., (2004). Knowledge, clusters, and competitive advantage. *Academy of Management Review*, 29(2), pp.258–271.
- TEECE, D.J., (2010). Business models, business strategy and innovation. *Long Range Planning*, 43(2–3), pp.172–194.
- TODTLING, F., ASHEIM, B. & BOSCHMA, R., (2013). Knowledge sourcing, innovation and constructing advantage in regions of Europe. *European Urban and Regional Studies*, 20(2), pp.161–169.
- TOMÁS-MIQUEL, J.-V., MOLINA-MORALES, F.-X. & EXPOSITO-LANGA, M., (2012). Evolution of Spanish industrial districts: how are they evolving and adapting in the face of globalization? In F. Belussi & U. Staber, eds. *Managing networks of creativity*. New York: Routledge, pp. 335–352.

- TER WAL, A.L.J. & BOSCHMA, R.A., (2009). Applying social network analysis in economic geography: framing some key analytic issues. *The Annals of Regional Science*, 43, pp.739–756.
- ZAHRA, S.A. & GEORGE, G., (2002). Absorptive capacity: a review, reconceptualization, and extension. *Academy of management Review*, 27(2), pp.185–203.

EFFECTOS ECONÓMICOS DEL BREXIT SOBRE EL MERCADO COMÚN DE LA PESCA: ANÁLISIS DE LAS PERCEPCIONES DE EMPRESAS ESPAÑOLAS

M^a DOLORES GARZA-GIL

Department of Applied Economics/University of Vigo/
Lagoas-Marcosende s/n, 36310 Vigo, Spain/Tel: 34 986 812515 Fax: 34 986 812401

MANUEL M. VARELA-LAFUENTE

Department of Applied Economics/University of Vigo/
Lagoas-Marcosende s/n, 36310 Vigo, Spain

LUCY AMIGO-DOBAÑO (corresponding author)

Department of Applied Economics, University of Vigo, Lagoas-Marcosende s/n, 36310 Vigo, Spain

e-mail Lucy Amigo-Dobaño: lamigo@uvigo.es

Abstract

Las incertidumbres vinculadas al proceso del Brexit representan un tema de máximo interés en el marco de la Unión Europea, siendo particularmente relevante el análisis de la evolución de la Política Pesquera Común sin la participación del Reino Unido y su incidencia en España, particularmente en Galicia, por su importancia pesquera en Europa. En el presente estudio se aborda el análisis de la percepción de las empresas vinculadas al sector de la pesca-acuicultura de Galicia, considerando una muestra de 275 empresas encuadradas en las ramas de mayor peso dentro del sector – pesca marina, comercio al mayor, fabricación de conservas de pescado, acuicultura marina y procesado de pescado. La metodología de trabajo ha sido cuantitativa, realizándose un análisis de percepciones en materia de comercio de mercancías, movilidad de trabajadores, así como en materia de Política Exterior Pesquera y acceso a los recursos pesqueros; e inferencial mediante la consideración de tablas de contingencia en función de los factores extraídos. Los resultados reflejan una percepción mayoritariamente negativa al proceso Brexit por parte de las empresas de las ramas de actividad Pesca Marina y Comercialización de productos pesqueros, siendo dicha percepción particularmente significativa en las empresas de menor dimensión.

Key Words: Recursos Pesqueros; Política Pesquera Común; Brexit, Percepciones.

Abstract

The referendum on the exit of the United Kingdom of the European Union implied to initiate a period of strong uncertainties on how to manage this exit and, in particular, on how to harmonize internal, foreign policy, and economic issues after the Brexit. The present study deals with the analysis of the perception of companies linked to the fisheries sectors in Galicia, one of the European regions potentially most affected by the Brexit. To this end, a sample of 275 companies are used in the branches of greater weight within the sector of fisheries –fisheries, wholesale trade, manufacture of canned fish, marine aquaculture and fish processing. The work methodology has been quantitative, with an analysis of perceptions on merchandise trade, workers' mobility, as well as on fisheries foreign policy and access to fishery resources; and inference through the consideration of contingency tables depending on the factors extracted. The results reflect a majority negative perception of the effects of the Brexit.

Key Words: Brexit; European Common Fisheries Policy, attitudes; contingency tables.

1. INTRODUCCIÓN

Tras su ingreso en la Unión Europea (UE) en 1973, el Reino Unido ha formado parte de la Política Pesquera Común (CFP), que permite a todos los países comunitarios faenar entre las 12 y 200 millas de sus costas, siempre que se disponga de cuota de pesca para ello. Existen más de cien stocks compartidos con el Reino Unido (RU) en el Atlántico nororiental bajo el actual marco de la CFP. Entre 60 y 70 barcos españoles operan en aguas británicas, procedentes fundamentalmente de Galicia y del País Vasco, y un número significativo de buques holandeses y españoles se abanderaron en Reino Unido a finales de los años noventa para tener acceso a las cuotas de pesca británicas bajo la regulación europea (las conocidas como *quota-hopping*, existen 140 buques de capital español faenando en RU, Francia e Irlanda; Sobrino, 2016). Pero, además y junto con Francia, España es uno de los principales mercados de destino de los productos del mar de origen británico (Sobrino, 2016). Una vez que el Reino Unido ha tomado la decisión de abandonar la UE (Brexit) en marzo de 2019 (Warlouzet, 2018), y dependiendo de las condiciones en las que se materialice tal desconexión, ello tendrá repercusiones sobre la actividad económica de las empresas relacionadas con los productos del mar reduciendo previsiblemente las posibilidades de pesca para los buques españoles y gallegos. Otros países como Alemania, Francia, Irlanda y Países Bajos también se podrían ver afectados por el Brexit; el Reino Unido acaba de anular en 2017 la Convención de Pesca de Londres, firmada hace aproximadamente cincuenta años, por la cual barcos de estos países podían faenar entre una zona de seis y doce millas de la costa británica, y viceversa. De momento, las asociaciones de pescadores españolas han pedido a la UE opciones negociadoras que eviten la pérdida de posibilidades de pesca y puestos de trabajo como consecuencia del Brexit. También piden que se respeten los fondos estructurales pesqueros e instan a tener en cuenta que la salida del Reino Unido de la UE supone una ruptura de la circunstancia que dio lugar al principio de estabilidad relativa, por el cual la flota española ha estado infrarrepresentada en la asignación de cuotas de pesca en relación a su tamaño y capacidad pesquera (Sobrino, 2016).

Conocer la percepción de los agentes económicos sobre el proceso de toma de decisiones contribuye a reducir o evitar conflictos con los pescadores, incrementar su responsabilidad hacia la conservación del recurso marino, e incrementar el grado de legitimidad de las instituciones y el grado de cumplimiento de las normas (Cochrane, 1999; Garza and Varela, 2015; Hatcher and Gordon, 2005; Jentoft, 1989; Mikalsen and Jentoft, 2008; Pita et al., 2010). En la literatura de pesquerías, el análisis de las percepciones de los pescadores se ha centrado en estudiar su posible mayor participación en el proceso de toma de decisiones, concluyendo que cuanto mayor sea el nivel de co-gestión mayor será el éxito de las medidas de regulación (Gelcich et al., 2009; Jentoft and McCay, 1995; Pita et al., 2010), o en analizar su percepción sobre los incentivos/desincentivos diseñados para el cumplimiento de las normas pesqueras resaltando atributos como la moralidad individual, la presión social o incluso características de la propia regulación como es el grado de legitimidad de las instituciones que diseñan las normas pesqueras (Jagers et al., 2012; Garza et al., 2015; Hatcher et al., 2000; Kuperan and Sutinen, 1998).

En este contexto, en este trabajo se analizan las percepciones de las empresas vinculadas al sector de la pesca y acuicultura de Galicia, diferenciando las ramas de actividad más significativas -pesca marina, acuicultura marina, procesado de pescado, fabricación de conservas de pescado y comercialización-, y considerando factores vinculados al comercio de mercancías, a la movilidad de trabajadores y acceso a los recursos pesqueros. Asimismo, y a partir de la metodología de Tablas de Contingencia, se analizará la relación o independencia entre las percepciones de las empresas en lo referente a las cuestiones planteadas y el subsector (rama de actividad), el tamaño de empresa o el nivel de facturación. El trabajo se estructura de la siguiente forma: en la Sección 2 se describe el caso de estudio y se plantea el método a utilizar; en la Sección 3, se muestran los resultados del análisis; y, por último, en la Sección 4 se resaltan las principales conclusiones del trabajo.

2. CASO DE ESTUDIO

El estudio tiene como objetivo fundamental el análisis de las percepciones de las empresas vinculadas a las actividades pesqueras gallegas hacia las condiciones y posibles efectos del Brexit sobre dichas actividades. Para ello, se propone una batería de hipótesis referidas al tipo de modelo de implementación del proceso del Brexit, tratando de identificar y contrastar la significatividad estadística diferenciada de las percepciones de las empresas en función del subsector, tamaño de empresa y nivel de facturación. La población objeto de estudio está formada por empresas gallegas cuya actividad principal está relacionada con la producción, transformación o comercialización de productos del mar. Según IGE (2017), existen 697 empresas pesqueras con el código CNAE 0311 en el año 2015 (pesca artesanal y costera no incluidas en este dato), 174 empresas acuícolas con el código CNAE 0321 (sin contabilizar las bateas) y 212 empresas dedicadas a la transformación y conserva de productos del mar con el código CNAE 10.2 (de las cuales 60 son empresas conserveras). No existe información desagregada sobre las empresas dedicadas a la comercialización de productos pesqueros; este dato se publica agregado para la rama "Comercialización de

productos alimenticios, bebidas y tabaco” (código CNAE 46.3), existiendo un total de 3855 empresas en el año 2015, la mayoría de ellas dedicadas a la comercialización de productos agrícolas dado el mayor peso de estos productos en la economía de Galicia (aproximadamente el 3.5% del PIB en 2015 frente al 1% de la pesca y la acuicultura; IGE, 2017).

La información sobre las actitudes se recopiló a través de la realización de un cuestionario estratificado mediante entrevistas personales y envíos electrónicos. En particular, se solicitó a los encuestados que respondieran a preguntas relativas a las posibles repercusiones del Brexit sobre su actividad económica y sobre la duración del proceso de desconexión. Además, se les pidió que respondieran a preguntas sobre los potenciales impactos en los trabajadores comunitarios de empresas de estos sectores radicadas en RU y sobre el flujo de exportaciones del RU a la UE. Por otro lado, se plantearon a los encuestados preguntas relativas a las posibles consecuencias sobre la Política Exterior Pesquera en materia de acuerdos internacionales de pesca, dado que una parte significativa de la flota española (y gallega) faena en aguas de terceros países o en aguas de alta mar gestionadas por organizaciones internacionales. En este sentido, la UE mantiene acuerdos con países escandinavos no-EU con zonas de pesca adyacentes a caladeros europeos y a las que se sumará el RU tras el Brexit, y forma parte además de organizaciones regionales en las que participan países de la Commonwealth y con los que el RU previsiblemente se alineará en la toma de decisiones (son los casos de la Organización de Pesquerías del Atlántico Norte –NAFO, o de la Comisión para la Conservación de los Recursos Marinos Vivos Antárticos –CCAMLR). Asimismo, y en el caso concreto de las empresas pesqueras (código CNAE 0311), se solicitó su opinión sobre cuestiones relacionadas con el actual acceso a aguas británicas (tanto de buques con bandera española como de buques con bandera británica pero de capital español) y con la actual CFP (posibilidad de reformular el principio de estabilidad relativa, el sistema de cuotas o el Fondo Europeo Marítimo Pesquero -FEMP).

Tabla 1. Tamaño de la muestra

By NACE CODE of Segment	Sample (%)
0311: Fishing	26.0
0321: Marine Aquaculture	6.2
1021: Fish processing	2.9
1022: Fish canning	6.6
4638: Fish marketing	58.2
By turnover level (€)	
< 100000	0.7
100000 - 499000	6.7
500000 – 999 999	20.8
1000000 – 2999999	40.5
3000000 – 4999999	10.4
> 5000000	20.8
By firm size (number of jobs)	
< 10	56.4
10 – 49	38.5
20 – 249	4.4
> 250	0.7

Fuente: Recopilación hecha por los autores

El número de cuestionarios finalmente completado ha sido de 275, con una tasa de éxito (respuestas obtenidas sobre nº total de cuestionarios) del 40.1%. La distribución de cuestionarios completados según actividad económica es como sigue (ver Tabla 1): 26% referidas a empresas del subsector pesca marina; 6% acuicultura marina; 3% procesado de pescado; 7% fabricación de conservas; y 58% empresas comercializadoras. En la Tabla 1 se puede observar la clasificación de las empresas encuestadas por nivel de facturación y tamaño de empresa. Con respecto al nivel de facturación, la mayor parte de las empresas encuestadas (41%) presentan un rango de facturación entre 1.000.000-2.999.999 euros. La distribución de empresas por tamaño, considerando el número de empleados, refleja la pequeña dimensión de las mismas

en general, pues el 56% de las empresas encuestadas presentan menos de diez trabajadores, seguidas por las empresas de 10 a 49 trabajadores, que representan el 39% de la muestra.

3. RESULTADOS

En la Tabla 2 se sintetizan las percepciones analizadas y se refleja el análisis estadístico de las respuestas obtenidas con los cuestionarios. Los resultados del análisis muestran una elevada incertidumbre -grado de incertidumbre medio en torno al 60%- en todo el proceso concerniente al Brexit, tanto en aspectos genéricos referidos a percepciones sobre las implicaciones que el proceso del "Brexit" puede generar en la actividad económica de las empresas, como cuestiones más específicas referidas a implicaciones sobre los trabajadores comunitarios, implicaciones en el comercio de mercancías y en la Política Exterior Pesquera.

Tabla 2. Descripción de variables

Descripción de variables	Media (SD)	Frecuencia de ocurrencia (%)		
		Nivel 1	Nivel 2	Nivel 3
<i>Percepción general de las Empresas Encuestadas sobre el proceso del Brexit</i>				
Cuál es su percepción general sobre las implicaciones que el proceso del "Brexit" puede generaren la actividad económica de su empresa (=1 favorable, =2 desfavorable, =3 ninguna)	2.71 (0.493)	1.8	25.3	72.9
Desde su punto de vista, ¿sería preferible que el proceso del "Brexit" fuese: (=1 de aplicación inmediata, =2 un proceso transitorio, flexible y con posibilidad de acuerdos bilaterales, =3 no sabe)	2.64 (0.559)	4.0	28.4	67.6
<i>Percepción de las Empresas Encuestadas sobre las implicaciones del Brexit en la MOVILIDAD DE TRABAJADORES COMUNITARIOS</i>				
Proceso del "Brexit" y sus implicaciones sobre trabajadores comunitarios que estén trabajando actualmente en empresas vinculadas al sector marítimopesquero en UK. Cree usted que el proceso del Brexit puede tener repercusiones sobre la situación laboral de dichos trabajadores (derechos de permanencia, prestaciones sociales, etc)? (=1 sí, =2 no, =3 no sabe)	2.35 (0.929)	31.6	1.8	66.5
Proceso del "Brexit" y sus implicaciones sobre trabajadores comunitarios que pretendan acceder al mercado laboral en empresas vinculadas al sector marítimo- pesquero en UK. Cree usted que el proceso del "Brexit" puede suponer un cambio importante para los trabajadores que accedan por primera vez al mercado laboral UK respecto a la situación de los trabajadores actuales? (=1 sí, =2 no, =3 no sabe)	2.38 (0.922)	30.5	0.7	68.7
<i>Percepción de las Empresas Encuestadas sobre las implicaciones del Brexit en el COMERCIO DE MERCANCÍAS</i>				
Cree usted que el proceso del "Brexit" puede repercutir en España: (=1 positivamente, =2 negativamente, =3 no sabe)	2.48 (0.581)	4.4	43.6	52.0
Cree usted que el proceso del "Brexit" puede repercutir en su empresa: (=1 positivamente, =2 negativamente, =3 no sabe)	2.67 (0.544)	3.7	25.7	70.6
<i>Percepción de las Empresas Encuestadas sobre las implicaciones del Brexit en materia de POLITICA EXTERIOR PESQUERA</i>				
Cree usted que en materia de POLITICA EXTERIOR PESQUERA (Acuerdos internacionales, Presencia en Organismos Internacionales, NAFO, FAO, etc..) la salida de UK, supondrá una incidencia (=1 positiva, =2 negativa, =3 no sabe)	2.62 (0.550)	3.3	31.6	65.1
<i>Percepción de las Empresas de PESCA MARINA encuestadas, sobre las implicaciones del Brexit en materia de ACCESO A LOS RECURSOS</i>				
En conjunto, cree usted, que en la práctica los pescadores españoles (con bandera española) tendrán un escenario: (=1 más favorable, =2 menos favorable, =3 indifente)	2.18 (0.550)	7.0	66.2	26.8
Cree usted, que ante este nuevo escenario, sería posible y deseable reformular (=1 E.R.Principio Estabilidad Relativa, =2 Sistema TACs y reparto CUOTAS, =3 no sabe). La posible respuesta múltiple reflejó que un 8% percibe favorable reformular ER y TACs, conjuntamente.	2.67 (0.561)	9.1	17.5	65.4
Cree usted que el proceso del "Brexit" puede suponer un cambio importante (negativo) para la flota gallega con pabellón UK? (=1 sí, =2 no, =3 no sabe)	1.75 (0.936)	59.2	7.0	33.8
El proceso del "Brexit" supondrá que habrá un país menos en aportar fondos al FEMP (Fondo Europeo Marítimo Pesquero) y así mismo también un país menos en el reparto de los fondos. En este escenario, cuál cree usted que será el resultado de ambos efectos, cómo afectará a España esta nueva situación: (=1 Tendrá un efecto positivo sobre España, se estima que percibiremos más subvenciones, =2 Tendrá un efecto negativo sobre España, se estima que percibiremos menos subvenciones, =3 no sabe)	2.788 (0.475)	2.8	15.5	81.7

Fuente: Elaboración propia.

Una primera aproximación a la percepción general de los encuestados sobre el proceso del Brexit, ha sido realizada y dichos resultados reflejan que, al margen de la incertidumbre del 72.9%, un número importante de empresas perciben desfavorablemente las implicaciones que el proceso del Brexit puede generar en la actividad económica de su empresa -con un porcentaje del 25.3%- y tan solo un 1.8% lo percibe favorable. Los encuestados consideran además que sería preferible una aplicación transitoria y flexible con posibilidad de acuerdos bilaterales (28.4%) frente a al 4% que considera preferible su aplicación inmediata.

En cuanto a aspectos concretos, las percepciones de las empresas sobre las hipótesis planteadas referidas a la movilidad de trabajadores, aproximadamente el 30% considera que el proceso del Brexit puede afectar tanto a trabajadores comunitarios que estén trabajando actualmente en empresas vinculadas al sector marítimo-pesquero en UK. -derechos de permanencia, prestaciones sociales, etc- y también implicaciones sobre trabajadores comunitarios que pretendan acceder por primera vez al mercado laboral en empresas vinculadas al sector marítimo-pesquero en UK; tan solo por término medio el 1.25% considera que ello no generaría modificaciones sobre la situación actual.

En materia de comercio de mercancías, el análisis evidencia que un 43.6% de las empresas encuestadas perciben que el proceso del Brexit puede repercutir de manera negativa en España frente a un 4% que considera que puede repercutir positivamente -52% incertidumbre-. Dicho estudio, cuando se particulariza analizando la percepción sobre su propia empresa en particular, un 25.7% considera que ello generaría repercusiones negativas y un 3.7% considera que serían positiva. Por tanto, pudiera extraerse la idea de que si bien el proceso del Brexit se percibe de forma negativa para las empresas en general, dicho porcentaje parece constatar de menor dimensión en las empresas vinculadas a las actividades pesqueras gallegas.

Por su parte, en el ámbito de la Política Exterior Pesquera, esto es, en términos de Acuerdos Internacionales, presencia en Organismos Internacionales, etc, se percibe negativamente la salida de UK en un 31.6% de los encuestados, frente a tan solo un 3.3% que lo percibe de forma positiva.

En el contexto de análisis de las empresas vinculadas a las actividades pesqueras gallegas, el estudio de las percepciones de las empresas de Pesca Marina (código CNAE 0311) en particular y en materia de acceso a los recursos tiene especial interés. Los resultados ponen de manifiesto una menor incertidumbre en este subsector de actividad, tal vez propiciado por el mayor conocimiento de su sector de actividad, revelándose una actitud claramente negativa de las empresas encuestadas al considerar que los pescadores españoles (con bandera española) tendrán un escenario menos favorable en cuanto a materia de acceso a los recursos pesqueros, obteniéndose que un 66.2% percibe que los pescadores españoles tendrán una situación menos favorable, frente a solo un 7% que la considera favorable.

Ante ese nuevo escenario, las empresas de Pesca Marina creen que sería posible y deseable reformular, por orden de importancia, el Sistema TACs y reparto de cuotas y, en menor medida, el Principio Estabilidad Relativa (PER). Asimismo, la práctica totalidad de los que perciben favorablemente la reformulación del PER, optan por una respuesta múltiple, lo cual pone de manifiesto la necesidad o percepción mayoritaria de adaptar/reformular ambas cuestiones pero, fundamentalmente, el sistema de TACs y reparto de cuotas. Por su parte, en referencia al tema de la flota gallega con pabellón UK, un 59.2% de las empresas de pesca marina perciben que el proceso del Brexit puede suponer un cambio importante y negativo para esa flota, frente a solo un 7% que considera que ello no generaría alteración. Finalmente, teniendo en consideración el hecho de que el proceso del "Brexit" supondrá que habrá un país menos en aportar fondos al FEMP y en el reparto de los fondos, las percepciones obtenidas apuntan a que solo un 2.8% considera que el resultado de ambos efectos tendrá un reflejo positivo sobre España, mientras que el 15,5% estima un efecto negativo al considerar que se percibirían menos subvenciones, siendo en todo caso muy elevado el nivel de incertidumbre.

Tabla 3. Percepción general sobre las implicaciones que el proceso del “Brexit” puede generar en la actividad económica de la empresa

			Level of Perception			Total
			1	2	3	
CNAE	0311	% del total	1,5%	9,2%	15,4%	26,0%
		Residuo corregido	2,8	2,2	-3,0	
	0321	% del total	0,0%	1,1%	5,1%	6,2%
		Residuo corregido	-6	-7	,9	
	1021	% del total	0,0%	,4%	2,6%	2,9%
		Residuo corregido	-4	-8	,9	
	1022	% del total	0,0%	1,5%	5,1%	6,6%
		Residuo corregido	-6	-3	,5	
	4638	% del total	,4%	13,2%	44,7%	58,2%
		Residuo corregido	-1,8	-1,2	1,7	
Total		% del total	1,8%	25,3%	72,9%	100,0%
Nivel facturación	1	% del total	0,0%	0,0%	,7%	,7%
		Residuo corregido	-2	-8	,9	
	2	% del total	0,0%	1,5%	5,2%	6,7%
		Residuo corregido	-6	-3	,5	
	3	% del total	,4%	6,7%	13,8%	20,8%
		Residuo corregido	,0	1,3	-1,2	
	4	% del total	1,1%	8,6%	30,9%	40,5%
		Residuo corregido	,9	-1,4	1,1	
	5	% del total	0,0%	1,1%	9,3%	10,4%
		Residuo corregido	-8	-1,9	2,1	
	6	% del total	,4%	7,8%	12,6%	20,8%
		Residuo corregido	,0	2,3	-2,2	
Total		% del total	1,9%	25,7%	72,5%	100,0%
Tamaño Empresa (número de empleados)	1	% del total	,4%	12,8%	43,6%	56,8%
		Residuo corregido	-1,7	-1,2	1,7	
	2	% del total	1,1%	10,6%	26,4%	38,1%
		Residuo corregido	1,0	,8	-1,1	
	3	% del total	0,0%	1,5%	2,9%	4,4%
		Residuo corregido	-5	,7	-5	
	4	% del total	,4%	,4%	0,0%	,7%
		Residuo corregido	5,1	,8	-2,3	
Total		% del total	1,8%	25,3%	72,9%	100,0%

Nota: 1=favorable; 2=desfavorable; 3=ninguna.

Fuente: Elaboración propia.

Tabla 4. Procedimiento de aplicación del Brexit

			Level of Perception			Total
			1	2	3	
CNAE	0311	% del total	1,1%	9,1%	15,6%	25,8%
		Residuo corregido	,1	1,5	-1,5	
	0321	% del total	,4%	,4%	5,5%	6,2%
		Residuo corregido	,4	-2,1	1,9	
	1021	% del total	0,0%	,7%	2,2%	2,9%
		Residuo corregido	-6	-2	,5	
	1022	% del total	,7%	2,2%	3,6%	6,5%
		Residuo corregido	1,6	,5	-1,1	
	4638	% del total	1,8%	16,0%	40,7%	58,5%
		Residuo corregido	-9	-5	,8	
Total		% del total	4,0%	28,4%	67,6%	100,0%
Nivel facturación	1	% del total	0,0%	0,0%	,7%	,7%
		Residuo corregido	-,3	-,9	1,0	
	2	% del total	,4%	1,1%	5,2%	6,6%
		Residuo corregido	,3	-1,1	1,0	
	3	% del total	,7%	5,9%	14,4%	21,0%
		Residuo corregido	-,2	-,1	,2	
	4	% del total	,7%	11,8%	28,0%	40,6%
		Residuo corregido	-1,5	,2	,5	
	5	% del total	0,0%	1,8%	8,5%	10,3%
		Residuo corregido	-1,1	-1,3	1,7	
	6	% del total	2,2%	7,7%	10,7%	20,7%
		Residuo corregido	2,8	1,7	-2,8	
Total		% del total	4,1%	28,4%	67,5%	100,0%
Tamaño Empresa (número de empleados)	1	% del total	1,1%	12,7%	42,5%	56,4%
		Residuo corregido	-2,0	-2,4	3,2	
	2	% del total	2,2%	13,1%	23,3%	38,5%
		Residuo corregido	1,1	1,6	-2,0	
	3	% del total	,7%	1,8%	1,8%	4,4%
		Residuo corregido	2,3	1,0	-2,0	
	4	% del total	0,0%	,7%	0,0%	,7%
		Residuo corregido	-,3	2,3	-2,1	
Total		% del total	4,0%	28,4%	67,6%	100,0%

Nota: 1=de aplicación inmediata; 2=proceso transitorio, flexible y con posibilidad de acuerdos bilaterales; 3=no sabe/no contesta.

Fuente: Elaboración propia.

Tabla 5. Proceso del “Brexit” y sus implicaciones sobre trabajadores comunitarios que estén trabajando actualmente en empresas vinculadas al sector marítimo-pesquero en UK

			Level of Perception			Total
			1	2	3	
CNAE	0311	% del total	12,0%	0,0%	13,8%	25,8%
		Residuo corregido	3,1	-1,3	-2,7	
	0321	% del total	1,1%	1,1%	4,0%	6,2%
		Residuo corregido	-1,3	5,0	-2	
	1021	% del total	,4%	0,0%	2,5%	2,9%
		Residuo corregido	-1,2	-4	1,3	
	1022	% del total	1,5%	0,0%	5,1%	6,5%
		Residuo corregido	-,9	-,6	1,0	
	4638	% del total	16,7%	,7%	41,1%	58,5%
		Residuo corregido	-1,3	-,8	1,5	
Total		% del total	31,6%	1,8%	66,5%	100,0%
Nivel facturación	1	% del total	,4%	0,0%	,4%	,7%
		Residuo corregido	,6	-,2	-,5	
	2	% del total	2,2%	1,1%	3,3%	6,6%
		Residuo corregido	,2	4,8	-1,5	
	3	% del total	5,2%	,7%	15,1%	21,0%
		Residuo corregido	-1,3	1,1	1,0	
	4	% del total	12,5%	0,0%	28,0%	40,6%
		Residuo corregido	-,2	-1,9	,8	
	5	% del total	1,8%	0,0%	8,5%	10,3%
		Residuo corregido	-1,7	-,8	1,9	
	6	% del total	9,6%	0,0%	11,1%	20,7%
		Residuo corregido	2,7	-1,2	-2,3	
Total		% del total	31,7%	1,8%	66,4%	100,0%
Tamaño Empresa (número de empleados)	1	% del total	15,3%	1,5%	39,6%	56,4%
		Residuo corregido	-1,8	1,1	1,5	
	2	% del total	14,5%	,4%	23,6%	38,5%
		Residuo corregido	1,7	-,9	-1,5	
	3	% del total	1,5%	0,0%	2,9%	4,4%
		Residuo corregido	,1	-,5	,0	
	4	% del total	,4%	0,0%	,4%	,7%
		Residuo corregido	,6	-,2	-,5	
Total		% del total	31,6%	1,8%	66,5%	100,0%

Nota: 1=si; 2=no; 3=no sabe/no contesta.

Fuente: Elaboración propia.

Tabla 6. Proceso del “Brexit” y sus implicaciones sobre trabajadores comunitarios que pretendan acceder al mercado laboral en empresas vinculadas al sector marítimo-pesquero en UK

			Level of Perception			Total
			1	2	3	
CNAE	0311	% del total	12,4%	0,0%	13,5%	25,8%
		Residuo corregido	3,7	-8	-3,5	
	0321	% del total	1,1%	0,0%	5,1%	6,2%
		Residuo corregido	-1,2	-4	1,3	
	1021	% del total	0,0%	0,0%	2,9%	2,9%
		Residuo corregido	-1,9	-2	1,9	
	1022	% del total	1,5%	0,0%	5,1%	6,5%
		Residuo corregido	-8	-4	,9	
	4638	% del total	15,6%	,7%	42,2%	58,5%
		Residuo corregido	-1,6	1,2	1,4	
Total		% del total	30,5%	,7%	68,7%	100,0%
Nivel facturación	1	% del total	,4%	0,0%	,4%	,7%
		Residuo corregido	,6	-,1	-,6	
	2	% del total	2,2%	,7%	3,7%	6,6%
		Residuo corregido	,3	5,3	-1,2	
	3	% del total	4,8%	0,0%	16,2%	21,0%
		Residuo corregido	-1,4	-,7	1,6	
	4	% del total	13,3%	0,0%	27,3%	40,6%
		Residuo corregido	,6	-1,2	-,4	
	5	% del total	1,8%	0,0%	8,5%	10,3%
		Residuo corregido	-1,5	-,5	1,6	
	6	% del total	8,1%	0,0%	12,5%	20,7%
		Residuo corregido	1,6	-,7	-1,4	
Total		% del total	30,6%	,7%	68,6%	100,0%
Tamaño Empresa (número de empleados)	1	% del total	14,5%	,7%	41,1%	56,4%
		Residuo corregido	-1,9	1,2	1,7	
	2	% del total	14,2%	0,0%	24,4%	38,5%
		Residuo corregido	1,8	-1,1	-1,6	
	3	% del total	1,5%	0,0%	2,9%	4,4%
		Residuo corregido	,2	-,3	-,2	
	4	% del total	,4%	0,0%	,4%	,7%
		Residuo corregido	,6	-,1	-,6	
Total		% del total	30,5%	,7%	68,7%	100,0%

Nota: 1=si; 2=no; 3=no sabe/no contesta.

Fuente: Elaboración propia.

Tabla 7. Procedimiento de “Brexit” sobre el Comercio de Mercancías. Repercusión en España

			Level of Perception			Total	
			1	2	3		
CNAE	0311	% del total	1,8%	14,2%	9,8%	25,8%	
		Residuo corregido	1,3	2,2	-2,7		
	0321	% del total	0,0%	2,2%	4,0%	6,2%	
		Residuo corregido	-,9	-,7	1,1		
	1021	% del total	0,0%	,7%	2,2%	2,9%	
		Residuo corregido	-,6	-,1,1	1,3		
	1022	% del total	,4%	1,5%	4,7%	6,5%	
		Residuo corregido	,3	-1,9	1,8		
	4638	% del total	2,2%	25,1%	31,3%	58,5%	
		Residuo corregido	-,6	-,3	,6		
Total		% del total	4,4%	43,6%	52,0%	100,0%	
Nivel facturación	1	% del total	0,0%	,7%	0,0%	,7%	
		Residuo corregido	-,3	1,6	-1,5		
	2	% del total	,4%	3,0%	3,3%	6,6%	
		Residuo corregido	,2	,0	-,1		
	3	% del total	,4%	8,9%	11,8%	21,0%	
		Residuo corregido	-1,1	-,3	,8		
	4	% del total	2,2%	16,6%	21,8%	40,6%	
		Residuo corregido	,7	-,8	,5		
	5	% del total	,4%	4,1%	5,9%	10,3%	
		Residuo corregido	-,2	-,5	,6		
	6	% del total	1,1%	10,7%	8,9%	20,7%	
		Residuo corregido	,4	1,3	-1,5		
	Total		% del total	4,4%	43,9%	51,7%	100,0%
	Tamaño Empresa (número de empleados)	1	% del total	2,2%	22,5%	31,6%	56,4%
Residuo corregido			-,5	-1,4	1,6		
2		% del total	1,5%	18,9%	18,2%	38,5%	
		Residuo corregido	-,4	1,4	-1,3		
3		% del total	,4%	1,8%	2,2%	4,4%	
		Residuo corregido	,7	-,1	-,1		
4		% del total	,4%	,4%	0,0%	,7%	
		Residuo corregido	3,2	,2	-1,5		
Total		% del total	4,4%	43,6%	52,0%	100,0%	

Nota: 1=positivamente; 2=negativamente; 3=no sabe/no contesta.

Fuente: Elaboración propia.

Tabla 8. Procedimiento de “Brexit” sobre el Comercio de Mercancías. Repercusión en la Empresa

			Level of Perception			Total	
			1	2	3		
CNAE	0311	% del total	1,5%	9,2%	15,4%	26,1%	
		Residuo corregido	1,0	2,1	-2,5		
	0321	% del total	0,0%	,4%	5,9%	6,3%	
		Residuo corregido	-,8	-1,9	2,2		
	1021	% del total	0,0%	0,0%	2,9%	2,9%	
		Residuo corregido	-,6	-1,7	1,9		
	1022	% del total	0,0%	1,8%	4,8%	6,6%	
		Residuo corregido	-,9	,2	,2		
	4638	% del total	2,2%	14,3%	41,5%	58,1%	
		Residuo corregido	,1	-,5	,4		
Total		% del total	3,7%	25,7%	70,6%	100,0%	
Nivel facturación	1	% del total	0,0%	0,0%	,7%	,7%	
		Residuo corregido	-,3	-,8	,9		
	2	% del total	0,0%	1,5%	5,2%	6,7%	
		Residuo corregido	-,9	-,4	,7		
	3	% del total	,4%	5,6%	14,9%	20,9%	
		Residuo corregido	-,9	,2	,2		
	4	% del total	1,9%	9,0%	29,5%	40,3%	
		Residuo corregido	,6	-1,1	,8		
	5	% del total	,4%	1,9%	8,2%	10,4%	
		Residuo corregido	,0	-1,0	1,0		
	6	% del total	1,1%	7,8%	11,9%	20,9%	
		Residuo corregido	,7	2,3	-2,5		
	Total		% del total	3,7%	25,7%	70,5%	100,0%
	Tamaño Empresa (número de empleados)	1	% del total	1,8%	12,1%	42,6%	56,6%
Residuo corregido			-,4	-1,9	2,0		
2		% del total	1,1%	12,1%	25,0%	38,2%	
		Residuo corregido	-,5	1,8	-1,5		
3		% del total	,4%	1,1%	2,9%	4,4%	
		Residuo corregido	,9	-,1	-,3		
4		% del total	,4%	,4%	0,0%	,7%	
		Residuo corregido	3,5	,8	-2,2		
Total		% del total	3,7%	25,7%	70,6%	100,0%	

Nota: 1=positivamente; 2=negativamente; 3=no sabe/no contesta.

Fuente: Elaboración propia.

Tabla 9. Procedimiento de "Brexit en materia de Política Exterior Pesquera

			Level of Perception			Total
			1	2	3	
CNAE	0311	% del total	1,5%	6,9%	17,5%	25,8%
		Residuo corregido	1,3	-1,0	,5	
	0321	% del total	0,0%	3,6%	2,5%	6,2%
		Residuo corregido	-,8	2,5	-2,1	
	1021	% del total	,4%	,4%	2,2%	2,9%
		Residuo corregido	1,5	-1,2	,6	
	1022	% del total	,4%	1,8%	4,4%	6,5%
		Residuo corregido	,6	-,4	,1	
	4638	% del total	1,1%	18,9%	38,5%	58,5%
		Residuo corregido	-1,6	,3	,3	
Total		% del total	3,3%	31,6%	65,1%	100,0%
Nivel facturación	1	% del total	0,0%	,4%	,4%	,7%
		Residuo corregido	-,3	,6	-,5	
	2	% del total	0,0%	5,2%	1,5%	6,6%
		Residuo corregido	-,8	4,4	-4,0	
	3	% del total	0,0%	10,7%	10,3%	21,0%
		Residuo corregido	-1,6	3,6	-2,9	
	4	% del total	1,8%	11,8%	26,9%	40,6%
		Residuo corregido	,9	-,7	,3	
	5	% del total	,7%	1,8%	7,7%	10,3%
		Residuo corregido	1,2	-1,6	1,1	
	6	% del total	,7%	1,5%	18,5%	20,7%
		Residuo corregido	,1	-4,4	4,2	
Total		% del total	3,3%	31,4%	65,3%	100,0%
Tamaño Empresa (número de empleados)	1	% del total	,4%	22,5%	33,5%	56,4%
		Residuo corregido	-2,8	3,4	-2,3	
	2	% del total	2,2%	8,0%	28,4%	38,5%
		Residuo corregido	1,8	-3,1	2,3	
	3	% del total	,7%	,7%	2,9%	4,4%
		Residuo corregido	2,7	-1,1	,1	
	4	% del total	0,0%	,4%	,4%	,7%
		Residuo corregido	-,3	,6	-,4	
Total		% del total	3,3%	31,6%	65,1%	100,0%

Nota: 1=positiva; 2=negativa; 3=no sabe/no contesta.

Fuente: Elaboración propia.

Tabla 10. Procedimiento de "Brexit y sus implicaciones en las empresas de pesca Marina-Percepción de los Pescadores españoles

			Level of Perception			Total	
			1	2	3		
Nivel facturación	1	% del total	0,0%	1,4%	0,0%	1,4%	
		Residuo corregido	-,3	,7	-,6		
	2	% del total	0,0%	1,4%	1,4%	2,9%	
		Residuo corregido	-,4	-,5	,7		
	3	% del total	1,4%	18,6%	5,7%	25,7%	
		Residuo corregido	-,3	,7	-,5		
	4	% del total	5,7%	34,3%	14,3%	54,3%	
		Residuo corregido	1,2	-,5	-,2		
	5	% del total	0,0%	1,4%	5,7%	7,1%	
		Residuo corregido	-,6	-2,2	2,8		
	6	% del total	0,0%	8,6%	0,0%	8,6%	
		Residuo corregido	-,7	1,9	-1,6		
Total		% del total	7,1%	65,7%	27,1%	100,0%	
Tamaño Empresa (número de empleados)	1	% del total	1,4%	21,1%	11,3%	33,8%	
		Residuo corregido	-,7	-,5	,9		
	2	% del total	5,6%	42,3%	15,5%	63,4%	
		Residuo corregido	,8	,1	-,6		
	3	% del total	0,0%	2,8%	0,0%	2,8%	
		Residuo corregido	-,4	1,0	-,9		
	4	% del total	0,0%	0,0%	0,0%	0,0%	
		Residuo corregido	,0	0,0	,0		
	Total		% del total	7,0%	66,2%	26,8%	100,0%

Nota: 1=más favorable; 2=menos favorable; 3=indiferente.

Fuente: Elaboración propia.

Tabla 11. Procedimiento de “Brexit y sus implicaciones en las empresas de pesca Marina-Percepción Reformulación PER, TACs y Cuotas.

			Level of Perception			Total	
			1	2	3		
Nivel facturación	1	% del total	0,0%	1,3%	0,0%	1,3%	
		Residuo corregido	-,2	-,5	-,6		
	2	% del total	0,0%	1,3%	1,2%	2,5%	
		Residuo corregido	-,4	-,5	,6		
	3	% del total	1,4%	18,6%	5,7%	25,7%	
		Residuo corregido	-,2	,7	-,5		
	4	% del total	4,2%	38,1%	12,3%	54,6%	
		Residuo corregido	1,4	-,7	-,3		
	5	% del total	0,0%	1,8%	7,2%	9,0%	
		Residuo corregido	-,6	-2,2	2,8		
	6	% del total	0,0%	6,9%	0,0%	6,9%	
		Residuo corregido	-,8	2,1	-1,4		
Total		% del total	5,6%	68,0%	26,4%	100,0%	
Tamaño Empresa (número de empleados)	1	% del total	1,7%	23,1%	8,9%	33,7%	
		Residuo corregido	-,6	-,4	,9		
	2	% del total	6,9%	41,6%	14,6%	63,1%	
		Residuo corregido	,8	,1	-,6		
	3	% del total	0,0%	3,2%	0,0%	3,2%	
		Residuo corregido	-,3	1,8	-,8		
	4	% del total	0,0%	0,0%	0,0%	0,0%	
		Residuo corregido	,0	0,0	,0		
	Total		% del total	8,6%	67,9%	23,5%	100,0%

Nota: 1=PER; 2=TAC y cuotas; 3=Otros.

Fuente: Elaboración propia.

Tabla 12. Procedimiento de “Brexit y sus implicaciones en las empresas de pesca Marina-Percepción sobre la flota gallega con pabellón UK

			Level of Perception			Total
			1	2	3	
Nivel facturación	1	% del total	1,4%	0,0%	0,0%	1,4%
		Residuo corregido	,8	-,3	-,7	
	2	% del total	0,0%	1,4%	1,4%	2,9%
		Residuo corregido	-1,7	2,4	,5	
	3	% del total	15,7%	1,4%	8,6%	25,7%
		Residuo corregido	,3	-,3	-,1	
	4	% del total	32,9%	4,3%	17,1%	54,3%
		Residuo corregido	,4	,3	-,5	
	5	% del total	1,4%	0,0%	5,7%	7,1%
		Residuo corregido	-1,8	-,6	2,2	
	6	% del total	7,1%	0,0%	1,4%	8,6%
		Residuo corregido	1,3	-,7	-1,0	
Total		% del total	58,6%	7,1%	34,3%	100,0%
Tamaño Empresa (número de empleados)	1	% del total	15,5%	2,8%	15,5%	33,8%
		Residuo corregido	-1,6	,3	1,5	
	2	% del total	40,8%	4,2%	18,3%	63,4%
		Residuo corregido	1,2	-,2	-1,2	
	3	% del total	2,8%	0,0%	0,0%	2,8%
		Residuo corregido	1,2	-,4	-1,0	
	4	% del total	0,0%	0,0%	0,0%	0,0%
		Residuo corregido	,0	0,0	,0	
Total		% del total	59,2%	7,0%	33,8%	100,0%

Nota: 1=sí; 2=no; 3=no sabe/no contesta.

Fuente: Elaboración propia.

Tabla 13. Procedimiento de “Brexit y sus implicaciones en las empresas de pesca Marina-Percepción Fondo Europeo Marítimo Pesquero

			Level of Perception			Total	
			1	2	3		
Nivel facturación	1	% del total	0,0%	0,0%	1,4%	1,4%	
		Residuo corregido	-,2	-,4	,5		
	2	% del total	0,0%	0,0%	2,9%	2,9%	
		Residuo corregido	-,2	-,6	,7		
	3	% del total	1,4%	4,3%	20,0%	25,7%	
		Residuo corregido	,8	,1	-,5		
	4	% del total	1,4%	8,6%	44,3%	54,3%	
		Residuo corregido	-,1	,0	,0		
	5	% del total	0,0%	0,0%	7,1%	7,1%	
		Residuo corregido	-,4	-1,0	1,1		
	6	% del total	0,0%	2,9%	5,7%	8,6%	
		Residuo corregido	-,4	1,2	-1,0		
Total		% del total	2,9%	15,7%	81,4%	100,0%	
Tamaño Empresa (número de empleados)	1	% del total	1,4%	4,2%	28,2%	33,8%	
		Residuo corregido	,5	-,5	,3		
	2	% del total	1,4%	9,9%	52,1%	63,4%	
		Residuo corregido	-,4	,0	,2		
	3	% del total	0,0%	1,4%	1,4%	2,8%	
		Residuo corregido	-,2	1,4	-1,2		
	4	% del total	0,0%	0,0%	0,0%	0,0%	
		Residuo corregido	,0	0,0	,0		
	Total		% del total	2,8%	15,5%	81,7%	100,0%

Nota: 1=positivamente; 2=negativamente; 3=no sabe/no contesta.

Fuente: Elaboración propia.

Con el objeto de profundizar en el estudio de las percepciones, se planteará un análisis segmentado de la muestra en función de la actividad principal de la empresa, el nivel de facturación y el tamaño de empresa. Las Tablas de Contingencia -Tablas 3 a 13- muestran las frecuencias absolutas (recuento) y relativas (porcentaje del total) y sintetizan las relaciones de dependencia o independencia entre las variables cualitativas nominales o los factores considerados. Seguidamente se procederá a la contrastación estadística de la relación de dependencia para las variables cualitativas, mediante la utilización del contraste estadístico basado en el estadístico Pearson Chi-Square and Likelihood Ratio calculados en base a las diferencias entre las frecuencias observadas y las esperadas de las variables percepciones de la muestra de empresas pesca-acuicultura gallegas y los factores rama de actividad, nivel facturación y tamaño de empresa; asimismo, se ha realizado el Fisher's exact test. Los resultados se resumen en las Tablas 14 a 16.

Tabla 14. Chi Square Statistics Percepción General y Movilidad de Trabajadores

Percepción general implicaciones "Brexit" en la actividad económica de la empresa					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
CNAE	Pearson Chi-Square	14,493	8	,070	
	Likelihood Ratio	13,674	8	,091	
	Fisher's Exact Test				,098
Nivel facturación	Pearson Chi-Square	12,218	10	,271	
	Likelihood Ratio	13,830	10	,181	
	Fisher's Exact Test				,301
Tamaño Empresa	Pearson Chi-Square	30,928	6	,000	
	Likelihood Ratio	12,132	6	,059	
	Fisher's Exact Test				,034
Percepción Proceso Implantación "Brexit"					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
CNAE	Pearson Chi-Square	9,662	8	,290	
	Likelihood Ratio	10,566	8	,228	
	Fisher's Exact Test				,400
Nivel facturación	Pearson Chi-Square	16,599	10	,084	
	Likelihood Ratio	17,058	10	,073	
	Fisher's Exact Test				,098
Tamaño Empresa	Pearson Chi-Square	19,428	6	,003	
	Likelihood Ratio	17,725	6	,007	
	Fisher's Exact Test				,037
Percepción implicaciones Proceso "Brexit" sobre trabajadores comunitarios que estén trabajando actualmente en empresas vinculadas al sector marítimo-pesquero en UK.					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
CNAE	Pearson Chi-Square	36,397	8	,000	
	Likelihood Ratio	23,010	8	,003	
	Fisher's Exact Test				,025
Nivel facturación	Pearson Chi-Square	36,21	10	,000	
	Likelihood Ratio	26,065	10	,004	
	Fisher's Exact Test				,031
Tamaño Empresa	Pearson Chi-Square	4,526	6	,606	
	Likelihood Ratio	4,779	6	,572	
	Fisher's Exact Test				,820
Percepción implicaciones Proceso "Brexit" sobre trabajadores comunitarios que pretendan acceder al mercado laboral en empresas vinculadas al sector marítimo-pesquero en UK.					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
CNAE	Pearson Chi-Square	17,883	8	,022	
	Likelihood Ratio	20,337	8	,009	
	Fisher's Exact Test				,078
Nivel facturación	Pearson Chi-Square	35,001	10	,000	
	Likelihood Ratio	17,951	10	,056	
	Fisher's Exact Test				,029
Tamaño Empresa	Pearson Chi-Square	5,293	6	,507	
	Likelihood Ratio	5,993	6	,424	
	Fisher's Exact Test				,758

Fuente: Elaboración propia.

Tabla 15. Chi Square Statistics. Comercio de Mercancías y Política Exterior

Percepción Comercio Mercancías, implicaciones Proceso "Brexit" sobre España					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
CNAE	Pearson Chi-Square	12,848	8	,117	
	Likelihood Ratio	14,139	8	,078	
	Fisher's Exact Test				,234
Nivel facturación	Pearson Chi-Square	6,457	10	,775	
	Likelihood Ratio	7,453	10	,682	
	Fisher's Exact Test				,913
Tamaño Empresa	Pearson Chi-Square	13,395	6	,037	
	Likelihood Ratio	7,845	6	,250	
	Fisher's Exact Test				,072
Percepción Comercio Mercancías, implicaciones Proceso "Brexit" sobre su empresa					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
CNAE	Pearson Chi-Square	13,219	8	,105	
	Likelihood Ratio	17,527	8	,025	
	Fisher's Exact Test				,290
Nivel facturación	Pearson Chi-Square	8,946	10	,537	
	Likelihood Ratio	10,073	10	,434	
	Fisher's Exact Test				,704
Tamaño Empresa	Pearson Chi-Square	17,985	6	,006	
	Likelihood Ratio	10,786	6	,095	
	Fisher's Exact Test				,020
Percepción Política Exterior Pesquera, implicaciones Proceso "Brexit"					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
CNAE	Pearson Chi-Square	12,353 ^a	8	,136	
	Likelihood Ratio	11,668	8	,167	
	Fisher's Exact Test	275			,198
Nivel facturación	Pearson Chi-Square	48,909	10	,000	
	Likelihood Ratio	52,910	10	,000	
	Fisher's Exact Test				,021
Tamaño Empresa	Pearson Chi-Square	22,25	6	,001	
	Likelihood Ratio	20,744	6	,002	
	Fisher's Exact Test				,035

Fuente: Elaboración propia.

Tabla 16. Chi Square Statistics. Empresas de Pesca Marina

Percepción Empresas Pesca Marina, situación acceso a los recursos					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
Nivel facturación	Pearson Chi-Square	12,345	10	,263	
	Likelihood Ratio	13,752	10	,185	
	Fisher's Exact Test				,413
Tamaño Empresa	Pearson Chi-Square	2,05	4	,727	
	Likelihood Ratio	2,686	4	,612	
	Fisher's Exact Test				,821
Percepción Empresas Pesca Marina, posibilidad reformular E.R, TACs y Sistema Cuotas					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
Nivel facturación	Pearson Chi-Square	13,152	10	,178	
	Likelihood Ratio	12,012	10	,354	
	Fisher's Exact Test				,389
Tamaño Empresa	Pearson Chi-Square	3,268	4	,451	
	Likelihood Ratio	3,895	4	,405	
	Fisher's Exact Test				,457
Percepción Empresas Pesca Marina, situación para flota gallega con pabellón UK					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
Nivel facturación	Pearson Chi-Square	13,665	10	,189	
	Likelihood Ratio	12,659	10	,243	
	Fisher's Exact Test				,296
Tamaño Empresa	Pearson Chi-Square	3,729	4	,444	
	Likelihood Ratio	4,413	4	,353	
	Fisher's Exact Test				,634
Percepción Empresas Pesca Marina, implicaciones Fondo Europeo marítimo Pesquero					
		Value	df	Asymp. Sig. (2 sided)	Exact. Sig. (2 sided)
Nivel facturación	Pearson Chi-Square	3,847	10	,954	
	Likelihood Ratio	5,101	10	,884	
	Fisher's Exact Test		1	,851	,982
Tamaño Empresa	Pearson Chi-Square	2,199	4	,699	
	Likelihood Ratio	1,716	4	,788	
	Fisher's Exact Test				,801

Fuente: Elaboración propia.

El análisis de las frecuencias observadas y marginales de factores permite matizar la percepción general negativa de los encuestados en relación a las posibles implicaciones del "Brexit" sobre la actividad económica de las empresas, ya que ello se ha constatado fundamentalmente para las empresas de Pesca Marina (CNAE 311) y las de comercialización de productos pesqueros (CNAE 4638). En cuanto al factor nivel de facturación, las percepciones negativas se reflejan en mayor medida en empresas de mayor nivel de facturación. El análisis del factor tamaño de empresa, entendida por número de empleados, pone de manifiesto que la percepción mayoritaria negativa se percibe en las empresas de reducido número de trabajadores, característica intrínseca de las empresas en Galicia. Los resultados de las pruebas de Chi-Cuadrado de contraste de la hipótesis nula de independencia llevan a rechazar la hipótesis nula y, por tanto, afirmar que hay asociación entre la percepción general sobre el Brexit y el CNAE para niveles de significación del 10%, aceptando también la existencia de asociación de esta percepción en función del tamaño de empresa. No se percibe sin embargo asociación alguna entre dicha percepción y el nivel de facturación de las empresas y, por tanto, se puede afirmar que la percepción obtenida es independiente del tamaño de empresa, si bien sí existen percepciones estadísticamente diferenciadas en función del factor CNAE y nivel de facturación.

En cuanto al procedimiento de implementación del Brexit, los resultados apuntan a una preferencia mayoritaria a un proceso transitorio y flexible, fundamentalmente para las empresas de pesca marina y de comercialización y niveles de facturación medio y altos. Los resultados del contraste de hipótesis permiten afirmar que dicha percepción es genérica al conjunto de la muestra, únicamente se puede aceptar la hipótesis de existencia de asociación entre dichas percepciones y el tamaño de empresa.

En materia de movilidad de trabajadores comunitarios, de este estudio se deduce que el proceso del Brexit puede tener repercusiones sobre la situación laboral de trabajadores comunitarios que estén trabajando actualmente en empresas vinculadas al sector marítimo pesquero en UK y, en particular, el análisis de factores permite afirmar que dicha percepción -excepto para el sector de acuicultura- se constata en mayor medida en las empresas de pesca y comercialización, no percibiéndose diferencias relevantes por niveles de facturación y tamaño de empresa. Resultados similares se obtienen sobre la percepción del proceso del Brexit y sus implicaciones sobre trabajadores comunitarios que pretendan acceder al mercado laboral en empresas vinculadas al sector marítimo pesquero en UK. Los resultados del contraste de hipótesis corroboran dichos resultados y permiten aceptar la hipótesis de ciertas relaciones diferenciadas en función del CNAE y nivel de facturación.

Asimismo, la percepción de las empresas encuestadas sobre las implicaciones en el comercio de mercancías -tanto en el análisis de la repercusión a nivel país, es decir, repercusión en España y repercusiones a nivel de la empresa-, indican una clara percepción negativa de los encuestados, percepción que se acentúa fundamentalmente para las empresas del CNAE 311 -pesca marina- y 4338 -comercialización-. Sin embargo, a nivel desagregado, los contrastes de hipótesis únicamente permiten detectar un cierto grado de asociación entre las percepciones y el factor tamaño de empresas para niveles de significación del 10%.

El análisis de las percepciones de las empresas encuestadas sobre las implicaciones del Brexit en materia de Política Exterior Pesquera (acuerdos internacionales, presencia en organismos internacionales, ...) pone de manifiesto que la salida de UK supondría una incidencia negativa para todas las ramas de actividad analizadas y de manera más acentuada para las empresas de acuicultura marina. Y mayor percepción negativa para las empresas de menor facturación y menor número de empleados. Los resultados de los contrastes de hipótesis llevan a aceptar la hipótesis de ciertas relaciones estadísticamente significativas y diferenciadas en función del factor nivel de facturación y tamaño de empresa.

En síntesis, el análisis de contingencia detecta en gran medida una percepción general negativa de los encuestados sobre las posibles implicaciones que el proceso del Brexit puede ocasionar a España y a sus empresas. Los resultados de los contrastes de independencia obtenidos permiten concluir que estadísticamente hay evidencia para rechazar la hipótesis nula y aceptar la hipótesis alternativa de relación para el factor nivel de facturación y tamaño de empresa respecto a las percepciones en los casos previamente indicados. Además, los resultados permiten destacar la importancia del factor sector de actividad de la empresa, al constatarse una elevada percepción negativa en las empresas de comercialización de productos pesqueros -CNAE 4638- y, en especial, para las empresas de Pesca Marina -CNAE 311.

Finalmente, en el estudio pormenorizado de las empresas de Pesca Marina, los resultados reflejan que los pescadores españoles (con bandera española) tendrán un escenario mayoritariamente desfavorable en materia de acceso a los recursos, considerando de interés reformular el sistema de TACs y reparto de cuotas y/o el principio de estabilidad relativa. Por su parte, se percibe que el proceso del Brexit puede suponer un cambio negativo para la flota gallega con pabellón UK. En ambos aspectos, no se perciben diferencias en estas cuestiones en cuanto a los factores considerados (tamaño de empresa y nivel de facturación). Tampoco se constata que dichos factores lleven a resultados diferenciados en cuanto a la percepción sobre el Fondo Europeo Marítimo Pesquero. Los contrastes de hipótesis confirman que no se puede rechazar la hipótesis nula de independencia de las percepciones en función de los factores nivel de facturación y tamaño de empresa.

4. CONCLUSIONES

El Brexit puede afectar a la flota española dado que un número significativo de buques está faenando actualmente en aguas británicas. En este trabajo se han analizado las percepciones de las empresas gallegas vinculadas al sector de pesquerías sobre los potenciales efectos del Brexit sobre su actividad económica. De los resultados obtenidos destaca la actitud negativa de los encuestados, aunque se ha detectado un elevado nivel de incertidumbre. En particular, en torno al 30% de los encuestados consideran que el Brexit puede generar consecuencias negativas sobre los trabajadores comunitarios de empresas del sector pesquero en Reino Unido. Un porcentaje algo superior considera que la salida del RU de la UE afectará negativamente al comercio exterior de España. Por otro lado, la mayoría de los encuestados percibe un escenario poco favorable en materia de acceso a los recursos pesqueros. En su opinión y ante este escenario, los encuestados declaran que sería deseable reformular el actual sistema de TACs y reparto de cuotas entre los restantes países miembros tras el Brexit. Asimismo, la mayoría de los encuestados también

consideran que el Brexit tendrá consecuencias negativas sobre la flota gallega que opera con pabellón del Reino Unido.

Los resultados del análisis estadístico muestran una relación entre esa actitud negativa y el nivel de facturación y tamaño de empresa. Asimismo, los resultados permiten destacar la importancia del factor sector de actividad de la empresa en los casos de las empresas de Pesca Marina (CNAE 311) y de Comercialización de productos pesqueros (CNAE 4638) al constatarse una elevada percepción negativa hacia el proceso del Brexit para.

El resultado del estudio permite identificar posibles impactos negativos derivados del procedimiento del Brexit y en el que la característica fundamental es el elevado valor de la incertidumbre, la cual podría afectar en alguna medida a la seguridad jurídica de las empresas encuestadas –empresas gallegas- y, con ello, posiblemente a una reducción de la inversión del sector, con todas las consecuencias que ello generaría para la economía española en general y gallega, en particular.

ACKNOWLEDGEMENTS

The authors wish to acknowledge the financial support received from FEDER and Xunta de Galicia (GRC2014/022) and Ministry of Economy and Competitiveness (ECO2014-52412-R).

REFERENCIAS

- AARON, S., HESS, A.S., HESS, J.R. (2017) Understanding tests of the association of categorical variables: the Pearson chi-square test and Fisher's exact test. *Transfusion* 57(4), 877–879.
- BEWICK, V., CHEEK, L., BALL, J. (2004) Statistics review 8. Qualitative data tests of association. *Critical Care* 8, 46-53.
- Cochrane, K.L. (1999) Complexity in fisheries and limitations in the increasing complexity of fisheries management. *ICES Journal of Marine Science* 56(6), 917-926.
- FISHER, RA. (1922) On the interpretation of χ^2 from contingency tables, and the calculation of P. *J R. Stat Soc* 85, 87-94.
- GARZA-GIL, M.D., AMIGO-DOBAÑO, L., SURÍS-REGUEIRO, J.C., VARELA-LAFUENTE, M. (2015) Perceptions on incentives for compliance with regulation. The case of Spanish fishermen in the Atlantic. *Fisheries Research* 170, 30-38.
- GARZA-GIL, M.D., VARELA-LAFUENTE, M. (2015) The preferences of the Spanish fishermen and their contribution on reform of the European Common Fisheries Policy. *Ocean and Coastal Management* 116, 291-299.
- GELCICH, S., GODOY, N., CASTILLA, J.C., EDWARDS-JONES, G. (2009) Artisanal fishers' perceptions regarding coastal co-management policies in Chile and their potentials to scale-up marine biodiversity conservation. *Ocean and Coastal Management* 52(8), 424-432.
- HATCHER, A., GORDON, D. (2005) Further Investigations into the Factors Affecting Compliance with UK Fishing Quotas. *Land Economics* 81(1), 71-86.
- HATCHER, A., JAFFRY, S., THÉBAUD, O., BENNETT, E. (2000) Normative and Social Influences Affecting Compliance with Fishery Regulations. *Land Economics* 76(3), 448-461.
- IGE (2017) Number of Galician firms according to their main activity. Galician Statistical Institute. www.ige.eu
- JAGERS, S.C., BERLIN, D., JENTOFT, S. (2012) Why comply? Attitudes towards harvest regulations among Swedish fishers. *Marine Policy* 36, 969-976.
- JENTOFT, S. (1989) Fisheries co-management delegating government responsibility to fishermen's organizations. *Marine Policy* 13(2), 137-154.
- JENTOFT, S., MCCAY, B. (1995) User participation in fisheries management: lessons drawn from international experiences. *Marine Policy* 19(3), 227-246.
- KUPERAN, K., SUTINEN, J. (1998) *Limited Dependent and Qualitative Variables in Econometrics*. Cambridge University Press, New York.
- MIKALSEN, KH., JENTOFT, S. (2008) Participatory practices in fisheries across Europe: making stakeholders more responsible. *Marine Policy* 32(2), 169-177.
- O'HAGAN, A., FORSTER, J.J. (2004) *Kendall's Advanced Theory of Statistics, Volume 2B: Bayesian Inference*, 2nd edn. Arnold, London.
- PEARSON, K. (1900) On the Criterion That a Given System of Deviations from the Probable in the Case of a Correlated System of Variables Is Such That It Can Be Reasonably Supposed to Have Arisen from Random Sampling. *Philosophical Magazine Series* 5(50), 157-175.
- PITA, C., PEARCE, G.J., THEODOSSIOU, I. (2010) Stakeholders' participation in the fisheries management decision-making process: Fishers' perception of participation. *Marine Policy* 34, 1093-1102.
- SOBRINO HEREDIA, J.M. (2016) Opinión Jurídica sobre la retirada del RU de la UE y sus posibles consecuencias para el sector pesquero de Galicia. Instituto Universitario de Estudios Europeos Salvador de Maradiaga. A Coruña.
- WARLOUZET, L. (2018) Britain at the Centre of European Co-operation (1948-2016). *Journal of Common Market Studies* 56, 1-16

DO BANKS DISCRIMINATE SMALL COMPANIES IN THE NEGOTIATION OF LOANS? A PRINCIPAL COMPONENT ANALYSIS

JUAN ANTONIO ROMÁN ASO

Facultad de Comunicación y Ciencias Sociales/Universidad San Jorge
Calle Universidad San Jorge, 50830 Villanueva de Gállego/jaroman@usj.es

FERNANDO COCA VILLALBA

Facultad de Comunicación y Ciencias Sociales/Universidad San Jorge,
Calle Universidad San Jorge, 50830 Villanueva de Gállego/fcoca@usj.es

VANESSA MASTRAL FRANKS

Facultad de Comunicación y Ciencias Sociales/Universidad San Jorge
Calle Universidad San Jorge, 50830 Villanueva de Gállego/vmastral@usj.es

IRENE BOCH FRIGOLA

Facultad de Comunicación y Ciencias Sociales/ Universidad San Jorge
Calle Universidad San Jorge, 50830 Villanueva de Gállego/ibosch@usj.es

e-mail Juan Antonio Román Aso: jaroman@usj.es

Resumen

En los últimos años, el colapso económico a gran escala y el proceso de reestructuración del sistema bancario han erosionado gravemente la confianza de las entidades financieras en las pequeñas empresas. Este artículo analiza el panorama actual del acceso al crédito estudiando una muestra de 233 pequeñas empresas españolas con el propósito de determinar si el tamaño y la pertenencia al sector afectan a la negociación de un préstamo, de acuerdo con el fenómeno de asimetría de la información. En primer lugar, proponemos un análisis descriptivo de nuestro conjunto de datos y un Análisis de Componentes Principales para detectar elementos comunes en las respuestas de la encuesta. Se ha encontrado un solo componente que se interpreta como un indicador de las condiciones generales de financiación. Tanto en el análisis descriptivo como en el Análisis de Componentes Principales, se ha determinado que el tamaño es un factor relevante para explicar las diferencias entre empresas.

Palabras clave: Financiación, pequeñas empresas, estadística descriptiva, Análisis de Componentes Principales.

Abstract

In the last years, the large-scale economic collapse and the banking system restructuring process have seriously eroded the trust of financial entities in small businesses. This paper analyses the current panorama of credit access studying a sample of 233 Spanish small companies with the purpose of determining if business size and industry affiliation affect the negotiation of loans, in regards to the information asymmetry phenomenon. To this end, we

firstly propose a descriptive analysis of our dataset and a Principal Component Analysis to detect common elements in the responses of the survey. Only one component is found, and it is interpreted as an indicator of the overall conditions of financing. Both in descriptive analysis and in Principal Component Analysis, it has been found that size is a relevant factor to explain the differences amongst companies.

Key Words: Financing, small businesses, descriptive statistics, Principal Components Analysis.

Eje Temático 7 : Economía y Empresa

1. INTRODUCTION

Nowadays, one can easily find bank publicity on TV, radio or billboards where they try to persuade the customer that they are helping small businesses in the art to progress. Although this promotional strategy of putting the focus on people's welfare is quite reasonable, it is generally accepted that their strategy often differs from that. At this stage, we need to consider why banks are so sceptical about the small companies' projects and their growth.

According to the Central Directory of Business (DIRCE, by its Spanish initials), a 99.8% of companies are freelancers, micro, small or medium companies. In terms of economic weight, these contribute more than 70% of labor force and 61% of the total production. Besides this non-negligible data, these companies, especially those located inside the cities, make life more comfortable and neighbourhoods more attractive to live in.

The recent crisis was characterised by a restructuring of the banking system around the world. Spain was not at all disconnected from this phenomenon and subsequently the transformation of its system was remarkable. The crisis evidenced the existence of huge exposure of some financial entities to Real Estate and to certain toxic risk assets. As a result, numerous entities were forced to merge giving rise to new entities that, in most of the cases, ended up embedded in larger financial groups. The Bailout reached 100 billion € and the Bank of Spain nationalized three entities for €4,751 million. Furthermore, the process of transformation brought a substantial fall in the number of bank branches (45,662 in 2008 to 27,706 in 2017) according to Jimenez and Tejero (2018).

The European Central Bank has kept interest rates at a very low level (even 0%) to provide liquidity to the system and began the purchase of sovereign debt in 2013. Despite the stabilization efforts, the credit to economy has not returned to pre-crisis values.

The problems in the banking system were not exclusively Spanish, although it was one of the countries that has clearly experienced them, and where credit access was drastically restricted. Some IMF data can illustrate this issue. In 2001, the percentage of private credit with respect to GDP was about 95% in Spain, at the end of the decade, the Real Estate bubble had boosted it to 172.4%. In 2017, the last data released showed an important decline to 105.8%. For the EU, this

variable moved from 92.6% to 117,3% between 2001 and 2009, and in 2017 it reached 95.4%. It is easy to distinguish a phase of growth (2001-2009) and other of decline (2009-2017). For Spain, internal factors caused more sever shifts in both phases, as a consequence, the economic recovery is more evident as well. Along these lines, the Survey on the Access to Finance of Enterprises in the Euro Area, stated that Spanish micro, small and medium businesses are those who perceived a greater improvement in the availability of credit, followed by Portuguese and Irish ones.

In summary, micro, small and medium businesses have seriously felt the economic ups and downs and largely suffered the lack of liquidity that hampers investments and does not allow for the implementation of development plans. With the economic recovery, not fully consolidated, it is perceived that they are beginning to grow again, as it can be observed in the Annual Employment Report (CEPYME-Randstad, 2017).

After this brief analysis of the historical background and having in mind that the main objective of this research is determining if business size and industry affect financial conditions, it is convenient to highlight some important contributions to the literature on access to finance for small companies.

Company managers take important decisions every day that help them build strategies in the short and the long term. About the role of access to credit in company success, there is a broad consensus in literature, as we can see in Beck and Demirgüç-Kunt, 2006; Carpenter and Petersen, 2002 , Lee et al., 2015 and Gupta and Gregoriou (2018) among others ¹.

However, the factors that facilitate a better access to credit are a source of debate. Numerous studies point that business size has an influence on the likelihood of getting a credit in good conditions. The theoretical framework in based on the concept of information asymmetry that occurs where one party has more information than the other during a negotiation.

The relationship between business size and loan conditions under the hypothesis of asymmetric information has been a frequent source of academic literature in the last decades. In this context, it is important to mention the seminal contribution of Brewer and Genay (1996). Many works have presented similar evidences like Love and Martínez Pería (2015), Ryan, O'Toole and McCann, (2014) Beck, Demirguc-Kunt and Maksimovic (2005).

Another research line was proposed by Watson and Everett (1996). This paper was intended to determine the existence of a significant relationship between size and failure rate. Along these lines, we highlight the work of El Kalak and Hudson. (2016) or Altman, Sabato, and Wilson (2010) where is analysed the impact of size in risk management.

But, what is the origin of the asymmetry? Masiack et al (2017) point to the fact that micro companies are not legally compelled to publish their annual accounts. This

¹Other academic contributions like Lawless et al. (2015) and Moritz et al. (2015; 2016) are addressed to describe financing patterns for micro, small, medium and large companies. Beck et al (2015) and Masiak et al. (2017) provide two comprehensive analysis of financing among micro companies.

spreads a bad atmosphere of growing mistrust on the part of banks which hinder the access to credit. To cover the risks, banks have different options; they can demand reliable information which increases the borrowing costs or imposes collateral requirements. As they have a better access to the financial information provided by big companies than that of small ones, and they find it more reliable, they will prefer to take the risk of lending to a big company although the size of the loan is greater. As a consequence, the percentage of rejections in loan applications is also significantly greater among micro firms according to the empirical evidence found in Kraemer-Eis et al., (2017).

The information asymmetry is frequently mentioned as a recurring problem in borrower-lender relationships, especially when the capital is demanded by a micro company (Masiack et al. (2017). In this empirical context, high agency costs are considered a serious obstacle in Daskalakis et al. (2013), Heshmati, (2001) and Kraemer-Eis et al., (2016).

Chavis et al. (2011) propose a detailed study of financing patterns described by a dataset of companies. Their results suggest that smaller companies are less willing to trust in banks when applying for loans than in informal sources of financing, but this result changes when firms grow. Then, the authors sustain that the problem of information asymmetry takes place in the survey analysed, but in this case, the lack of confidence takes place in the other way around.

In short, the problem of asymmetric information is commonly associated to business size. Our research is intended to provide new empirical evidence by putting the focus, not only on size, but in industry belonging. Our hypothesis is, the smaller the business, the worse the financial conditions. Additionally, including industry permits us to contrast if third sector businesses suffer from worse financial conditions.

This paper is organized as follows. Section 2 presents the data and methodology. Section 3 displays the main results obtained. Finally, the last section summarizes the main conclusions. Appendix A details the questions included in the survey.

2. DATA AND METHODOLOGY

2.1 DATA

Our data set is provided by Smart Finance, an European project within the framework of the Interreg SUDOE Programme. It was led by Cámara Oficial de Comercio, Industria, Servicios y Navegación de Oviedo.

Its purpose was to promote the entrepreneurial spirit, providing different sources of financing through a platform (<http://es.smartfinanceplatform.eu/>) and promoting the growth of the business ecosystem (entrepreneurs and SMEs) in Southeast Europe. During 2018, 566 surveys were collected in Spain, France and Portugal by partners who took part in this project²

² The list of partners: Cámara Oficial de Comercio, Industria, Servicios y Navegación de Oviedo (España). Consejo de Cámaras Oficiales de Comercio, Industria, Servicios y Navegación de la Comunidad Valenciana (España). Cambra Oficial de Comerç, Indústria, Serveis i Navegació de Barcelona (España). Instituto para la Competitividad Empresarial de la Junta de Castilla y León (España). CCI Nouvelle-Aquitaine (France). Agência Nacional de Inovação, S.A. (Portugal). ANJE-Associação Nacional de Jovens Empresários (Portugal).

As the objective is to generate an indicator of financial conditions and detect the existence of asymmetric information in the negotiation of loans in Spain, we have worked on 233 individual interviews from managers of Spanish companies. All of those interviews correspond to companies that have received a loan during the last year.

In addition, it is important to mention that sampling is devoted to collecting objective facts and subjective opinions, including companies that differ in industry affiliation and size, as proposed in previous literature. In that way, we ensure the representativeness of freelancers, micro, small and medium companies.

Sampling is also addressed to reflecting the economic structure of most of the developed countries all over the globe, that is, a new company profile emerges, smaller and predominantly belonging to the services sector. As stated in the UNCTAD Report (2017) "*The role of the services economy and trade in structural transformation and inclusive development*", the increasing weight of services in national economies has resulted in a business size decline.

Table 1: Classification according to employee size and industry

Employee Size	Micro	44%
	Freelance	12%
	Small	36%
	Medium	8%
Industry	Services	49%
	Primary Activity	2%
	Manufacturing and construction	37%
	Freelances	12%

With respect to the survey design, we have sought to capture objective facts and business managers' perceptions, since we need to compare the differences by groups and determine the existence of asymmetric information. At this first stage, the analysis is mainly descriptive.

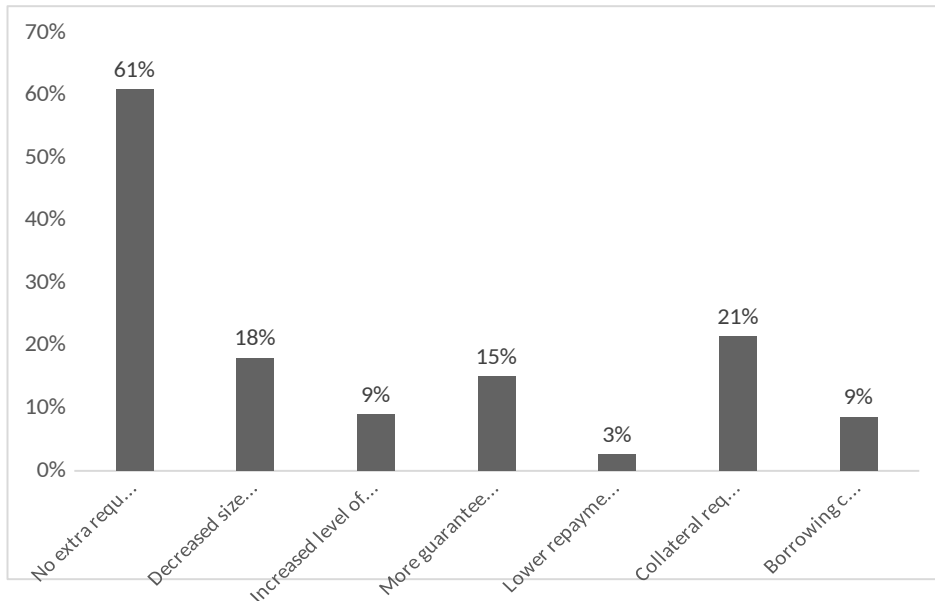
The first question is objective and seeks to know about how long they must wait until receiving an answer from the bank regarding the size and the activity. The interval is between 1 and 6 weeks, and we will consider that the longer the time banks need before an answer, the worse the conditions are.

Table 2: Time until response in weeks

<i>N° of weeks</i>	1	2	3	4	5	6
Average	26.61	30.90	17.60	9.01	2.58	13.30
Freelances	48.28	10.34	24.14	3.45	10.34	3.45
Micro	27.18	29.13	14.56	8.74	1.94	18.45
Small	19.28	40.96	19.28	8.43	1.20	10.84
Medium	22.22	27.78	16.67	22.22	0.00	11.11
Pearson Test for independence between rows and columns 32,3248				p-value=0.006		
Average	26.61	30.90	17.60	9.01	2.58	13.30
Freelances	48.28	10.34	24.14	3.45	10.34	3.45
Primary Activity	40.00	40.00	0.00	20.00	0.00	0.00
Manuf. and construction	32.56	27.91	15.12	6.98	1.16	16.28
Services	15.93	38.05	18.58	11.50	1.77	14.16
Pearson Test for independence between rows and columns 33.7430				p-value=0.004		

We do not appreciate significant differences in the *time until response*, excepting for freelances. Nevertheless, for all groups, the responses are concentrated on the first two weeks. Medium-sized companies do not receive a faster response than that corresponding to smaller or micro companies. With regards to industry, we can note that banks take more time to answer service companies compared to manufacturing ones. This result can be connected to the fact that the services sector is more atomised, and companies generally raise more doubts about their reliability.

The second question is addressed to knowing how many extra requirements (as a proxy of constraints) they have found once the contract is signed, here the respondent had to select one or more from a list of options. As in the previous question, this gathers information about an objective fact.



Note

: SMEs can find more than one constraint. Sum is not equal to 100%.

Figure 1: Incidence of extra requirements

An important percentage of the companies have not experimented changes in their loan conditions. Among those whose conditions have been altered by banks, we highlight two causes that are above the 20%, *less money than agreed* and *collateral requirements*.

The comprehensive survey proposed by the European Central Bank (ECB) and the European Commission (EC) introduces some questions about loan conditions. In the report published in 2009, a majority of companies held that conditions had not changed, ECB (2009). However, some terms had more probability of being altered, amongst those, we can highlight *collateral requirements*, which are in line with our descriptive result. In ECB (2018), in other economic context, companies reported the need for less extra requirements and greater willingness of banks to lend. This is clearly due to the change in the economic context.

Another comprehensive survey of financing for businesses was published by NFIB Research Foundation in 2011, the subpopulation covers North American companies. The questionnaire detects if banks have changed conditions after having signed the loan contract. The percentage of the companies that reported no changes in credit conditions is around 70% but, for those that have suffer changes, the more common causes declared are *more personal guarantees*, *other collateral requirements* and *higher interest rates*. In addition, no relevant differences are perceived amongst group sizes. As we can observe, *collateral requirements* are again a recurring constraint.

To define the variable, we add the number of constraints pointed out by participants, in such a way that a greater value will be considered as an indicator of

worse conditions in credit access. If a participant holds that any extra requirement has been demanded, the variable takes value zero.

Table 3: Number of extra requirements/constraints

<i>Nº of requeriments/cons..</i>	0	1	2	3	4	5
Average	61.80	19.74	7.73	6.87	3.00	0.86
Freelances	72.41	20.69	3.45	3.45	0.00	0.00
Micro	51.46	26.21	9.71	8.74	3.88	0.00
Small	68.67	12.05	7.23	6.02	3.61	2.41
Medium	72.22	16.67	5.56	5.56	0.00	0.00
Pearson Test for independence between rows and columns 15.9271						
						p-value=0.387
Average	61.80	19.74	7.73	6.87	3.00	0.86
Freelances	72.41	20.69	3.45	3.45	0.00	0.00
Primary Activity	60.00	0.00	20.00	0.00	20.00	0.00
Manuf. and construction	62.79	17.44	6.98	8.14	3.49	1.16
Services	58.41	22.12	8.85	7.08	2.65	0.88
Pearson Test for independence between rows and columns 11.444						
						p-value=0.721

The credit conditions once the loan contract is signed does not suffer drastic changes and there are no significant differences if we compare by size or economic activity.

In the ECB survey there is a proposed question to capture individual views and subjective perceptions about the conditions of loans. Delving into the issue, the respondents of our survey were asked if they have perceived an improvement or a worsening with regards to the negotiation capacity on one hand, and the causes of worsening of financial conditions, on the other.

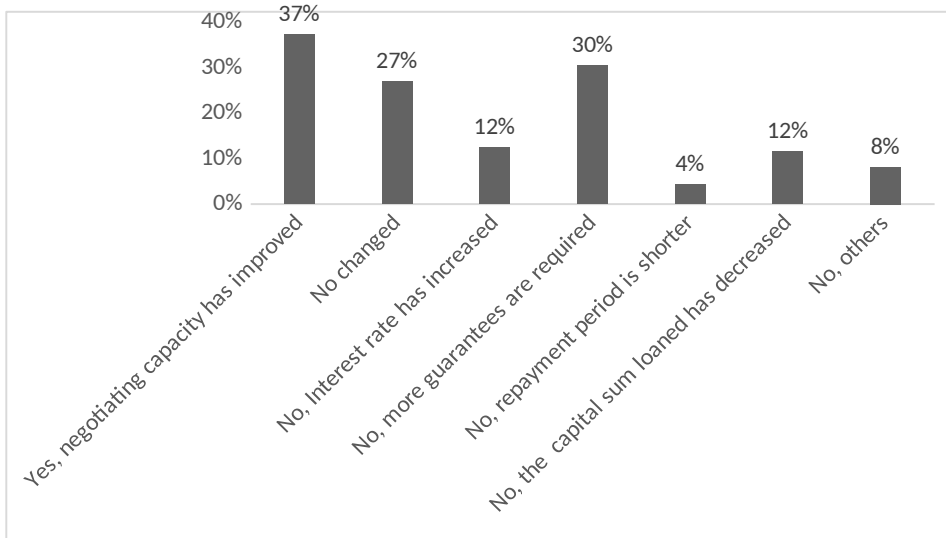


Figure 2: Perception about negotiation

Note: SMEs can find more than one cause of worsening. Sum is not equal to 100%.

We add up the causes of worsening of financial conditions using a similar reasoning than before.

$$\text{Perception} = (Option\ 1 * 0) + (Option\ 2 * 1) + \left[(Option\ 3) * 2 + \frac{\sum_{n=1}^5 n}{5} \right] \quad (1)$$

If a participant believes that the negotiation has improved (*Option 1*), it takes zero and if it has not changed (*Option 2*), the variable takes one. In case someone considers that the negotiation has worsened for one cause or another, the variable will take 2 plus 0,2 (1 reason out of 5), if the participant reports two causes, 2 plus 0,4 and so on.

Table 4: Perception in negotiation

Perception	0	1	2.2	2.4	2.6	2.8
Average	37.34	26.18	21.89	8.58	5.15	0.86
Freelances	10.34	44.83	34.48	6.90	3.45	0.00
Micro	30.10	23.30	31.07	7.77	7.77	0.00
Small	50.60	25.30	9.64	10.84	2.41	1.20
Medium	61.11	16.67	5.56	5.56	5.56	5.56

Pearson Test for independence between rows and columns
42.0029

p-value=0.000

Average	37.34	26.18	21.89	8.58	5.15	0.86
Freelances	10.34	44.83	34.48	6.90	3.45	0.00
Primary Activity	40.00	20.00	40.00	0.00	0.00	0.00
Manuf. and construction	39.53	30.23	16.28	6.98	6.98	0.00
Services	42.48	18.58	22.12	10.62	4.42	1.77
Pearson Test for independence between rows and columns				p-value=0.103		
22.1705						

A stronger perception of improvement in negotiation is clearly evidenced in small and medium companies and not for micro and freelances. Concerning industry, the divergence is not so clear, although an important percentage of manufacturing and service companies seem to perceive an improvement in negotiation.

Following on with the analysis of subjective views, we include a question with the purpose of knowing their perception of bureaucratic red tape associated to loan application³. We present an interval from 1 to 10, where 1 represents less concern in this issue. Not surprisingly, it is so high that most of answers are between 7 and 10.

Table 5: Concern on bureaucratic burden

Bureaucratic burden.	0	1-2	3-4	5-6	7-8	9-10
Average	0.43	9.01	6.87	21.03	40.35	22.32
Freelances	3.45	3.45	6.9	6.9	41.38	37.93
Micro	0	2.91	3.88	19.42	48.54	25.24
Small	0	18.07	8.43	28.92	28.91	15.66
Medium	0	11.11	16.67	16.67	44.44	11.11
Pearson Test for independence between rows and columns				p-value=0.014		
49.3711						
Average	0.43	9.01	6.87	21.03	40.35	22.32
Freelances	3.45	3.45	6.9	6.9	41.38	37.93
Primary Activity	0	0	20	20	40	20
Manuf. and construction	0	15.55	7.77	22.22	42.22	12.22
Services	0	5.26	5.26	24.56	39.82	25.66
Pearson Test for independence between rows and columns				p-value=0.04		

³This question is included in the questionnaire to fast growth companies of technological sector launched by OCDE in 2009.

Small and medium companies as well as manufacturing ones have lower perception of bureaucratic red tape. It can derive from the fact that banks demand more documents to micro and freelances in a clear example of how size affects the distrust shown towards them.

The questions have been designed to obtain in-depth knowledge of financing and to draw a reliable overview (see Annex 1 for more detail). Our first two variables - *time until response*- and -*number of requirements*- are associated with objective questions while the second two variables -*Perception in negotiation*- and -*Concern on bureaucratic burden*- are conditioned by subjective judgements. In terms of size, answers differ significantly in three of four questions, on the other hand, economic activity affects two of four.

The result of this descriptive analysis shows that business size and industry have an important role in achieving successful negotiation of loans. This outcome would be indicative of the existence of asymmetric information that hampers smaller businesses access to financing.

In this line y for getting a more robust empirical evidence, we will define an indicator of financial conditions though the application of the statistical procedure: Principal Component Analysis (PCA, hereafter).

2.2 METHODOLOGY

Our methodological approach is addressed to extract the most important information from the dataset. The variables will be grouped by attempting to lose as little information as possible. In such a way, the clustering will result in an indicator of financial conditions that, by comparing the groups, will permit us to reinforce the empirical evidence about asymmetric information obtained in the previous section.

The procedure operates under the hypothesis of the existence of common factors and as a consequence, we can reduce the survey data in components.

$$y_{ij} = a'_i b_j + e_{ij} \quad i=1, \dots, n \quad j=1, \dots, p \quad (2)$$

Where y_{ij} are the components of the results matrix, a'_i represents the scores for the vectors of parameters derived from the survey b_j , and e_{ij} are the residuals. As mentioned in the previous section, the first element included is the *time until response*. This variable, measured in number of weeks, lies between 1 and 6. The second is composed by the number of constraints that business have found at the time of applying for a credit. In addition, two variables capture subjective views. The first gathers the negative perception in negotiation and the second, the concern with regards to bureaucratic red tape.

Table 6: Descriptive statistics

Variable	Mean	Standard Dev.	Max	Min
Number of weeks	2.699	1.638	1	6
Extra requirements	0.721	1.142	0	5

Perception	1.107	1.004	0	2.8
Bureaucratic burden	6.665	2.421	0	10

The application of PCA enables us to define an indicator of financial behaviour like those proposed in Sarma (2008) or Arora (2014), among others. Once developed the indicator and according to literature, one may argue that size or activity can affect to empirical results since banks show a greater level of trust when they negotiate loans with larger companies or manufacturing ones. To contrast this, we will implement two multivariate tests of means.

In the academic literature, we can find some examples of the application of factorial techniques in financial investigations. Using data from 500 surveys about loan granting of a German bank, Ioniță and Șchiopu (2010) applies PCA to reduce the number of variables from 15 to 7 components. The authors identify which variables have more effect on credit scoring calculation. In this line, Arora (2014) uses this methodology to combine elements for creating an index of financial access, by weighting dimensions with PCA. Other examples of the application of PCA in the area of finance are oriented to portfolio's management (Connor and Korajczyk ;1993 and Ait-Sahalia and Xiu; 2017).

3. RESULTS

3.1. MAIN RESULTS

First of all, it is necessary to know if the sample is adequate for the use of PCA. For that, we implement the Kaiser-Meyer-Olkin Test which takes values between 0 and 1. Small values indicate that PCA may not be used according to the classification proposed by Kaiser (1974). Our overall result 0,6446 overcomes 0.5, considered as the minimum value to accept the use of this technique, although it is far from being adequate.

As stated before, we use PCA instead of other techniques of data reduction because we are looking for a measurable financial indicator. Furthermore, this technique will be developed by using correlations instead of covariances, because our variables are measured on different sensory scales and the outcome would be conditioned to this issue as stated in several academic works like Croux, and Haesbroeck (2000), and Borgognone, Bussi and Hough (2001). The results are displayed in Table 7.

Table 7: Eigenvalues of the correlation matrix

<i>Component</i>	<i>Eigenvalue</i>	<i>Difference</i>	<i>Proportion</i>	<i>Cumulative</i>
<i>Component 1</i>	1.96023	1.09127	0.4901	0.4901
<i>Component 2</i>	0.86896	0.191018	0.2172	0.7073
<i>Component 3</i>	0.67794	0.185083	0.1695	0.8676

Component 4	0.49286	.	0.1232	1.0000
-------------	---------	---	--------	--------

The eigenvalues measure how much variation is explained by each component. Our outcome shows that the variance of the first component represents the 49.01% of the total variance, the second component is the 21.72%, the third is 16.95% and fourth is 12.32%. To determine the number of principal components, we need to put the focus on the eigenvalues which are above one and the percentages of variance explained. Following the first criteria, we should consider the existence of one component, but the second brings us to define three components, as the 85% of variance is exceeded in the third component. An incorrect choice can result in overextraction (more components) or underextraction (less components), in both cases, we will be misinterpreted. To prevent this, Franklin et al. (1995) suggest the Parallel Analysis to determine the significance of loadings for each component through several replications.

The empirical evidence denotes that only the eigenvalue for the first PCA component is larger than the corresponding PA eigenvalue and only one component is above the threshold represented in Figure 3.

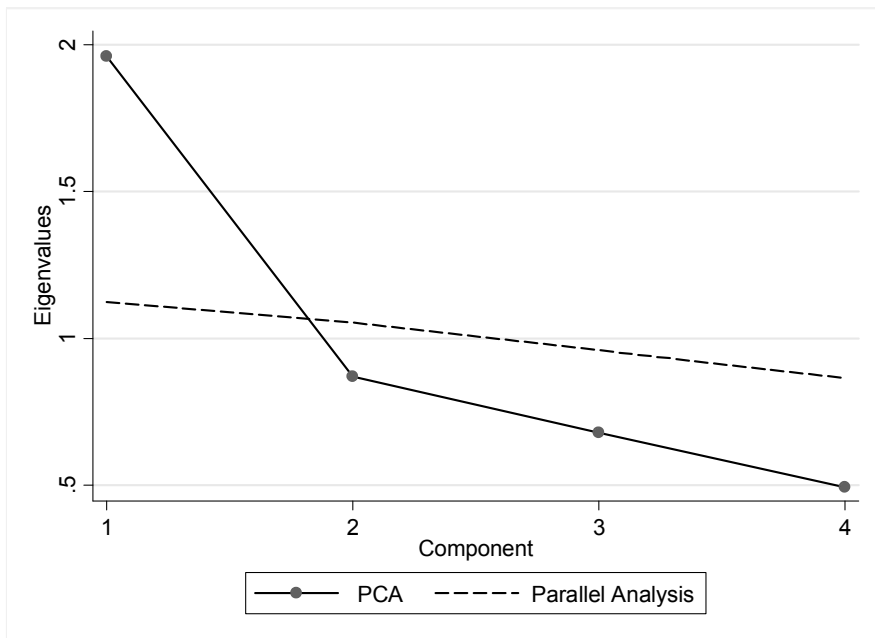


Figure 3: Parallel Analysis

In conclusion, we must choose one component and calculate the corresponding eigenvectors for this component. To that end, we replicate PCA by retaining only

the first component.

Table 8: Eigenvector for component 1

<i>Variable</i>	<i>Component 1</i>	<i>Unexplained</i>
Time until response	0.5026	0.5048
Extra requirements	0.5226	0.4647
Perception	0.4618	0.5819
Bureaucratic burden	0.5109	0.4883

Note: As only one component is retained, part of the variance remains unexplained

Table 10 reports eigenvectors that are commonly called loadings. Here, the linear combination of the variables with the component are described, that is, the relevance of each one in the component. In accordance with this reasoning, the first component has positive loadings of similar size on all variables and therefore, it should be interpreted as an indicator of the overall conditions for credit access. In this point, it is necessary to implement the Wald Test to contrast if loadings of the first component are statistically similar in size. The non-rejection of null hypothesis ($\chi^2(3)=0.71$, p-value = 0.8697) leads us to confirm our interpretation of the first component.

After the number of components has been determined, some empirical contributions rotate the components to strengthen the results obtained in PCA. Using the controversial technique of rotation implies a violation of some properties of PCA, like maximal variance of the first rotated component. When should we use it? Abdi and Williams (2010) provide two simple rules; each variable loads only one factor and there is a significant difference between the eigenvalues which are above one and the “noise”. In our case, these conditions are not satisfied and, rotation will not be desirable.

The application of PCA to reduce our dataset resulted in one component that encompasses all variables. According to empirical evidence, this component can be interpreted like an overall index of financing conditions for freelancers, micro, small and medium-sized companies in Spain

To close this section, we present two contrasts intended to determine if the indicator composed by the loadings of our 4 variables in *Component 1*, has significant differences in employee size and industry.

Table 9: Test of differences

Size	Test for equality = 12.05 P-value = 0.0072
Industry	Test for equality = 2.46

The equality for companies of different sizes must be rejected but, regarding industry, differences are not significant. This empirical evidence denotes that size can be considered as a relevant factor for explaining credit conditions, and according to that observed in our descriptive study, where three variables out of four are conditioned by employee size, and industry affiliation is determinant in two out of four.

Our empirical evidence is in line with Daskalakis et al., (2013) and Lawless et al (2015), Moritz et al. (2016) or Masiak et al. (2017), where we can confirm the effect of size on the likelihood of obtaining financing. In summary, this is indicative of information asymmetry.

3.2. PCA WITH THREE COMPONENTS

In the preceding section, we retain one component only because one eigenvalue is greater than one. The theoretical background of this rule, commonly used in literature to detect the number of components, stems from the definition of eigenvalue, since it measures the magnitude of the effect of the variable in the component. However, the selection of the optimal number of components implies that we need to maximize the variance of the data with the minimum number of components (Lorenzo-Seba, 2013).

As one component only explains the 49% of variance, we propose to enlarge the number of components. With three components, the percentage of explained variance overcomes, the 85%, considered as a threshold. Based on this, we select three components (see Table 7) and the interpretation considerably changes. We present the new results in Table 10:

Table 10: Eigenvector for components

<i>Variable</i>	<i>Component 1</i>	<i>Component 2</i>	<i>Component 3</i>	<i>Unexplained</i>
Time until response	0.5026	-0.5711	-0.2731	0.1708
Extra requirements	0.5226	-0.3579	0.5610	0.14
Perception	0.4618	0.6606	0.4030	0.09263
Bureaucratic burden	0.5109	0.3308	-0.6695	0.08939

For the first component, the loadings do not change with respect to the original scenario, then the interpretation does not change, either. The second principal component has negative loadings for *Time until response* and *Extra requirements* and a positive loading for *Perception* and *Concern on bureaucratic burden*. For that reason, we can state that it seems to distinguish between objective and subjective issues. On the other hand, the third principal component has only a very high negative loading for *Concern on bureaucratic burden*. Now, as more than one

component has been identified, it is possible to represent graphically the orthonormal loadings of our variables in first two components.

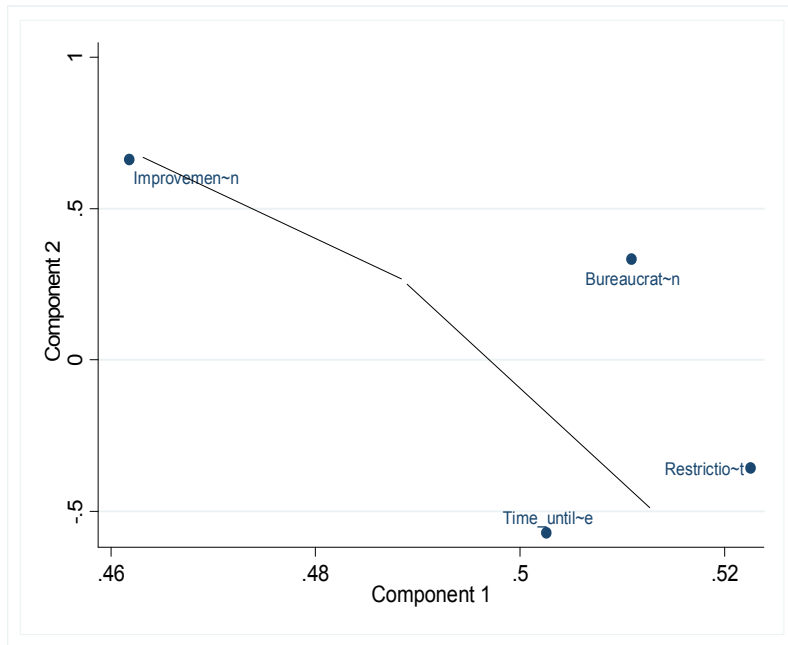


Figure 4: Loadings for Components 1 and 2

The variables *time until response* and *Extra requirements* are more connected to *Component 1*, and *perception* has a clear effect in *Component 2*. In short, if we take into account three components instead of one, the roles of the second component and the third component will differ considerably from that corresponding to *Component 1*.

With this section, we have tried to contrast our main results with those obtained by using three components. Although, the interpretation of second and third components can be interesting, it is more recommendable to retain only one component in accordance to the eigenvalue approach and the previous literature.

4. CONCLUSIONS

The lack of funding in more favourable conditions represents one of the most recurring concerns for companies, since it can be a reliable threat to business continuity. The magnitude of the problem is often elicited if one thinks in their crucial role in the quality of life for citizens and their great contribution to wealth and employment. All this brings us to consider that a new regulation that protects them and guarantees their access to credit in better conditions would be desirable.

In this research, we have contrasted if business size and industry have an impact on the negotiation of loans and consequently, if asymmetric information phenomenon takes place in Spain.

The methodology of this paper has been divided in two sections. The first is a descriptive analysis of financing. The second, PCA, is intended to explore the existence of common factors in the variables.

In the descriptive analysis, we highlighted that banks take more time to give an answer when they are negotiating with sector services enterprises, however we do not observe significant differences by comparing the number of constraints

In addition, there is a clear divergence in the perceptions if we compare companies of different employee size, but this effect softens when we take results by industry. Finally, the bureaucratic red tape is a common source of discontent for most of the companies. To gain competitiveness and market share banks should consider this issue in the future and develop procedures that are less complicated.

The PCA permits us to confirm that only one component should be identified and interpreted like an overall indicator of financing terms. However, following the variance approach, we can select three components and identify a second component that differentiates among objective and subjective answers.

The indicator created from *Component 1* presents significant difference in terms of size but not by activity. In conclusion, our main contribution allows us to hold that company size category affects the overall conditions of financing based on the indicator developed with PCA.

Then, we can confirm that asymmetric information exists and therefore, smaller companies suffer from worse financing conditions because they provide less information to banks, generating an atmosphere of mistrust.

Due to the fact that they are an inexhaustible source of welfare and employment in developed countries, we consider that our empirical evidence should have an implication for policy-makers. Some instruments should be implemented throughout the Official Credit Institute (ICO, by its initial in Spanish). We recommend the improvement of public programs of micro loans or public guarantees focused on the smaller companies.

ACKNOWLEDGEMENTS:

They acknowledge the financial support of the Regional Government of Aragon (ECONOMIUS-J research group, S07_17D). Survey data was provided by Smart Finance. Interreg Sudoe Program, EU (SOE1/P2/E0473).

The usual disclaimer applies. The authors bear the sole responsibility for the analysis and conclusions presented in this article.

REFERENCES

- ABDI H. & WILLIAMS L J. (2010): Principal component analysis. *WIREs Comp Stat*, 2: 433-459. doi: 10.1002/wics.101
- AÏT-SAHALIA, Y., & XIU, D. (2017). Using principal component analysis to estimate a high dimensional factor model with high-frequency data. *Journal of Econometrics*, 201(2), 384-399.
- ALTMAN, E. I., SABATO, G., & WILSON, N. (2010). The value of non-financial information in small and medium-sized enterprise risk management. *Journal of Credit Risk*, 2, 95–127.
- ARORA, R. U. (2014). Access to finance: an empirical analysis. *The European Journal of Development Research*, 26(5), 798-814.
- BECK, T., DEMIRGUC-KUNT, A., & MAKSIMOVIC, V. (2005). Financial and legal constraints to growth: does firm size matter? *Journal of Finance*, 60, 137–177.
- BECK, T. & DEMIRGÜÇ-KUNT, A. (2006) Small and medium-size enterprises: access to finance as a growth constraint, *Journal of Banking & Finance*, 30, 2931–2943.
- BECK, T., LU, L. AND YANG, R. (2015) Finance and growth for microenterprises: evidence from rural China, *World Development*, 67, 38–56.
- BORGOGNONE, M. G., BUSSI, J., & HOUGH, G. (2001). Principal component analysis in sensory analysis: covariance or correlation matrix?. *Food quality and preference*, 12(5-7), 323-326
- BREWER III, E., & GENAY, H. (1996). How are small firms financed? Evidence from small business investment companies. *Economic Perspectives*, 20(6), 2
- CARPENTER, R. E. AND PETERSEN, B. C. (2002) Is the growth of small firms constrained by internal finance? *Review of Economics and Statistics*, 84, 298–309.
- CHAVIS, L. W., KLAPPER, L. F., AND LOVE, I. (2011) The impact of the business environment on young firm financing, *The World Bank Economic Review*, 25, 486–507.
- CONNOR, G. & KORAJCZYK, R.A. (1993): A test for the number of factors in an approximate factor model. *J. Financ. Econ.* 48(4), 1263–1291.
- CROUX, C., & HAESBROECK, G. (2000). Principal component analysis based on robust estimators of the covariance or correlation matrix: influence functions and efficiencies. *Biometrika*, 87(3), 603-618.
- DASKALAKIS, N., JARVIS, R. AND SCHIZAS, E. (2013). Financing practices and preferences for micro and small firms, *Journal of Small Business and Enterprise Development*, 20, 80–101.
- EL KALAK, I., & HUDSON, R. (2016). The effect of size on the failure probabilities of SMEs: An empirical study on the US market using discrete hazard model. *International Review of Financial Analysis*, 43, 135-145
- EUROPEAN COMMISSION (2017): Annual Report on European SMEs. Bruselas.
- EUROPEAN CENTRAL BANK (2009) Survey on the Access to Finance of Enterprises in the Euro Area. Frankfurt am Main.
- EUROPEAN CENTRAL BANK (2018) Survey on the Access to Finance of Enterprises in the Euro Area. Frankfurt am Main.
- FRANKLIN, SCOTT B., GIBSON, DAVID J., ROBERTSON, PHILIP A., POHLMANN, JOHN T. & FRALISH, JAMES S. "Parallel Analysis: a Method for Determining Significant Principal Components." (Feb 1995). *Journal of Vegetation Science* 6: 99-106, 1995.
- GUPTA, J., & GREGORIOU, A. (2018). Impact of market-based finance on SMEs failure. *Economic Modelling*, 69, 13-25.

International Monetary Fund: Less Even Expansion, Rising Trade Tensions. World Economic Outlook.

IONIȚĂ, I., & ȘCHIOPU, D. (2010). Using principal component analysis in loan granting. *Buletinul Universității Petrol-Gaze din Ploiești*, 62(1.2010).

JIMÉNEZ, C. & TEJERO, H. (2018): Cierre de oficinas bancarias y acceso al efectivo en España. *Revista de estabilidad financiera* 34, pp 35-57.

KAISER (1974): An index of factor simplicity". *Psychometrika* 39: 31-36

KRAEMER-EIS, H., LANG, F., TORFS, W., AND GVETADZE, S. (2016) European Small Business Finance Outlook – Dec 2016. EIF Working Paper 2016/37.

KRAEMER-EIS, H., LANG, F., TORFS, W., AND GVETADZE, S. (2017) European Small Business Finance Outlook – June 2017. EIF Working Paper 2017/43.

LAWLESS, M., O'CONNELL, B., AND O'TOOLE, C. (2015) Financial structure and diversification of European firms, *Applied Economics*, 47, 2379–2398.

LEE N., SAMEEN, H. AND COWLING, M. (2015) Access to finance for innovative SMEs since the financial crisis, *Research Policy*, 44, 370–380.

LORENZO-SEVA, U. (2013). How to report the percentage of explained common variance in exploratory factor analysis. Technical Report. Department of Psychology, Universitat Rovira i Virgili, Tarragona.

LOVE, I., MARTÍNEZ PERÍA, M.S., 2015. How bank competition affects firms' access to finance. *World Bank Econ. Rev.* 29 (3), 413–448.

MASIAK, C., BLOCK, J. H., MORITZ, A., LANG, F., & KRAEMER-EIS, H. (2017). Financing micro firms in Europe: An empirical analysis (No. 2017/44). EIF Working Paper.

MORITZ, A., BLOCK, J. H., HEINZ, A. (2016) Financing patterns of European SMEs - an empirical taxonomy, *Venture Capital*, 18, 115–148.

NFIB RESEARCH FOUNDATION (2011): Financing Small Businesses. Small Business and Credit Access. Washington DC.

RESEARCH RANDSTAD-CEPYME (2018): Informe Anual de Empleo en las PYMES. Madrid

RYAN, R.M., O'TOOLE, C.M., MCCANN, F., 2014. Does bank market power affect SME financing constraints? *J. Bank. Financ.* 49, 495–505

Spanish Statistical Office: Central Business Register.

UNCTAD (2017): El papel de la economía y el comercio de servicios en la transformación estructural y el desarrollo inclusivo. Ginebra.

WATSON, J., & EVERETT, J. E. (1996). Do small businesses have high failure rates? Evidence from Australian retailers. *Journal of Small Business Management*, 34, 45–62.

Annex A1: Questionnaire

1. Have you applied for a credit in the last year?
2. Has the bank conceded the loan?
3. How long have you been waiting until receiving an answer? (1-6)
4. Once the contract was signed, Were the conditions maintained?
 - a) Yes.
 - b) No, they offered less money than agreed
 - c) No, they required more interest rate than agreed
 - d) No, they demanded more guarantees required
 - e) No, they proposed a lower repayment period
 - f) No, we were expected to buy other products
 - g) No, they required more borrowing costs
5. Do you believe that the negotiating capacity has improved in the last years?
 - a) Yes.
 - b) No, it has not changed
 - c) No, the interest rate has increased
 - d) No, more guarantees are requested
 - e) No, the repayment period is shorter
 - f) No, the capital sum loaned has decreased
 - g) No, others
6. Please evaluate the bureaucratic burden related with loans applications (1-10)

MAPPING THE FIELD OF INTERNATIONAL COMPETITIVENESS RESEARCH

MARÍA DE LAS MERCEDES CAPOBIANCO URIARTE

Universidad de Almería
mercedescapobianco@ual.es

MARÍA DEL PILAR CASADO BELMONTE

Universidad de Almería
mbelmont@ual.es

GEMA MARÍA MARÍN CARRILLO

Universidad de Almería
gmarint@ual.es

EDUARDO TERÁN YÉPEZ

Universidad de Almería
ety879@inlumine.ual.es

e-mail Mercedes Capobianco Uriarte: mercedescapobianco@ual.es

Resumen

Propósito. El objetivo de este documento es determinar el estado actual de la producción científica con respecto a la "competitividad" de una región comercial en el contexto del comercio internacional a través de un análisis bibliométrico.

Diseño/metodología. Este estudio revisa 2293 documentos publicados sobre competitividad en el contexto internacional obtenidos de Scopus (1983-2017). Aunque existen análisis bibliométricos muy recientes del tema, la metodología aplicada en los mismos en el término búsqueda está sesgada debido al uso de una fórmula de búsqueda simple "competitividad nacional" (Avevedo y otros, 2017) o "competitividad internacional" (Olcyck (2016), limitando la inclusión de artículos al análisis. Para este trabajo, se utilizaron tres combinaciones con operadores lógicos, TITLE-ABS-KEY ("competitividad internacional") OR ("competitividad nacional") OR ("competitividad de exportación"), logrando así abarcar el concepto de competitividad en el contexto del comercio internacional en un sentido más amplio. Se utilizó el programa de visualización Vos-viewer, para la realización de los análisis de coautoría, instituciones académicas investigadoras, revistas científicas y las áreas de conocimiento clasificadas según palabras clave utilizadas.

Resultados. Los resultados muestran que la investigación sobre competitividad en el contexto internacional se encuentra en un período de alta producción relacionada con temas de ciencias sociales, economía, econometría y finanzas y negocios. Los autores y revistas más productivos no son los más citados en competitividad. Solo tres países se destacan con la mayor producción científica sobre este tema. La tendencia de las investigaciones más recientes apunta a áreas de conocimiento en ciencias ambientales. Las áreas geográficas más investigadas en competitividad internacional abarcan especialmente las economías asiáticas, Europa oriental y occidental y los países BRICKS.

Originalidad/valor. El mapeo de las tendencias de investigación mediante el análisis de palabras clave se realizó en detalle, aprovechando que es habitual en este tipo de investigación ubicar el contexto geográfico y el sector productivo donde se realizó el estudio de competitividad.

Palabras clave: competitividad exportadora, competitividad internacional/nacional, análisis bibliométrico.

Abstract

Purpose. The objective of this paper is to determine the current state of scientific production regarding the “competitiveness” of a country, region or commercial area in the context of international trade through bibliometric analysis.

Design/methodology. This study presents a review of 2,293 documents published about competitiveness in the international context from the Scopus database (1983-2017). Two different processing software were used, Vosviewer and Scimat. Although very recent bibliometric analyses of the topic exist, the methodology applied in the term search is restricted due to the use of a single search combination “national competitiveness” or “international competitiveness separately. For this work, three combinations of words with logical operators were used, TITLE-ABS-KEY (“international competitiveness”) OR (“national competitiveness”) OR (“export competitiveness”), thus managing to span the concept of competitiveness in the context of international trade in a broader sense. The analysis of the scientific literature was undertaken according to year of publication, authors, the affiliated academic institution, scientific journals, origin countries, and knowledge areas classified according to keywords used.

Results. The results show that competitiveness research in the international context is in a period of high production related to social sciences topics like, economics, econometrics, finance, and business, management and accounting. The most productive authors and journals are not the most cited on competitiveness. Only three countries stand out with the largest scientific production about this topic. The trend of the most recent research points to knowledge areas in environmental sciences. The most researched geographical areas in international competitiveness encompass the whole world, especially Asian, Western and Eastern European and South African economies.

Originality/value. Mapping the research trends by co-keywords analysis was undertaken in detail, taking advantage that it is usual in this type of researches to place the geographical context and the productive sector where the competitiveness study was carried out.

Key Words: International/national competitiveness, export competitiveness, bibliometric analysis.

Área o eje Temático 7: Economía y empresa

1. INTRODUCCIÓN

En un mundo globalizado, existe una creciente preocupación sobre el crecimiento económico y a menudo se recurre al concepto de competitividad como base para su análisis. En las conclusiones del informe de la Organización para la Cooperación y el Desarrollo Económicos (OCDE) sobre la competitividad en los sectores agrícola y alimentos se indica que “aunque varios artículos investigan empíricamente la competitividad o discuten sus méritos para el bienestar social, como la mejora de los niveles de vida, no hay acuerdo sobre su definición o sobre los métodos exactos para medirla” (Latruffe, 2010). A nivel oficial, el concepto de competitividad se utilizó por primera vez, a inicios de la década de los 80’, en el informe del Tesoro Real (1983) y en el reporte de la Comisión de Competitividad Industrial de los EEUU (1984). En el cuadro 1, se presenta una recopilación de definiciones realizadas por Hong (2008), publicada en su libro sobre la competitividad en el sector turístico. En la misma se muestra la evolución a lo largo de los últimos treinta y cinco años, del concepto de competitividad. Desde la perspectiva del desarrollo económico junto con la perspectiva gubernamental con el fin de aumentar la eficiencia de la estructura productiva nacional, hasta considerar la perspectiva de desarrollo sostenible actual. Por lo que se debería ampliar el concepto de competitividad a "competitividad sostenible", basándose en la idea de que la competitividad actual debe alcanzarse sin comprometer la posibilidad de la competitividad futura (Andreoni y Miola, 2016).

1. Perspectiva Economica	
Casa del Tesoro Real H.M.S. (1983)	‘International competitiveness means the ability of a country’s producers to compete successfully in world markets and with imports in its own domestic market. Competitiveness is generally measured by.....the shares which a country attains in its markets, due allowance being made for its size and stage of development. Competitiveness in this very general sense comes to being synonymous with overall economic performance’.
Scott y Lodge (1985)	‘...refers to a country’s ability to create, produce, distribute and/or service products in international trade while earning rising returns on its resources’.
Fajnylber (1988)	‘Competitiveness is a country’s capacity to sustain and expand its share of international markets and at the same time to improve its people’s standard of living’.
Dechezlepretre y Sato (2014)	‘firm level a business is competitive if it can produce better or cheaper products or services than its domestic or international competitors’.
2. Perspectiva gubernamental	
Presidente de la Comisión de competitividad industrial (1984)	‘Competitiveness is the degree to which a nation can, under free and fair market conditions, produce goods and services that meet the test of international markets while simultaneously maintaining or expanding the real incomes of the citizens’.

Fagerbeg (1988)	'ability of country to realize central economic policy goals, especially growth in income and employment, without running into balance of payments difficulties'.
Krugman (1994)	'Competitiveness is our ability to produce goods and services that meet the test of international competition while our citizens enjoy standard of living that is both rising and sustainable'.
Durand et al. (1998)	'The notion of competitiveness is the broadest approach consists of comparing macroeconomic performance and overall living standards by generally focusing on productivity trends'.
Klinger (2010)	'...firm productivity is in no small part determined by public inputs to firms' production, and the good functioning of the markets in which firms operate. States can either do a very good job or a very bad job at creating the environment in which firms can efficiently obtain inputs and sell their outputs. Moreover, some of the inputs required by firms, such as infrastructure, educated workers, and sanitary / safety certifications are directly provided by the State'.
3. Perspectiva económica y gubernamental + sostenibilidad	
Newall (1992)	'Competitiveness is about producing more a better-quality goods and services that are marketed successfully to consumers at home and abroad. It leads to well-paying jobs and to the generation of resources required to provide and adequate infrastructure of public services and support for the disadvantaged. In other words, competitiveness speaks directly in the issue of whether a nation's economy can provide a high and rising standard of living for our children and grandchildren'.
European Commission (1994)	'...the capacity of business, industries, regions, nations or supernational associations exposed, and remaining exposed to international competition to secure a relatively high return on the factors of production and relatively high employment levels on sustainable basis'.
OECD (2000)	'The competitiveness of a country is essential for the welfare of its citizens. It means output growth and high rates of employment in a sustainable environment'.
European Commission (2009)	'a sustained rise in the standards of living of a nation or region and as low a level of involuntary unemployment as possible'.
Esty y Charnovitz (2013)	'if a company increases profitability by polluting the environment and by generating pollution-related health costs, the overall competitiveness of the nation will be affected. In a similar way, a short-term profitability that is generated, for example by socio-environmental exploitation, could result in a long-term reduction in competitiveness'.
World Competitiveness Center (2014)	'ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people"; or to put it shortly, competitiveness refers to the way in which a country "manages the totality of its resources and competencies to increase the prosperity of its people'.

**.Mulatu
(2016)**

'an economic sector, country or business activity is considered to be competitive when it is able to maintain or improve its capacity to sustain economic growth in an international environment'.

Fuente: Hong S.W.C. (2008) actualizada a 2018.

Cuadro 1. Bibliographic review about competitiveness

En este caso, y como se ha podido apreciar a lo largo de la introducción, este campo de estudio se ha convertido en un tema de interés global, lo cual genera un gran volumen de literatura, sin embargo, tras la revisión literaria y hasta donde llega nuestro conocimiento, solo se han ubicado dos investigaciones recientes que han analizado la dinámica de la investigación mundial sobre competitividad en el ámbito del comercio internacional, Acevedo et al. (2017) y Olczyk (2016), pero ambas realizaron la búsqueda con una fórmula acotada del concepto de competitividad internacional, provocando una muestra final subrepresentada. Es por esto, que el objetivo de este estudio es realizar un análisis cuantitativo acerca de la dinámica de investigación global que permita determinar el estado actual de la producción científica sobre "competitividad" de un país, región o área comercial en el contexto del comercio internacional, a través de un análisis de la producción científica sobre esta temática en el período 1983-2017. Con este fin, se utilizó el método bibliométrico, el cual es utilizado para identificar, organizar y analizar los principales elementos de un tema de investigación. A través de esta metodología es posible detectar los agentes más productivos de un campo de investigación, autores, instituciones o países, lo cual puede guiar a identificar los agentes motores de un campo de estudio.

2. METODOLOGÍA

En este análisis bibliométrico sobre la competitividad en el contexto de comercio internacional, se utilizó la base de datos Scopus, debido a que es la mayor base de datos de citas y resúmenes de bibliografía revisada por pares. Hernández-González et al. (2017), indican que Scopus representa mejor la muestra final de trabajos científicos en un tema de interés. En este trabajo se empleó la fórmula de búsqueda utilizando tres combinaciones de palabras enlazadas con operadores lógicos, TITLE-ABS-KEY ("international competitiveness" OR "national competitiveness" OR "export competitiveness") para lograr abarcar con mayor extensión el concepto de competitividad en el contexto del comercio internacional. La búsqueda se limitó temporalmente al período comprendido entre 1983-2017, haciendo coincidir el año inicial de búsqueda con la primera aparición oficial del concepto competitividad y 2017 es el último año natural completo publicado, para asegurar la reproducción de este trabajo bibliométrico. La búsqueda se limitó a artículos científicos y revisiones bibliográficas, incluyendo documentos de acceso abierto y no abierto. Con esta selección se analizaron 2.293 documentos científicos en total, de los cuales el 93,8% son artículos científicos y el 6,2% son revisiones bibliográficas. Posteriormente, se completó el análisis estructural con mapas de redes utilizando el software de procesamiento VOSviewer (versión 1.6.9., Leiden University, Países Bajos).

3. RESULTADOS Y DISCUSIÓN

3.1. ANÁLISIS BIBLIOMÉTRICO PROPORCIONADO POR SCOPUS

El número de publicación de documentos relacionados con la búsqueda ha aumentado desde 1983 a una tasa de variación anual del 13% hasta 2011, donde alcanzó el punto máximo de publicación anual con 228 documentos (figure 5). Posteriormente disminuyó el ritmo de publicación y en 2017, se ha vuelto a recuperar, pero sin llegar a alcanzar el nivel de publicación de 2011. Las principales revistas científicas que publican en competitividad en el marco internacional son: *Competitiveness Review*, *World Development* y *Applied Economics*, *Actual Problems of Economiccs* y *Science & Public Policy*. Resulta interesante matizar que estas provienen de categorías temáticas muy variadas, desarrollo, economía aplicada, política pública, competitividad, entre otras. Esta diversidad radica en el carácter multidisciplinario del estudio de competitividad en el ámbito del comercio internacional. Los autores con mayor producción científica en cuanto a competitividad en el contexto internacional son Añón J. con 10 documentos, Porter A. L. y Rugman A. M. con 9 documentos publicados. Destaca la producción científica por país, los Estados Unidos con el mayor número de documentos científicos producidos, seguido de Reino Unido y China, teniendo en cuenta la afiliación del primer autor. Destacando principalmente las universidades británicas destacan entre las instituciones académicas con mayor producción científica en competitividad en el ámbito internacional. Los documentos científicos relacionados a la competitividad en el contexto internacional destacan tres áreas de conocimientos que abarcan casi el 60% de la producción científica son las ciencias sociales (21,9%), economía, econometría y finanzas (18,9%) y los negocios, gestión y contabilidad (18,7%). También se distinguen la ingeniería (7,7%), las ciencias ambientales (6,6%) y la agricultura y ciencias biológicas (4,8%).

3.2. ANÁLISIS BIBLIOMÉTRICO PROPORCIONADO POR VOSVIEWER

Aunque Añón, J. es el principal autor en competitividad, trabaja en solitario en la Al-Quds University, Bethlehem, Palestina, por lo que no aparece en la red de relaciones entre autores. En cambio, Porter A.L. que figura en el ranking como el segundo autor más productivo en esta área de conocimiento (figura 1) y pertenece al Georgia Institute of Technology, Atlanta (Estados Unidos). Porter trabaja principalmente en un grupo internacional con Huang, Y. y Liu Y., ambos autores afiliados a la School of Management and Economics, Beijing Institute of Technology (China) y Zhang, Y. de la Faculty of Engineering and Information Technology, University of Technology, Sydney (Australia). En la red de colaboraciones entre países que publican documentos relacionados con la búsqueda (figura 2) existen dos nodos país que destacan, Estados Unidos y Reino Unido, seguidos de Alemania, Australia, China. Aunque también destacan Corea del Sur e India, pertenecen al grupo liderado por Estados Unidos y Alemania. España se encuentra en un grupo distinto de los anteriores, colaborando muy estrechamente entre autores de México, Colombia, Italia y Países Bajos.

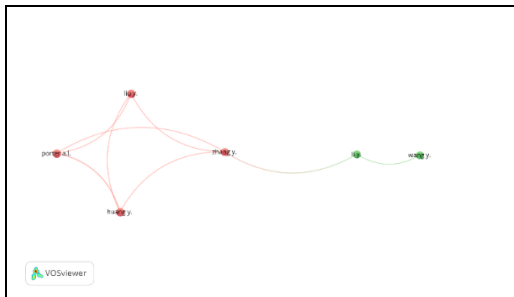


Figura 1. Red relacional de autores con un mínimo de 5 artículos producidos en conjunto.

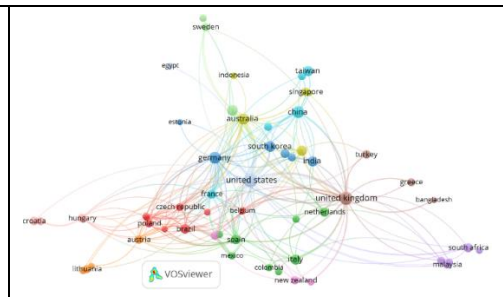


Figura 2. Red relacional de país según la afiliación del primer autor.

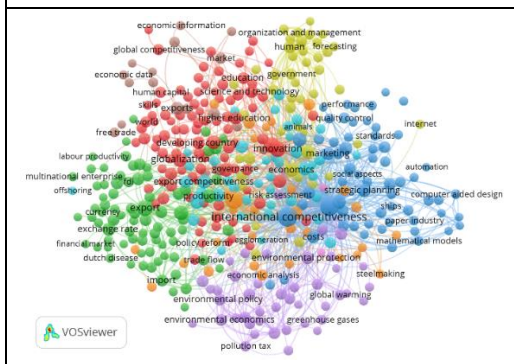


Figura 3. Red de relaciones entre palabras claves asociadas a áreas de conocimiento.

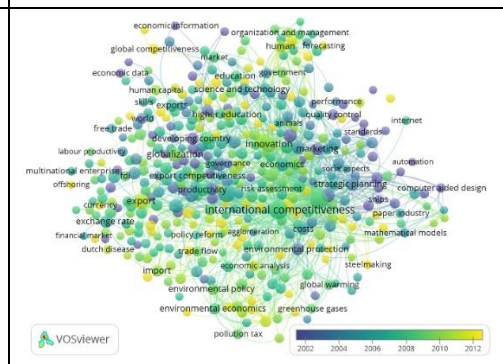


Figura 4. Evolución temporal de la red de relaciones entre palabras claves asociadas a áreas de conocimiento

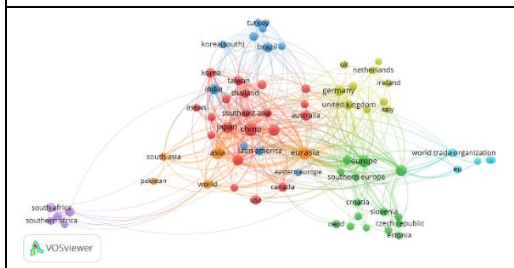


Figura 5. Red de relaciones entre palabras claves asociadas a áreas geográficas estudiadas.

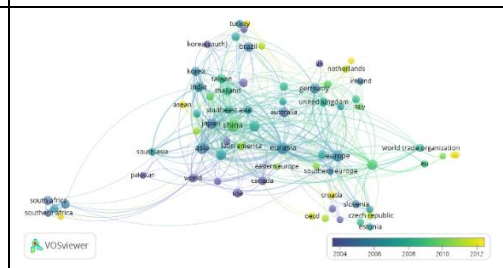


Figura 6. Evolución temporal de la red de relaciones entre palabras claves asociadas a áreas geográficas estudiadas.

En la red inicial de relaciones de palabras claves se identificaron, dos tipos de palabras claves que pertenecen a distintos clusters pero que consideramos interesante apartarlas para su posterior análisis por separado. El grupo de palabras relacionados a áreas de conocimiento por un lado, y por el otro, el grupo de palabras asociadas a distintos países, territorios o áreas comerciales, debido a

que es muy usual en este tipo de investigaciones colocar el contexto geográfico donde se llevó a cabo el estudio de competitividad. En la figura 3 se aislaron solamente las palabras claves relacionadas con áreas de conocimiento y se redistribuyeron formando 2 clusteres extras a los 7 originales. El cluster azul siguió liderado por “international competitiveness”. En la figura 4, las palabras claves en amarillo indican la tendencia de las investigaciones más recientes. Aunque las palabras claves tendencias están distribuidas por toda la red formando parte de distintos clusters, se observa mayor abundancia de palabras claves que marcan tendencia en el cluster formado por el área de conocimiento en ciencias ambientales y relacionadas con la innovación”. Dentro de la red de relaciones entre palabras claves, destacan tres palabras claves correspondientes a sectores productivos, “paper industry”, “steelmaking” y “financial market”. Como aporte innovador a la metodología de cientometría, vádido en el caso de documentos científicos que reflejan el contexto geográfico del estudio sobre competitividad presentado, se muestra en la figura 5, la red de países analizados en su competitividad internacional, junto a la gráfica de su evolución temporal. Donde se detectaron 7 clusteres. El cluster rojo con mayor participación de individuos se caracteriza por estar formado por países o territorios del sudeste asiático (China, Japón, Taiwán, Tailandia, Corea, Australia), el Acuerdo Comercial Regional asociado a estos países, ASEAN, junto a Estados Unidos y Canadá. Los países europeos se encuentran en dos clusters separados, uno agrupa los países europeos continentales (Reino Unido, Países Bajos, Alemania, Irlanda e Italia) y el otro cluster reúne a los países del Sureste europeo (Croacia, Slovenia, Estonia, Rep. Checa) junto con la agrupación de la OCDE. Un cuarto cluster agrupa a territorios sudafricanos. Las tendencias en palabras claves están también distribuidas por toda la red formando parte de distintos clusters, aunque destacan recientemente los documentos basados en competitividad en el contexto internacional en ASEAN y la OECD, y en los países como Croacia y Países Bajos.

4. CONCLUSIONES

El análisis bibliométrico estructural permite obtener un panorama integral sobre la investigación a nivel global de la competitividad, observar las nuevas tendencias en su estudio y permite detectar nuevas líneas de investigación no cubiertas hasta el momento.

El objetivo de este estudio fue revisar los últimos 34 años (1983-2017) de investigación mundial sobre competitividad en el ámbito del comercio internacional. La investigación en esta temática ha crecido exponencialmente desde sus inicios en 1983 hasta 2011, abarcando 3277 documentos científicos. En el año 2017, ha vuelto a crecer la producción de documentos con interés en este tema, pero sin alcanzar la gran producción científica de documentos publicados en 2011. La búsqueda se limitó a artículos científicos y revisiones bibliográficas, incluyendo documentos de acceso abierto y no abierto. Con esta selección se llevó a cabo un análisis bibliométrico con una muestra de 2.295 documentos científicos en total, de los cuales el 93,8% son artículos científicos y el 6,2% son revisiones bibliográficas.

Los documentos científicos relacionados a la competitividad en el contexto internacional destacan tres áreas de conocimientos que abarcan casi el 60% de la producción científica, las ciencias sociales (21,9%), economía, econometría y

finanzas (18,9%) y los negocios, gestión y contabilidad (18,7%). También se distinguen la ingeniería (7,7%), las ciencias ambientales (6,6%) y la agricultura y ciencias biológicas (4,8%). Las revistas que presentan una mayor cantidad de documentos relacionados con esta búsqueda pertenecen básicamente a las ciencias sociales, destacando *Competitiveness Review*, *World Development* y *Applied Economics*. Siendo los autores con mayor producción científica en esta temática, Añón J., Porter A. L. y Rugman A. M.. A nivel de países, destaca Estados Unidos, Reino Unido y China. Las universidades británicas, son las instituciones académicas con mayor producción científica en competitividad en el contexto internacional, seguidas de las universidades asiáticas.

En el análisis estructural destaca Porter A.L., que figura en el ranking como el segundo autor más productivo en esta área de conocimiento perteneciente a Georgia Institute of Technology (Estados Unidos), como el autor que más trabaja internacionalmente, especialmente con universidades del sudeste asiático. En la red de relaciones de instituciones académicas, destacaron las universidades de Bangladesh (Bangladesh Agricultural University, She-e-bangle Agricultural University) y Reino Unido (University of Plymouth). Dentro de las palabras claves destacadas, tres de ellas correspondieron a sectores productivos: papel, acero y financiero. Finalmente, se distinguieron distintas zonas geográficas de interés en la investigación, Sudáfrica, ASEAN, Países Bajos, Croacia y OECD. Además de las herramientas de redes relacionales sería interesante, analizar en más detalles los sectores productivos implicados en los análisis de competitividad internacional, junto con el grupo de países competidores y países mercados, y los productos y servicios analizados, con el fin de detectar áreas de interés no cubiertos aun por la investigación.

Limitaciones. En el inicio de esta investigación se encontró que la competitividad es un término asociado principalmente a la globalización de la economía y al crecimiento económico. Aunque es un concepto ampliamente utilizado, no existe una definición consensuada a nivel internacional y el concepto en su definición ha evolucionado desde su primera utilización a nivel oficial en 1983. Hasta la fecha aparecen publicados en la base de datos Scopus, más de 60,869 publicaciones científicas, por lo que es necesario concretar su contexto con la utilización de palabras combinadas como se ha realizado en este estudio. Dado al alto número de documentos científicos que abordan la competitividad internacional, se seleccionó Scopus por incorporar a su base de datos una mayor cantidad de revistas científicas que Web of Science, aunque algunos artículos se pudieron haber no analizado.

Líneas futuras de investigación. Debido a que el concepto de competitividad está evolucionando constantemente, los estudios más recientes sobre esta área de conocimiento involucran el término competitividad sostenible. Por lo que sería interesante tomar este mismo término como fórmula de búsqueda TITLE-ABS-KEY ("sustainable competitiveness") para analizar bibliométricamente como una nueva línea de conocimiento derivada de la competitividad internacional.

REFERENCIAS

ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD) (2000): The competitiveness of European industry: 1999 Report. In Working Document of the Services of the European Commission; OECD: Paris, France.

- LATRUFFE, L. (2010): *Competitiveness, Productivity and Efficiency in the Agricultural and Agri-Food Sectors*; OECD: Paris, France.
- TESORO REAL (HER MAJESTY'S TREASURY) (1983): *International Competitiveness; Economic Progress Report*; Her Majesty's Treasury: London, UK.
- COMMISSION ON INDUSTRIAL COMPETITIVENESS (1983): *Global Competition: The New Reality*; Government Printing Office: Washington, DC, USA.
- HONG, S. W. C. (2008): *Competitiveness in the tourism sector: a comprehensive approach from Economic and Management points*. Springer science & business media.
- ANDREONI, V.; MIOLA, A. (2016): *Competitiveness and Sustainable Development Goals 2016*; Publications Office 669 of the European Union: Luxembourg.
- SCOTT, B.R.; LODGE, G.C. (1985): U.S. competitiveness in the world economy. *Int. Exec.* 1985, 27, 26.
- FAJNZYLBER F. (1988): International competitiveness: Agreed goal, hard task. *CEPAL Review* 36:7–23.
- DECHEZLEPRETRE A. & SATO M. (2014): *The Impacts of Environmental Regulations on Competitiveness*. LSE Policy Brief. Available online at: http://www.lse.ac.uk/GranthamInstitute/wpcontent/uploads/2014/11/Impacts_of_Environmental_Regulations.pdf
- FAGERBERG, J. (1988): International competitiveness. *Econ. J.* 98, 355–374.
- KRUGMAN, P. (1994) Competitiveness: A dangerous obsession. *Foreign Aff.* 73, 28–46.
- DURAND, M.; MADASCHI, C; TERRIBLE, F (1998): *Trends in OECD Countries' International Competitiveness: The Influence of Emerging Market Economies*; Economics Department Working Papers No. 195; OECD: Paris, France.
- KLINGER B. (2010): *(New) Export Competitiveness*. Mimeo. Center for International Development, Harvard University, February, 2010.
- NEWALL J.E. (1992): The challenge of competitiveness. *The Business Quarterly* 56:94–100.
- EUROPEAN COMMISSION (1994): *Competitiveness Advisory Group. Enhancing European Competitiveness; 2nd Report to the President of the Commission*; European Commission: Luxembourg.
- ESTY, D.C.; CHARNOVITZ, S. (2013): *Environmental Sustainability and Competitiveness: Policy Imperative and Corporate Opportunity*; Harvard Business School: Boston, MA, USA.
- MULATU, A. (2016): On the concept of 'competitiveness' and its usefulness for policy. *Struct. Chang. Econ. Dyn.* 36, 50–62.
- WORLD COMPETITIVENESS CENTER (2014): *IMD World Competitiveness Yearbook 2014*; IMD World Competitiveness Center: Lausanne, Switzerland.
- ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD) (2000): *The competitiveness of European industry: 1999 Report*. In Working Document of the Services of the European Commission; OECD: Paris, France.
- OLCZYK, M. (2016): Bibliometric approach to tracking the concept of international competitiveness. *J. Bus. Econ. Manag.* 2016, 17, 945–959.
- ACEVEDO PRINS, N.M.; JIMÉNEZ GÓMEZ, L.M.; ROJAS LOPEZ, M.D. (2017): Análisis bibliométrico de publicaciones sobre competitividad nacional en la base de datos Scopus. *Espacios*, 8, 1–14.
- HERNÁNDEZ-GONZÁLEZ V., SANS-ROSELL N., JOVÉ-DELTELL M. C.; REVERTER-MASIA J. (2017): Comparison between Web of Science and Scopus, Bibliometric Study of Anatomy and Morphology Journals. *Int. J. Morphol.*, 34(4):1369-1377.



NUEVAS DISTRIBUCIONES DISCRETAS PARA LA MODELIZACIÓN DE DATOS SOBREDISPERSOS: APLICACIÓN A VARIABLES MUNICIPALES

JOSÉ RODRÍGUEZ AVI

Departamento de Estadística e Investigación Operativa/Universidad de Jaén
Despacho B3-057. Campus Universitario de Jaén, 23071. Jaén/jravi@ujaen.es

JULIA RODRÍGUEZ REINOSO

Universidad Complutense de Madrid
C/ Batalla del Salado 14, 2ºA. 28045. Madrid/julia.rodriguez.reinoso@gmail.com

VALENTINA CUEVA LÓPEZ

Departamento de Estadística e Investigación Operativa/Universidad de Jaén
Despacho B3-069. Campus Universitario de Jaén, 23071. Jaén/vcueva@ujaen.es

e-mail José Rodríguez Avi: jravi@ujaen.es

Resumen

En Economía es habitual el uso de datos de conteo en múltiples campos. En la mayoría de ellos los datos no siguen una distribución de Poisson, caracterizada por la igualdad de media y varianza (equidispersión), sino que presentan sobredispersión, es decir, la varianza es mayor que la media. En múltiples situaciones la sobredispersión se debe a una presencia elevada de ceros, sin ser ceros estructurales, junto con valores muy elevados de la variable, y se modelizan estadísticamente mediante distribuciones discretas obtenidas como mixtura de una Poisson. Sin embargo, en otras ocasiones la sobredispersión presenta un perfil diferente, en el que se produce por la presencia de valores bajos de la variable distintos de 0.

En este trabajo presentamos dos distribuciones que responden bien a ambos tipos de sobredispersión. Para el primer caso se presenta una distribución biparamétrica que puede verse como un caso particular de la distribución de Waring y que permite dividir la varianza en tres partes: riesgo, propensión y predisposición. Para el segundo caso se propone una distribución triparamétrica denominada distribución *CTP* y una versión bivalente denominada distribución *CBP*. Como ejemplo de utilización se analizan variables relativas al número de equipamientos por municipio, atendiendo a si su propiedad es privada (solo se hacen si son rentables y presentan una alta probabilidad de cero) o públicos (en los cuales hay otros aspectos diferentes a la rentabilidad y la probabilidad del valor 1 es más elevada). En él se comparan los ajustes con los obtenidos por distribuciones usuales a través de diferentes criterios y se comprueba la versatilidad de los modelos propuestos. Los datos presentados se refieren a equipamientos municipales en Andalucía, y han sido obtenidos a través del Sistema multiterritorial de Andalucía (SIMA) relacionados con centros educativos, sanitarios o culturales, entre otros.

Palabras clave: Datos de conteo, Distribuciones discretas, Modelización estadística, Bondad de Ajuste, Equipamientos municipales.

Área o eje Temático 2: Economía Nacional, Regional y Local

Abstract

In Economy is usual the use of counting data in multiple fields. In most of them the data do not follow a Poisson distribution, characterized by equality of mean and variance (equidispersion), but presented overdispersion, i.e. the variance is greater than the mean. In many situations the overdispersion is due to a high presence of zeros, without to be structural zeros, along with very high values of the variable and they are statistically model using discrete distributions obtained as a mixture of a Poisson. However, on other occasions the overdispersion shows a different shape, which is produced by the presence of low variable values other than zero.

In this paper we present two distributions that respond adequately to both types of overdispersion. For the first case, we propose a biparametric distribution which can be seen as a particular case of the Waring distribution and that allows to split the variance into three components: randomness, liability and proneness. The latter we propose a triparametric model called CTP distribution and a bivariate version called CBP distribution. As application example we analyse variables related to the number of facilities by municipality according to the property is private (which implies that there are only made if they are profitable and have a high probability of zero) or public (in which there are other aspects different from the profitability and the probability of value 1 is higher). The fits are compared with those obtained by usual distributions through different criteria and shall prove the versatility of the proposed models. The data presented refer to municipal facilities in Andalusia, and have been obtained through the multi-territorial system of Andalusia (SIMA) and related to educational, health and cultural facilities, among others.

Key Words: Count data, Discrete distributions, Statistical models, Goodness-of-fit, Municipal facilities.

Thematic area 2: Local, Regional and National Economy

1. INTRODUCCIÓN

Una fuente de datos de conteo relacionados con economía y territorio aparece al considerar el número de equipamientos de diversos tipos por municipio. Estos datos están accesibles en Andalucía a través del Sistema de Información Multiterritorial de Andalucía, (SIMA 2019). Este sistema permite obtener fichas municipales atendiendo a diferentes criterios, y en donde se recogen tanto datos actuales como históricos con epígrafes referentes a entorno físico, demografía, sociedad, economía, mercado de trabajo o hacienda. Dentro de esta base de datos se presentan variables relativas a equipamientos municipales que son variables discretas de conteo de rango infinito y que no pueden modelizarse adecuadamente mediante una distribución de Poisson, ya que la probabilidad de éxito no permanece constante entre municipios. Adicionalmente, todas las variables antes mencionadas cumplen que su varianza es mayor que su media, lo que se conoce como sobredispersión y que puede ser fuerte o moderada.

Aunque pueden considerarse otros factores que afecten a estas variables, los equipamientos pueden separarse entre públicos (sufragados por Ayuntamientos, Diputaciones, Comunidades Autónomas o el Estado) y privados (sufragados por instituciones con ánimo de lucro). Una de las diferencias esenciales entre un equipamiento público y uno privado reside en que la implantación de los segundos está motivada principalmente por la rentabilidad, lo que hará que haya muchos municipios sin ninguna mientras que en los municipios importantes habrá en gran número. Sin embargo, en el caso de equipamientos públicos, el número de equipamientos se suele justificar por otros motivos, ya que no se busca tanto la rentabilidad económica sino otro tipo de rentabilidad: de cohesión territorial, social, política, solidaria e incluso electoral. Esto se traduce en que la frecuencia del cero es más baja – hay menos municipios sin ese tipo de instalaciones – y la moda se destaca más en el 1 u en otros valores bajos, pero distintos de cero, de la variable.

Desde el punto de vista estadístico, esta diferencia se traduce en las distribuciones que pueden proponerse para modelizar estas variables. La sobredispersión se mide mediante el Índice de Agregación, definido como el cociente entre la varianza y la media. La sobredispersión implica pocos valores muy grandes y muchos valores más pequeños de modo que la distribución presenta una gran cola a la derecha. Así, la sobredispersión en el caso de variables que miden el equipamiento privado proporciona distribuciones con alta frecuencia en 0, mayor que la de la distribución de Poisson, y que puede ser descrita mediante el uso de distribuciones obtenidas como mixturas de una Poisson, entre ellas la distribución Binomial Negativa (*NB*), distribución Univariante Generalizada de Waring, *UGW* (Johnson et al, 2005; Dacey, 1972; Xekalaki, 1983), distribución de Poisson Generalizada, *GP* (Consul, 1989) o incluso, con distribuciones infladas de ceros (Czado et al, 2007). Otros modelos usuales son la distribución Com-Poisson (Sellers et al, 2012) o Hyper-Poisson (HP, Bardwell and Crow, 1964 y Sáez-Castillo y Conde-Sánchez, 2013)

Sin embargo, estas distribuciones no son capaces de ajustar el perfil derivado de las frecuencias de equipamientos públicos, en donde la frecuencia de 0 se acerca mucho, o es incluso inferior, a la correspondiente en la Poisson, mientras que el valor en 1 es mucho mayor que el que las distribuciones mencionadas pueden ajustar. Para estos casos proponemos el uso de la distribución *CTP* (Rodríguez-Avi et al, 2004) y de un caso particular, la distribución *CBP* (Rodríguez-Avi et al, 2003a,

Rodríguez-Avi y Olmo-Jiménez, 2017), que sí presentan perfiles que se ajustan con mayor precisión al tipo de distribuciones de frecuencias que aparecen en el caso público.

Este trabajo se estructura de la siguiente forma. En primer lugar, en la Sección 2 se comparan los perfiles y características de las variables de conteo de equipamientos públicos o privados. En la sección 3 se recoge la definición y principales propiedades de las distribuciones *CTP* y *CBP*, así como de una distribución biparamétrica, llamada Extended Bivariate Waring (*EBW*). En la sección 4 se ilustran diferentes perfiles para equipamientos públicos con tres ejemplos de centros escolares en donde se comprueba la versatilidad de las distribuciones *CTP* y *CBP* a la hora de proponer modelos para ese tipo de variables. Finalmente se hace una discusión de los principales resultados obtenidos.

2. EQUIPAMIENTOS PÚBLICOS VERSUS PRIVADOS

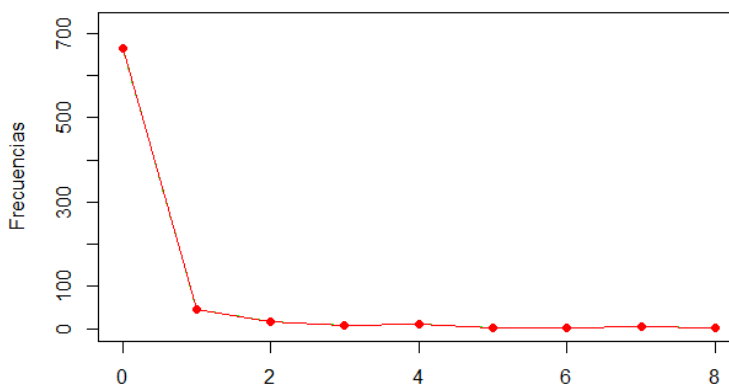
Los equipamientos municipales constituyen un conjunto de variables de conteo que pueden ser utilizados para conocer mejor las actividades y el desarrollo del municipio. Para este estudio nos vamos a centrar en equipamientos municipales en la comunidad autónoma de Andalucía, que consta de 778 entidades municipales repartidas en 8 provincias, con diverso número de municipios por provincia. Estos datos se han obtenido a partir de la información recogida en el Sistema de Información Municipal de Andalucía y accesible desde Internet. Dentro de estos municipios existen múltiples equipamientos, que abarcan diferentes ámbitos: educativo (centros escolares para diferentes edades, desde escuelas infantiles hasta centros de bachillerato o enseñanzas especiales), de salud (consultorios, centros auxiliares, farmacias), culturales (bibliotecas públicas, cines, centros deportivos) o económicos (sucursales bancarias), y que pueden ser de titularidad tanto pública como privada. En todos los casos, estas variables presentan sobredispersión, al tener perfiles asimétricos a la derecha, con mucha frecuencia en los valores bajos de la variable y unos cuantos valores muy elevados. Los equipamientos de titularidad privada suelen caracterizarse por realizarse de acuerdo con condiciones de rentabilidad económica, lo que se traduce en perfiles sobredispersos con alta frecuencia del valor 0 (no hay equipamientos en aquellos municipios muy pequeños o con poco interés económico) mientras en aquellos municipios más rentables el número de equipamientos se eleva (por ejemplo en las capitales de provincia). Un estudio descriptivo de datos de este tipo aparece en la Tabla 1, en donde se muestran la media, varianza, cuartiles, Índice de agregación (I.A) y máximo para las variables:

- TESO2016: Total de centros privados y concertados de ESO por municipio en 2016
- TPrim2016: Total de centros privados y concertados de enseñanza primaria por municipio en 2016
- Hot4y5_16: Número de hoteles de 4 y 5 estrellas por municipio en 2016

Tabla 1. Valores descriptivos para las variables indicadas

	media	varianza	I. A	Q1	Mediana	Q3	máximo
TESO2016	0.608	13.248	21.790	0	0	0	60
TPrim2016	0.677	15.856	23.408	0	0	0	67
Hot4y5_16	0.660	10.585	16.043	0	0	0	54

y el perfil característico de este tipo aparece en la figura 1 en donde se muestran los primeros valores de la variable Hot4y5_16.

**Figura 1.** Número de hoteles de 4 y 5 estrellas. Año 2016

En el caso de equipamientos públicos la causa de su fabricación no es estrictamente económica, sino que la decisión se toma en base a factores políticos, electorales o de cohesión territorial. Esto implica que, aunque no sean rentables desde el punto de vista económico, en la mayoría de los municipios hay un equipamiento de este tipo. Estas variables también son sobredispersas, pero la moda habitualmente viene dada por el valor 1, e incluso en los casos en que el valor modal es 0, la frecuencia de 1 es más elevada que en el caso de los equipamientos privados. En la Tabla 2 mostramos un resumen descriptivo de las variables:

- InfPC16: Centros de educación infantil de 0 a 3 años por municipio en 2016
- Prim2016: Centros de educación primaria por municipio en 2016
- Bac2016: Centros de bachillerato por municipio en 2016

Tabla 2. Valores descriptivos para las variables indicadas

	media	varianza	I. A	Q1	Mediana	Q3	máximo
InfPC2016	0.909	1.882	2.071	0	1	1	17
Prim2016	2.596	41.685	16.055	1	1	2	94
Bach2016	0.779	7.163	9.197	0	0	1	45

En la Figura 2 se muestran los perfiles de las variables anteriores en sus primeros valores, en donde se observan las diferencias con el perfil mostrado en la Figura 1.

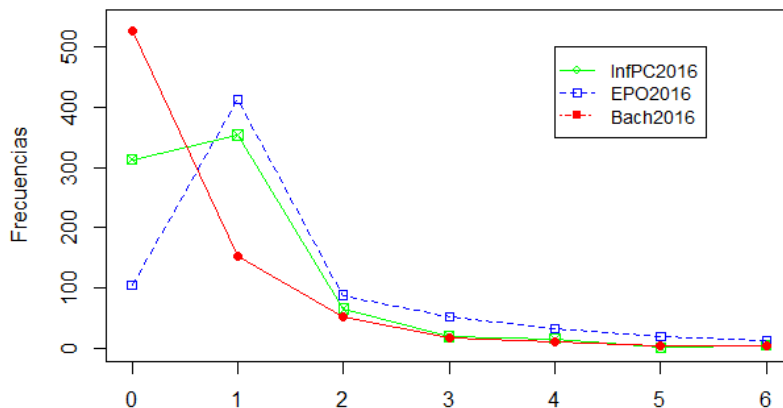


Figura 2. Número de diversos equipamientos educativos. 2016

3. MODELOS DE DISTRIBUCIONES PARA EQUIPAMIENTOS PÚBLICOS

En el caso de sobredispersión y para los perfiles mostrados en la Figura 2, las distribuciones para datos de conteo más habituales como las distribuciones obtenidas a partir de mixturas de la distribución de Poisson, como las distribuciones Binomial Negativa o Univariante Generalizada de Waring, u otras distribuciones relacionadas con la distribución de Poisson no son válidas para modelar adecuadamente esos datos, debido a que la sobredispersión la explican fundamentalmente por el mayor peso de la frecuencia del 0. Sin embargo, esos datos pueden ajustarse adecuadamente por otro tipo de distribuciones, generadas a partir de funciones hipergeométricas con parámetros complejos.

3.1. LA DISTRIBUCIÓN COMPLEX TRIPARAMETRIC PEARSON, CTP

3.1.1 DEFINICIÓN

Esta distribución pertenece a la familia de distribuciones generadas por la función hipergeométrica de Gauss, y se obtiene como solución de la ecuación en diferencias:

$$G(r)f_{r+1} - L(r)f_r = 0 \quad (1)$$

donde $G(r)$ y $L(r)$ son polinomios cuadráticos con coeficientes reales, de forma que $G(r) = (r - \gamma)(r + 1)$ y $L(r)$ tiene las dos raíces complejas conjugadas, es decir,

$$L(r) = (r - (a - ib))(r - (a + ib)). \quad (2)$$

La solución de (1) viene dada en términos de la función ${}_2F_1(a + bi, a - bi; \gamma; 1)$, de manera que la función de masa de probabilidad (fmp) es:

$$P[X = x] = f_0 \frac{(a + ib)_x (a - ib)_x}{(\gamma)_x} \frac{1}{x!}, \quad x = 0, 1, \dots \quad (3)$$

con $(t)_r = \Gamma(t+r)/\Gamma(t)$ el símbolo de Pochhammer, y en donde $a, b \in \mathbb{R}$, $\gamma > \max(0, 2a)$, $i = \sqrt{-1}$ es la unidad imaginaria y la constante de normalización

$$f_0 = P[X = 0] = \frac{\Gamma(\gamma - a - ib)\Gamma(\gamma - a + ib)}{\Gamma(\gamma)\Gamma(\gamma - 2a)}.$$

Es de destacar que cuando los polinomios cuadráticos en (1) tienen dos raíces reales se obtienen, entre otras, las distribuciones Hipergeométrica, Hipergeométrica Inversa, Beta-Pascal, Pólya, Beta-Binomial o distribución Univariante Generalizada de Waring (Rodriguez et al, 2003b)

3.1.2. PROPIEDADES

La distribución *CTP* es una distribución triparamétrica de rango infinito. Entre sus principales propiedades podemos destacar las siguientes:

- Moda: Se alcanza en la parte entera de $[(a - 1)^2 + b^2]/(\gamma - 2a + 1)$, excepto cuando ese valor es un entero, en cuyo caso presenta dos modas consecutivas en ese valor y el siguiente.
- Esperanza

$$E[X] = \frac{a^2 + b^2}{\gamma - 2a - 1}$$

- Varianza

$$Var[X] = \frac{(a^2 + b^2)[(\gamma - a - 1)^2 + b^2]}{(\gamma - 2a - 1)^2(\gamma - 2a - 2)} = E[X] \frac{E[X] + \gamma - 1}{\gamma - 2a - 2}$$

- Momento central de orden 3:

$$\frac{(a^2 + b^2)[4b^2 + (\gamma - 1)^2][b^2 + (\gamma - a - 1)^2]}{(\gamma - 2a - 1)^3 (\gamma - 2a - 2)(\gamma - 2a - 3)}$$

que es positivo, por lo que la distribución es siempre asimétrica a la derecha. En general, para que exista el momento de orden k es necesario que $\gamma - 2a > k$.

- Además, es una distribución que puede ser infra o sobre dispersa en función de los valores de a y γ . Así, si $a < -(\mu + 1)/2$, la distribución es infradispersa; equidisersa si se produce la igualdad y sobredispersa en otro caso. Es de destacar que si a es positivo, la distribución es siempre sobredispersa.

Un estudio más detallado aparece en Rodriguez-Avi et al, 2004, Olmo-Jiménez et al, 2018

3.2. LA DISTRIBUCIÓN CBP

Un caso particular de especial interés aparece cuando en (3) el parámetro a correspondiente a la parte real de las raíces complejas conjugadas es 0. En este caso, la distribución es biparamétrica y se denomina *CBP*(b, γ). Su fmp es:

$$P[X = x] = \frac{\Gamma(\gamma - ib)\Gamma(\gamma + ib)}{\Gamma(\gamma)^2} \frac{(bi)_x (-bi)_x}{(\gamma)_x x!}, \quad x = 0, 1, \dots \quad (4)$$

en donde los parámetros $\gamma, b > 0$.

Es también una distribución de rango infinito y puede emplearse en el mismo contexto que la distribución *CTP*, en el sentido de ser una distribución sobredispersa,

pero cuya probabilidad en 0 es muy próxima a la probabilidad en 0 de la distribución de Poisson. (Rodríguez-Avi et al 2003a). Además, se ha desarrollado un modelo de regresión para datos de conteo asociado a esta distribución (Rodríguez-Avi y Olmo-Jiménez, 2017).

3.2. LA DISTRIBUCIÓN EBW

Es una distribución biparamétrica que se obtiene como solución de la ecuación en diferencias (1) cuando el polinomio $L(r)$ tiene una raíz real doble. Una variable de conteo X sigue una distribución $EBW(\alpha, \gamma)$ u función de masa de probabilidad es:

$$P(X = x) = \frac{\Gamma(\gamma - \alpha)^2}{\Gamma(\alpha)^2 \Gamma(\gamma - 2\alpha)} \frac{\Gamma(\alpha + x)^2}{\Gamma(\gamma + x)} \frac{1}{x!}$$

En donde $\alpha \in \mathbb{R} - \{0\}$, y γ positivo de modo que $\gamma - 2\alpha > 0$. Esta distribución, según sea α presenta dos formas:

- Si $\alpha > 0$ y reparametrizamos $\gamma - 2\alpha = \rho > 0$ es un caso particular biparamétrico de una distribución $UGW(\alpha, \alpha, \rho)$, por lo que se obtiene como una doble mixtura de una distribución de Poisson.
- Si $\alpha < 0$ la distribución $EBW(\alpha, \gamma)$ puede verse como un caso particular de la distribución $CTP(\alpha, 0, \gamma)$.

Un estudio más detallado aparece en Cueva-López et al (2019).

4. EJEMPLOS DE APLICACIÓN

A continuación, vamos a mostrar diferentes ajustes en los que se comprueba la flexibilidad de estas distribuciones para describir datos como los mostrados en la Figura 2. Para ello se realizan ajustes por máxima verosimilitud de las distribuciones mencionadas y se comparan los ajustes obtenidos por medio del criterio de información de Akaike (AIC) y el test chi cuadrado de bondad de ajuste de Pearson. Para los ajustes se emplean funciones del programa R (R Core Team 2019) y también funciones desarrolladas para estas nuevas distribuciones.

4.1. CENTROS PÚBLICOS DE EDUCACIÓN PRIMARIA POR MUNICIPIO

El resumen descriptivo de la variable se muestra en la Tabla 2. Es un ejemplo de variable con alta frecuencia de unos, ya que, por diferentes motivos, el número de municipios sin centro escolar para menores es muy pequeño, mientras que en las grandes ciudades hay una limitación en el número total.

La tabla 3 muestra los resultados de los ajustes en términos de los criterios AIC y bondad de ajuste, en donde los grados de libertad se han calculado tras colapsar las casillas de modo que los valores esperados sean siempre mayores que 5. Como puede verse, el mejor valor del AIC es, con diferencia, el proporcionado por la distribución CTP , que además es la única que proporciona un p-valor alto en el contraste.

Tabla 3. Valores de ajuste para el número de centros de educación primaria 2016

Distribución	AIC	Distancia χ^2	Grados de libertad	p-valor
<i>CTP</i>	2737.1	17.016	12	0.1490
<i>CBP</i>	2912.7	209.847	12	0.0000
<i>EBW</i>	3089.7	419.541	11	0.0000
<i>UGW</i>	3091.6	418.490	10	0.0000
<i>GP</i>	3191.4	509.050	12	0.0000
<i>NB</i>	3307.2	592.299	11	0.0000
<i>ComP</i>	3311.8385	583.4931	11	0.0000
<i>HP</i>	3312.4733	585.6413	11	0.0000

La tabla 4 muestra con detalle los ajustes con las frecuencias esperadas por cada distribución, para aquellas distribuciones con mejor AIC en las Tabla 3, mientras que la Figura 3 muestra gráficamente los ajustes obtenidos para los primeros valores de la variable.

Tabla 4: Frecuencias observadas y esperadas. Centros de primaria, 2016

Nº de centros	Observados	Esperados			
		<i>CTP</i>	<i>CBP</i>	<i>EBW</i>	<i>CTP</i>
0	105	105,3	191,7	229	233,5
1	413	406,9	235,0	183	164,4
2	88	111,5	135,0	121,3	109,4
3	52	47,1	72,9	78	74,1
4	32	25,5	42,1	50,5	51,5
5	19	15,9	26,1	33,4	36,5
6	12	10,8	17,2	22,6	26,4
7	7	7,8	11,9	15,6	19,4
8	12	5,9	8,6	11	14,4
9	6	8,3	6,4	7,9	10,9
10	2		8,7	5,8	8,2
11	5	5,6	7,5	6,3	
12	2			8,6	
13	2	5,6	5,5	8,6	
14	2				5,8
15	1	5,1	6,8	9,1	
16	1				5,6

17-20	6		5,1		
21-22	3	5,1			
23-29	1			6,8	
30-52	4	5,0			
53-94	3	6,0			

En ambos casos se observa como la *CTP* es capaz de modelizar el valor modal del 1, mientras que las distribuciones *GP* y *EBW* sugieren un máximo en 0. La distribución *CBP* también propone un valor máximo en el 1 pero bastante lejos del valor real.

La Tabla 5 muestra los parámetros estimados para cada una de las distribuciones. En todo caso, los parámetros son significativos.

Tabla 5: Parámetros estimados. Centros de primaria, 2016

Parámetros (desviación típica)			
$CTP(a, b, \gamma)$	$CBP(b, \gamma)$	$EBW(a, \rho)$	$GP(\lambda, \theta)$
$\hat{a} = -0,454 (0.027)$	$\hat{b} = 1,532 (0.080)$	$\hat{a} = 2.863 (0.157)$	$\hat{\lambda} = 1,203 (0.045)$
$\hat{b} = 0,572 (0.075)$	$\hat{\gamma} = 1,916 (0.152)$	$\hat{\rho} = 4.533 (0.446)$	$\hat{\theta} = 0.536 (0.018)$
$\hat{\gamma} = 0,138 (0.033)$			

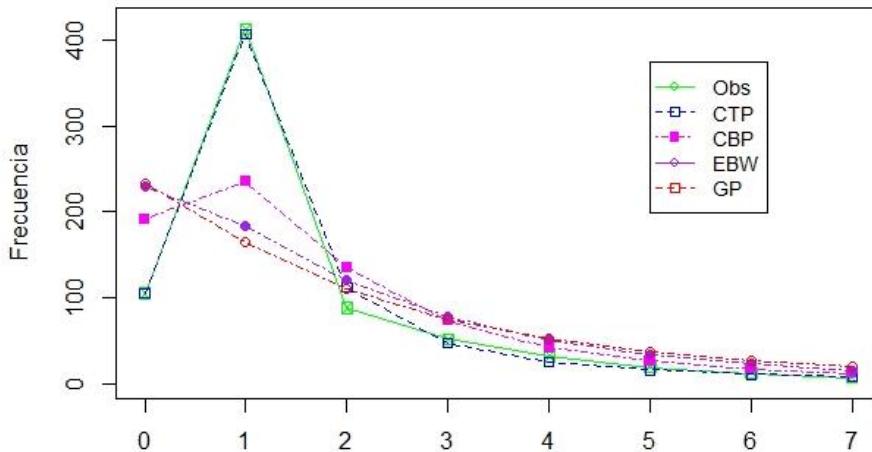


Figura 3. Ajuste de la variable número de centros de primaria. 2016

4.2. CENTROS PÚBLICOS DE EDUCACIÓN INFANTIL DE PRIMER CICLO POR MUNICIPIO

A continuación vamos a modelizar la variable “número de centros de educación infantil de primer ciclo por municipio en Andalucía”. Los parámetros descriptivos aparecen en la Tabla 2 y el perfil en la Figura 2.

En la Tabla 6 se muestran los criterios de comparación entre los ajustes propuestos. Al igual que en el caso anterior el mejor ajuste es el proporcionado por la distribución *CTP*, aunque con menor diferencia en el valor de AIC.

Tabla 6. Valores de ajuste para el número de centros de educación infantil 2016

Distribución	AIC	Distancia χ^2	Grados de libertad	p-valor
<i>CTP</i>	1882.65	5.11	3	0.1642
<i>CBP</i>	1945.29	68.59	4	0.0000
<i>EBW</i>	2003.94	102.45	3	0.0000
<i>UGW</i>	2005.94	102.45	2	0.0000
<i>GP</i>	2017.24	103.00	3	0.0000
<i>NB</i>	2026.34	102.64	3	0.0000
<i>Comp</i>	2047.67	129.20	3	0.0000
<i>HP</i>	2059.26	134.52	3	0.0000

La Tabla 7 muestra las frecuencias observadas y esperadas para los 4 mejores ajustes de la tabla anterior, en donde se aprecia como la frecuencia de 0 es más alta que en el caso anterior, aunque el valor modal sigue siendo el 1.

Tabla 7: Frecuencias observadas y esperadas. Centros de infantil, 2016

Nº de centros	Observados	Esperados			
		<i>CTP</i>	<i>CBP</i>	<i>EBW</i>	<i>CTP</i>
0	313.0	313.2	359.6	370.5	366.5
1	354.0	353.2	256.5	231.5	232.3
2	65.0	67.0	98.0	104.8	107.2
3	19.0	20.8	35.9	42.9	44.2
4	15.0	9.0	14.4	17.0	17.3
5	1	7.4	6.4	11.4	10.5
6	4		7,3		
7	1				
8 -17	6	7.5			

La Figura 4 muestra claridad los ajustes propuestos por cada modelo. En éste también se observa cómo la CTP es capaz de reproducir el perfil de los datos.

Tabla 8: Parámetros estimados. Centros de Educación Infantil, 2016

Parámetros (desviación típica)			
$CTP(a, b, \gamma)$	$CBP(b, \gamma)$	$EBW(a, \rho)$	$GP(\lambda, \theta)$
$\hat{a} = -0,568 (0.045)$	$\hat{b} = 1,827 (0.165)$	$\hat{a} = 4.501 (0.574)$	$\hat{\lambda} = 0.752 (0.034)$
$\hat{b} = 0,674 (0.113)$	$\hat{\gamma} = 4.678 (0.726)$	$\hat{\rho} = 23.427 (5.821)$	$\hat{\theta} = 0.172 (0.022)$
$\hat{\gamma} = 0,689 (0.178)$			

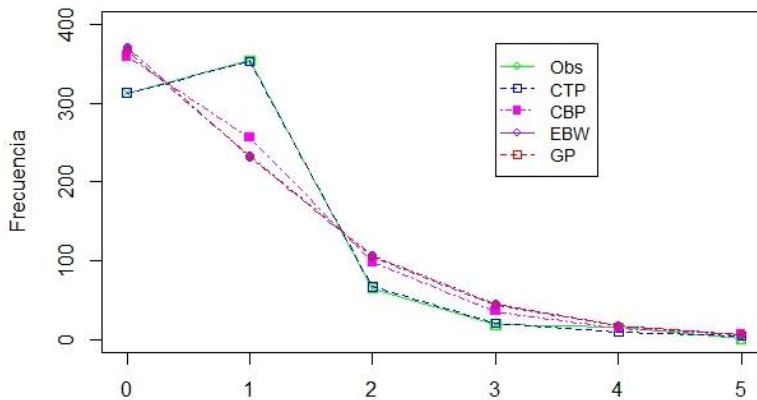


Figura 4. Ajuste de la variable número de centros de Infantil. 2016

4.1. CENTROS PÚBLICOS DE BACHILLERATO POR MUNICIPIO

Ajustamos ahora la variable “número de centros públicos de bachillerato por municipio en Andalucía, año 2016”, cuyos valores descriptivos aparecen en la Tabla 2 y el gráfico de las primeras frecuencias en la Figura 2. La Tabla 9 muestra los criterios de ajuste para las distribuciones consideradas, en donde ahora el mejor ajuste lo proporciona la *CBP*, y en donde la distribución *EWB* también proporciona un ajuste con un p-valor en torno al 9%.

Tabla 9. Valores de ajuste para el número de centros de bachillerato 2016

Distribución	AIC	Distancia χ^2	Grados de libertad	p-valor
<i>CBP</i>	1684.47	2.95	6	0.8154
<i>CTP</i>	1686.47	2.95	5	0.7081
<i>EBW</i>	1694.07	9.65	5	0.0859

<i>UGW</i>	1696.07	9.65	4	0.0498
<i>GP</i>	1719.10	25.48	6	0.0000
<i>NB</i>	1747.47	39.80	6	0.0000
<i>ComP</i>	1901.20	88.77	4	0.0000
<i>HP</i>	1901.31	89.56	4	0.0000

La Tabla 10 muestra los ajustes obtenidos. En este caso se han seleccionado las distribuciones *CBP*, *EBW*, *GP* y *NB*, dado que los ajustes de las distribuciones *CTP* y *UGW* son similares a los dos primeros.

Tabla 10: Frecuencias observadas y esperadas. Centros de Bachillerato, 2016

Nº de centros	Observados	Esperados			
		<i>CBP</i>	<i>EBW</i>	<i>GP</i>	<i>NB</i>
0	527	526,8	535,5	538,1	539,1
1	153	155,5	132,6	117,1	108,3
2	51	44,4	49,8	49,2	51,1
3	16	18,6	23,3	25,9	28,7
4	10	9,7	12,4	15,2	17,4
5	3	5,7	7,3	9,6	11,0
6	4	6,3	7,7	6,4	7,2
7	2			7,5	8,0
8	1	5,2	9,5	8,9	7,2
9	2				
10 - 11	2				
12 - 45	7	5,8			

Aunque en este caso el valor modal está en el 0, sólo la distribución *CBP* acierta la frecuencia del 1, mientras que las otras distribuciones proporcionan estimaciones más bajas, lo que refleja el carácter público del equipamiento. Esto se observa gráficamente en la Figura 5.

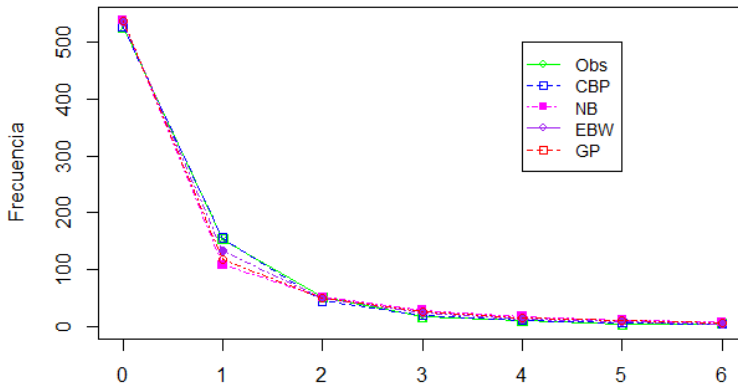


Figura 5. Ajuste de la variable número de centros de Bachillerato. 2016

Los parámetros obtenidos se muestran en la Tabla 11. En este caso se observa que el primer parámetro de la distribución CTP puede considerarse igual a 0.

Tabla 11: Parámetros estimados. Centros de Bachillerato 2016

Parámetros (desviación típica)			
$CTP(a, b, \gamma)$	$CBP(b, \gamma)$	$EBW(a, \rho)$	$GP(\lambda, \theta)$
$\hat{a} = 0.002$ (0.163)	$\hat{b} = 0.676$ (0.054)	$\hat{a} = 1.093$ (0.092)	$\hat{\lambda} = 0.369$ (0.023)
$\hat{b} = 0,677$ (0.116)	$\hat{\gamma} = 1.550$ (0.167)	$\hat{\rho} = 2.644$ (0.363)	$\hat{\theta} = 0.527$ (0.031)
$\hat{\gamma} = 1.558$ (0.575)			

5. DISCUSIÓN

En múltiples aplicaciones de datos de conteo se presentan situaciones sobredispersas, en las cuales la razón de la sobredispersión se produce por una gran presencia de ceros junto con valores extremos, lo que hace disminuir la media y crecer la varianza. En este caso se han propuesto múltiples modelos para su descripción, relacionados con la distribución de Poisson. Este comportamiento se presenta también cuando la variable se refiere a contar el número de equipamientos municipales de propiedad privada, en donde es fácil que no se construyan en los municipios pequeños, poco rentables y sin embargo crezcan proporcionalmente más en aquellos valores mayores. Sin embargo, como hemos comentado, este comportamiento no ocurre en el caso de equipamientos públicos en los que es más frecuente que al menos haya 1 y en contraposición los valores extremos son más acotados que en el caso de los privados.

En ese caso el perfil muestra una mayor presencia de valores 1, en algunos casos con altísima frecuencia. Este tipo de perfil no se modeliza bien con las distribuciones usuales. Como hemos comprobado eso ocurre en el caso de los centros públicos de enseñanza. Este comportamiento aparece repetido en el tiempo y en otros muchos equipamientos públicos no necesariamente docentes que hemos omitido por razón de brevedad.

Aunque proviene de una función hipergeométrica con parámetros complejos, la forma funcional de la distribución permite obtener de manera explícita y exacta tanto la función de masa de probabilidad como los momentos, lo que la hace manejable desde un punto de vista computacional. De esta forma puede ser utilizada fácilmente por parte de los investigadores interesados. Adicionalmente presenta la ventaja de permitir parámetros negativos, lo que provoca su flexibilidad a la hora de describir este tipo de perfiles.

REFERENCIAS

- BARDWELL, G.E., CROW, E.L. (1964): A two-parameter family of hyper-Poisson distributions. *Journal of the American Statistical Association* 9 (305), 133–141.
- CONSUL, P.C. (1989): *Generalized Poisson distributions: Properties and applications*. New York: Marcel Dekker.
- CUEVA-LÓPEZ, V., OLMO-JIMÉNEZ, M. J., RODRÍGUEZ-AVI, J. (2019): EM algorithm for an extension of the Waring distribution. *Computational and Mathematical Methods*. Accepted for publication.
- CZADO C, ERHARDT V, MIN A, WAGNER S (2007) Zero-inflated generalized Poisson models with regression effects on the mean, dispersion and zero-inflation level applied to patent outsourcing rates. *Stat Model* 7(2):125–153
- DACEY, M. F. (1972): A family of discrete probability distributions defined by the generalized hypergeometric series. *Sankhya, Series B* 34:243–250.
- JOHNSON, N. L; KEMP, A. W; KOTZ, S (2005): *Univariate Discrete Distributions*. John Wiley and Sons, Nueva York.
- OLMO-JIMÉNEZ, M. J., RODRÍGUEZ-AVI, J., CUEVA-LÓPEZ, V. (2018) A review of the CTP distribution: a comparison with other over- and underdispersed count data models, *Journal of Statistical Computation and Simulation*, 88:14, 2684-2706
- R CORE TEAM (2019). R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing. Vienna, Austria. <https://www.R-project.org/>
- RODRÍGUEZ-AVI, J, CONDE-SÁNCHEZ A, SÁEZ-CASTILLO A.J. (2003a): A new class of discrete distributions with complex parameters. *Statistical Papers*. 44, 67-88.
- RODRÍGUEZ-AVI, J, CONDE-SÁNCHEZ A, SÁEZ-CASTILLO A.J.; OLMO-JIMÉNEZ, M.J. (2003b): Estimation of Parameters in Gaussian Hypergeometric Distributions. *Communications in Statistics, Theory and Methods*, 32(6): 1101–1118
- RODRÍGUEZ-AVI, J, CONDE-SÁNCHEZ A, SÁEZ-CASTILLO A.J. et al. (2004): A triparametric discrete distribution with complex parameters. *Statistical Papers*. 45, 81-95.
- RODRÍGUEZ-AVI, J, OLMO-JIMÉNEZ M.J. (2017): A regression model for overdispersed data without too many zeros. *Statistical Papers*, 58, 749-773
- SÁEZ-CASTILLO, A. J., CONDE-SÁNCHEZ, A. (2013). A hyper-Poisson regression model for overdispersed and underdispersed count data. *Computational Statistics and Data Analysis* 61, 148-157.
- SELLERS, K.F., BORLE, S., SHMUELI, G. (2012): The COM-Poisson model for count data: a survey of methods and applications. *Applied Stochastic Models in Business and Industry* 28, 104-116.
- SIMA (2018): Sistema de Información Multiterritorial de Andalucía. Instituto de Estadística y Cartografía de Andalucía. Consejería de Economía y Conocimiento. Página web: <https://www.juntadeandalucia.es/institutodeestadisticaycartografia/sima/index2.htm>.
- XEKALAKI, E. (1983): The Univariate Generalized Waring distribution in relation to accident theory: proneness, spells or contagion? *Biometrics* 39, 887–895.

Resúmenes

XXXIII

CONGRESO INTERNACIONAL
DE **ECONOMÍA APLICADA**

Asepelt

2019

economía azul

Universida_{de}Vigo

 **Asepelt**

Asociación Internacional de Economía Aplicada



SOBRECUALIFICACIÓN LABORAL DEL TITULADO UNIVERSITARIO ESPAÑOL

ERNESTO JESUS VERES FERRER

Departamento de Economía Aplicada/Universidad de Valencia
Av. de los Naranjos s/n (46022) Valencia

e-mail: ernesto.veres@uv.es

Resumen

La sobrecualificación de los trabajadores –entendida como la coherencia entre la exigencia formativa de la oferta de empleo y la formación efectiva de los demandantes- es una característica cualitativa del empleo con mayor incidencia sobre su calidad. La práctica inexistencia de información estadística continua sobre ella impide hacer su seguimiento y, por ende, la adaptación de la oferta educativa a las necesidades reales del mundo laboral. En el presente trabajo se analiza la sobrecualificación en España a partir de la única fuente directa sobre la misma, la Encuesta de Inserción Laboral de Titulados Universitarios realizada por el INE, con datos del año 2014 y respecto los egresados en el curso universitario 2009-2010. Se analiza la autopercepción que tienen esos graduados sobre su posible sobrecualificación, combinándola con varias variables recogidas en la encuesta.

La emigración por motivos laborales y por búsqueda de mejores condiciones de vida fue una constante de la población española durante gran parte del siglo pasado, interrumpida en sus últimas décadas. Sin embargo, la crisis nacida en 2007 supuso un cambio de comportamiento de la emigración española al extranjero que, a diferencia de las habituales, supuso la salida de trabajadores con alta cualificación. Este trabajo también incide en aspectos relacionados con la emigración de titulados universitarios españoles al extranjero.

Entre las conclusiones podemos citar: la mayor sobrecualificación de las mujeres; la disparidad de criterios y definición de la sobrecualificación utilizadas por distintos países; la disminución lógica de la sobrecualificación conforme aumenta la edad y la experiencia; la menor tasa de paro de los universitarios españoles que emigraron respecto los que se quedaron en España, quienes además valoran en menor porcentaje que éstos una posible sobrecualificación; y, finalmente, el mayor porcentaje de sobrecualificación de los estudiantes de universidades públicas frente a los de las privadas. Y se concluye con la necesidad de disponer de información continua sobre la sobrecualificación, dada la importancia que tiene esta variable para la correcta asignación de los recursos públicos.

Palabras clave: Sobrecualificación, titulado universitario, inserción laboral, emigración, empleo.

OVERQUALIFICATION OF THE SPANISH UNIVERSITY GRADUATES

Abstract

The overqualification of the workers - understood as the coherence between the formative demand of the job offer and the effective training of the plaintiffs - is a qualitative characteristic of the employment with greater incidence on its quality. The nonexistence of statistical information on it prevents its monitoring and, therefore, the adaptation of the educational offer to the real needs of the working world. In the present work the overqualification in Spain is analyzed from the only direct source on the same, the Survey of Labor Insertion of University Graduates carried out by the INE, with data of the year 2014 and with respect to the graduates in the university course 2009-2010. The self-perception of these graduates about their possible overqualification is also analyzed, combining it with several variables included in the survey.

Emigration for work reasons and search for better living conditions was a constant of the Spanish population for much of the last century, interrupted in recent decades. However, the crisis born in 2007 meant a change in the behavior of Spanish emigration abroad, which, unlike the usual ones, meant the departure of highly qualified workers. This work also incise in aspects related to the emigration of Spanish university graduates abroad.

Among the conclusions we can mention: the higher overqualification of women; the disparity of criteria and definition of overqualification used by different countries; the logical decrease in overqualification as age and experience increase; the lower rate of unemployment among Spanish university students who emigrated compared to those who remained in Spain, who also value in a lower percentage than these a possible overqualification; and, finally, the highest percentage of overqualification of public university students compared to those of private universities. And it concludes with the need to have continuous information on overqualification, given the importance of this variable for the correct allocation of public resources.

Key Words: Overqualification, university degree, labor insertion, emigration, employment

Eje Temático 1 : Economía Internacional

MIGRACIÓN EN CHILE. EL CASO DEL PERÚ. 2005-2014

PLANCK BARAHONA U

Departamento de Industria y Negocios/Facultad Ingeniería/Universidad de Atacama
Avenida Copayapu 485/planck.barahona@uda.cl

ERNESTO VERES F.

Departamento Economía Aplicada/Facultad Economía/Universidad de Valencia
Avenida de los Naranjos/Código postal: 460222

Resumen

El objetivo de este trabajo es determinar las variables asociadas al peso que la inmigración peruana tiene en el conjunto de la inmigración total en Chile para el período 2005-2014. Se ha considerado como variable endógena, el porcentaje de peruanos a los que se les concede Permiso de permanencia definitiva respecto el total concedidas. Como variables exógenas Ratios Chile-Perú de las distintas variables macroeconómicas esto es; Índice de desarrollo Humano (IDH), el PIB per cápita y el gasto en educación como porcentaje del PIB. De acuerdo a la naturaleza de los datos se ha utilizado el modelo de Regresión lineal Múltiple con introducción de variables por pasos. Los resultados pusieron de manifiesto que, contrariamente a lo esperado, a mayor diferencia entre el PIB per capita de Chile y Perú, a favor de Chile, disminuye el peso relativo de los permisos dados a peruanos. En relación al ratio IDH se encontró que un incremento de esta variable a favor de Chile aumenta el flujo migratorio. Por otro lado, un menor presupuesto en educación de Chile, disminuye el flujo migratorio de ciudadanos peruanos.

Palabras clave: flujo migratorio, índice de desarrollo humano, PIB per cápita, Perú.

Abstract

The objective of this paper is to determine the variables associated to Peruvian migration in Chile for the period 2005-2014. The percentage of Peruvians who are granted Permit of permanent permanence with respect to the total granted has been considered as an endogenous variable. As exogenous variables, different macroeconomic variables that is; Human Development Index (HDI), GDP per capita and spending on education as a percentage of GDP. According to the nature of the data, the Multiple Linear Regression model has been used with the introduction of step variables. The results showed that, contrary to expectations, the greater difference between the per capita GDP of Chile and Peru, in favor of Chile, decreases the relative weight of the permits given to Peruvians. In relation to the IDH, it was found that an increase in this variable in favor of Chile increases the migratory flow. On the other hand, a lower education budget in Chile decreases the migratory flow of Peruvian citizens.

Key Words: migration, human development Index, GDP per capita, Peru.

Eje Temático 1 : Economía Internacional

MODELO PREDICTIVO DEL GASTO HOSPITALARIO EN PACIENTES CON DIABETES MELLITUS TIPO II EN UN HOSPITAL DE REFERENCIA EN COLOMBIA

JAVIER LEONARDO GONZÁLEZ RODRÍGUEZ

Escuela de Administración/Línea de Investigación en Administración en Salud/Universidad del Rosario/Calle 12C # 6-25 Bogotá DC Colombia 111711/www.urosario.edu.co

ISABEL BARRACHINA MARTÍNEZ

Centro de Investigación en Economía y Gestión de la Salud CIEGS/Universidad Politécnica de Valencia Camino de Vera, s/n – Edificio 7 J 3ª planta – 46002 Valencia España/ciegs@upv.edu

OLGA LUCÍA PINZÓN ESPITIA

Escuela de Administración /Línea de Investigación en Administración en Salud /Universidad del Rosario/Calle 12C # 6-25 Bogotá DC Colombia 111711/www.urosario.edu.co

e-mail Javier Leonardo González Rodríguez: javier.gonzalez@urosario.edu.co

Resumen

La diabetes Mellitus Tipo II, es una de las enfermedades crónicas con mayor impacto en el gasto sanitario. Además de sus graves complicaciones como la falla renal crónica y la retinopatía diabética, suelen asociarse otras comorbilidades que incrementan el riesgo clínico y la polifarmacia correspondiente.

Objetivo: Diseñar un modelo de gestión de riesgos económicos y epidemiológicos a partir del análisis de prevalencia por género, diagnóstico y costos hospitalarios asociados, de la Diabetes Tipo II y sus comorbilidades en Colombia.

Metodología: A partir de los datos de hospitalización y costes asociados del Hospital Universitario Mederi de Bogotá para los años 2017-2018. Se realiza un estudio descriptivo transversal de costos por tipología. Se analizan las diferencias estadísticamente significativas de estancias y costes medios por género, morbilidad y diagnósticos.

Resultados: El Hospital Mederi tuvo un total de 41.113 egresos en 2017 y 45.605 en 2018 con un promedio de estancia 6.8 en 2017 y 6.4 en 2018. Los pacientes diabéticos suponen aproximadamente el 25% y presentan una estancia media de 5 días. Se observan diferencias significativas de género en la estancia media. El gasto total estimado para pacientes diabéticos, con y sin comorbilidades asociadas, fue de \$ US 2.204.860 (30,1%) para 2017 y de \$ US 2.192.365 (27,2%) para 2018. Aproximadamente, el 40% de los ingresos se deben a 20 diagnósticos principales que originan un 30% del coste total.

Las principales comorbilidades asociadas a la diabetes, son: Infección de vías Urinarias, Hipertensión arterial, Insuficiencia cardiaca y Enfermedad Isquémica Coronaria.

Conclusiones: El modelo de gestión de riesgos se basa en el estudio del gasto en servicios sanitarios ocasionados por la diabetes y sus comorbilidades, éste impacta significativamente en el presupuesto de los servicios de salud, siendo el gasto farmacéutico el de mayor peso relativo. El gasto en hombres es mayor que en mujeres.

Palabras clave: Innovación, empresas, barreras a la innovación, competitividad, disposición a innovar, políticas públicas de I + D, Extremadura.

Abstract

It is commonly recognized that innovation is essential for the growth and well-being of economies. Companies, as agents of innovation systems, play a fundamental role in the innovative activity of economies. Nevertheless, the existence of barriers to innovation are translated into a low willingness to innovate by companies despite being an important element of competitiveness.

The objective of this study is to analyze the characteristics of companies in the Extremadura region (Spain) based on the perceptions they have about these two variables: *willingness to innovate* and *assessing innovation as an essential element of competitiveness*. These two perceptions are fundamental when deciding to innovate. It also influences the perception of government intervention to encourage innovation and the type of actions that would be demanded by companies to be encouraged to innovate or continue carrying out innovative activities.

In order to reach this objective, we elaborate an *ad hoc* questionnaire focused mainly on variables related to innovation and other additional aspects. We contacted a representative sample of companies of the Autonomous Community of Extremadura.

First, companies are classified based on two perception variables: *willingness to innovate* and *competitiveness*, allowing to distinguish 4 differentiated profiles. Then, companies are characterized based on a series of variables as size; activity sector; innovation and types of innovation; export activity; obstacles to innovation perceived; and what types of public actions in order to boost innovation are demanded by the firms.

The results are compared and discussed for two data waves (2011 and 2013). The profiles obtained relate especially to different obstacles to innovation perceived and different public actions demanded. As a practical implication, it is considered that this characterization can be useful in the design of regional public policies to stimulate innovation.

Key Words: Innovation, companies, barriers to innovation, competitiveness, willingness to innovate, R&D public policies, Extremadura region.

Eje Temático 2 : Economía Nacional, Regional y Local

CHILD CARE AND GENDER ROLE ATTITUDES IN SPAIN FROM A SPATIAL PERSPECTIVE

JOSÉ-MARÍA MONTERO

DHEP/Facultad de Ciencias Jurídicas y Sociales de Toledo/Universidad de Castilla la Mancha
Cobertizo San Pedro Mártir s/n, 45071 Toledo, España/jose.mlorenzo@uclm.es

MARÍA DE LOS ÁNGELES MEDINA

Departamento de Estadística y Ciencia de los Datos/Facultad de Estudios Estadísticos/Universidad
Complutense de Madrid/Cobertizo San Pedro Mártir s/n, 45071 Toledo, España/amedina@ucm.es

GEMA FERNÁNDEZ-AVILÉS

DHEP/Facultad de Ciencias Jurídicas y Sociales de Toledo/Universidad de Castilla la Mancha
Cobertizo San Pedro Mártir s/n, 45071 Toledo, España/gemafaviles@uclm.es

e-mail José-María Montero: jose.mlorenzo@uclm.es

Resumen

Este estudio se centra en la distribución del uso del tiempo que las madres y los padres dedican a las tareas relativas al cuidado de los hijos en España, donde actualmente hay un amplio debate sobre la baja participación de los padres en este tipo de tareas. Sobre la base del índice de disimilitud, se analiza si la participación está o no espacialmente correlacionada a escala provincial y si se detecta algún tipo de patrón en la participación de los padres. La información utilizada procede de la Encuesta del Uso del Tiempo en España 2009-2010. Tras una rigurosa depuración de la misma, la base de datos final utilizada contiene 1.878 hogares con niños cuyos padres son heterosexuales. Los resultados obtenidos indican que (i) la participación masculina está todavía lejos de la femenina, (ii) la distribución por actividades que padres y madres llevan a cabo del tiempo que dedican al cuidado de los hijos es similar y (iii) en general, no se detecta autocorrelación espacial ni en el tiempo que los padres dedican al cuidado de hijos ni en el índice de disimilitud.

Palabras clave: Uso del tiempo, cuidado de niños, género, índice de disimilitud, autocorrelación espacial.

Abstract

This study focusses on the distribution of the time dedicated by mothers and fathers to child care activities in Spain, where currently exists a great debate about the low participation of fathers in child care. Based on the dissimilarity index, we analyze whether or not participation is spatially correlated across the Spanish provinces and whether patterns of father participation can be found. The data were provided by the Time-Use Survey conducted by the Spanish Statistics Office in 2009-2010, and the final database consists of 1,878 heterosexual households with children. Results indicate that (i) male participation in child care is still far from

female participation, (ii) the way both men and women distribute their child care time among child care activities is certainly similar and (iii) in general, there is no spatial autocorrelation either in the time men spend on child care or on the index of dissimilarity.

Key Words: time use, child care, gender, dissimilarity index, spatial autocorrelation.

Eje Temático 6 : Economía Social, Cooperación y Desarrollo



RENTABILIDAD DE LA SANIDAD PRIVADA ESPAÑOLA DESDE UNA PERSPECTIVA DE GÉNERO Y EL DESARROLLO DE PRÁCTICAS DE RESPONSABILIDAD SOCIAL CORPORATIVA. UN ESTUDIO POR COMUNIDADES AUTÓNOMAS

MARÍA DEL CARMEN VALLS MARTÍNEZ

Departamento de Economía y Empresa/Universidad de Almería
La Cañada de San Urbano s/n 04120 Almería/mcvalls@ual.es

SALVADOR CRUZ RAMBAUD

Departamento de Economía y Empresa/Universidad de Almería
La Cañada de San Urbano s/n 04120 Almería/scruz@ual.es

ISABEL MARÍA PARRA OLLER

Departamento de Economía y Empresa/Universidad de Almería
La Cañada de San Urbano s/n 04120 Almería/ipo244@ual.es

e-mail María del Carmen Valls Martínez: mcvalls@ual.es

Resumen

Este estudio valora la relación e influencia en los hospitales privados españoles de la emisión de informes de responsabilidad social corporativa, el género de la dirección y la ubicación geográfica dentro del territorio español, sobre la rentabilidad. El análisis empírico se realizó con una muestra de 104 hospitales, con datos referidos a 2015, aplicando tanto análisis univariante, a través de contrastes de medias y correlaciones, como multivariante, empleando regresión lineal múltiple. Encontramos una relación significativa y negativa entre la difusión de informes de RSC y la rentabilidad, así como una relación positiva y significativa entre la dirección ejercida por mujeres y la rentabilidad, pero ninguna de estas relaciones es causal. Por el contrario, sí existe causalidad entre la ubicación en la Comunidad de Madrid y Andalucía con la rentabilidad, siendo la primera negativa y la segunda positiva.

Palabras clave: Hospitales privados, Rentabilidad, Género, Responsabilidad Social Corporativa, Tamaño.

Abstract

This study assesses the relationship and influence in Spanish private hospitals of the publication of corporate social responsibility reports, gender management and geographical location within Spanish territory, on profitability. The empirical analysis was performed on a sample of 104 hospitals, with data referred to 2015, by applying both univariate analysis,

through contrasts of means and correlations, and multivariate, by using multiple linear regression. We found a significant and negative relationship between the publication of CSR reports and profitability, as well as a positive and significant relationship between the management exercised by women and profitability, but none of these relationships is causal. On the contrary, there is causality between the location in the Community of Madrid and Andalusia with profitability, being the first negative and the second positive.

Key Words: Private hospitals, Profitability, Gender, Corporate Social Responsibility, Size.

Eje Temático 2 : Economía Nacional, Regional y Local

LA PRESENCIA DE MUJERES EN EL CONSEJO DE ADMINISTRACIÓN Y SU IMPACTO EN EL DESEMPEÑO FINANCIERO. EVIDENCIA EN LAS COMPAÑÍAS DEL IBEX-35

MARÍA DEL CARMEN VALLS MARTÍNEZ

Departamento de Economía y Empresa/Universidad de Almería
La Cañada de San Urbano s/n 04120 Almería/mcvalls@ual.es

SALVADOR CRUZ RAMBAUD

Departamento de Economía y Empresa/Universidad de Almería
La Cañada de San Urbano s/n 04120 Almería/scruz@ual.es

ISABEL MARÍA PARRA OLLER

Departamento de Economía y Empresa/Universidad de Almería
La Cañada de San Urbano s/n 04120 Almería/ipo244@ual.es

e-mail María del Carmen Valls Martínez: mcvalls@ual.es

Resumen

La Comisión Europea propuso que los países miembros desarrollasen su propia legislación sobre gobierno corporativo para incrementar el número de mujeres en los consejos de administración, con el objetivo de promover la igualdad de género en los procesos de toma de decisiones. Esto ha provocado diversas opiniones controvertidas, lo que ha llevado a explorar argumentos económicos que apoyen estas iniciativas legales. Para arrojar luz sobre dicho tema, este estudio analiza la influencia de un mayor porcentaje de mujeres en el consejo de administración sobre el desempeño financiero, considerando las compañías incluidas en el índice español IBEX-35 durante un período de 15 años: 2003-2017. Para ello, usamos un modelo de regresión con variables instrumentales en dos etapas, que nos permite tratar los problemas de endogeneidad y de causalidad recíproca. Además, estudiamos la influencia de la ley de igualdad obligatoria sobre la presencia de mujeres en los consejos de administración, usando la metodología de datos de panel. Los resultados de este estudio muestran que un mayor número de mujeres en los consejos de administración está positivamente relacionado con un desempeño financiero más alto. Además, como se esperaba, la ley de género obligatoria impulsó la proporción de mujeres en los consejos de administración. En consecuencia, además de argumentos éticos, existe una razón económica para promover legislación de género.

Palabras clave: Consejo de administración, Gobierno corporativo, Diversidad de género, Desempeño financiero, Legislación sobre género.

Abstract

The European Commission has proposed that country-members develop their national self-regulation and governance initiatives to increase the number of women on corporate boards with the aim of promoting gender equality in the processes of decision-making. This has provoked some controversial opinions, which has led to explore economic arguments supporting these legal initiatives. So as to shed light on the topic, this study analyzes the influence of a higher percentage of women in the firm board on financial performance by considering the companies included in the index of the Spanish Stock Exchange IBEX35 for a fifteen-year period: 2003-2017. To do that, we use a two-stage instrumental variables regression to address endogeneity and reverse causality problems. Moreover, we study the influence of a mandatory law on female presence on company boards by using a panel data methodology. The findings of this study show that the increasing number of women on boards is positively related to a higher financial performance. Moreover, as expected, the gender mandatory law boosts the female proportion in the councils. Consequently, there exists a business case to promote mandatory gender legislation, as well as ethical arguments.

Key Words: Board of directors, Corporate governance, Gender diversity, Financial performance, Gender legislation.

Eje Temático 3 : Economía del Sector Público. Administración y Gobernanza

RELACIÓN ENTRE LA DIVERSIDAD DE GÉNERO EN EL CONSEJO DE ADMINISTRACIÓN DE LAS EMPRESAS Y LA RESPONSABILIDAD SOCIAL CORPORATIVA

MARÍA DEL CARMEN VALLS MARTÍNEZ

Departamento de Economía y Empresa/Universidad de Almería
La Cañada de San Urbano s/n 04120 Almería/mcvalls@ual.es

SALVADOR CRUZ RAMBAUD

Departamento de Economía y Empresa/Universidad de Almería
La Cañada de San Urbano s/n 04120 Almería/scruz@ual.es

ISABEL MARÍA PARRA OLLER

Departamento de Economía y Empresa/Universidad de Almería
La Cañada de San Urbano s/n 04120 Almería/ipo244@ual.es

e-mail María del Carmen Valls Martínez: mcvalls@ual.es

Resumen

El equilibrio de género en los consejos de administración es un objetivo incluido en la legislación de muchos países, especialmente promovido por la Comisión Europea para lograr la igualdad de género en los procesos de toma de decisiones. Por otra parte, los problemas sociales y medioambientales causados por el progreso económico han incrementado el interés por la sostenibilidad en las últimas décadas. Usando los datos de las principales empresas españolas que cotizan en Bolsa, desde 2003 a 2017, comprobamos si un mayor número de mujeres en los consejos de administración influye en la responsabilidad social empresarial (RSE), a través de la publicación de informes según los criterios de la *Global Reporting Initiative* o la inclusión en el índice *Dow Jones Sustainability*. Mediante el uso de modelos *probit* y la estimación de variables instrumentales para abordar problemas de endogeneidad y causalidad reversa, encontramos que la presencia femenina en los puestos directivos está positivamente unida tanto a la realización de informes voluntarios de RSE como a la inclusión de la empresa en un índice de sostenibilidad, lo cual apoya la idea de promulgar legislación de género.

Palabras clave: Consejo de administración, Responsabilidad social corporativa, Informes de sostenibilidad, Índice de sostenibilidad, Diversidad de género, Políticas de género.

Abstract

Gender balance on board of directors is an objective included in the legislation of many countries, especially promoted by the European Commission to reach gender equality in the processes of decision-making. On the other hand, social and environmental problems

caused by the economic progress have enhanced the interest in sustainability in the last decades. Using the data of top Spanish listed companies, from 2003 to 2017, we test if the higher number of women on the firm board influences the corporate social responsibility (CSR), through the disclosure of reports following the Global Reporting Initiative guidelines or the inclusion in the Dow Jones Sustainability index. By using probit models and instrumental variable estimation to address endogeneity and reverse causality problems, we find that the female presence in management positions is positively linked to both a voluntary CSR reports disclosure and the inclusion in a sustainability index, which supports gender legislation.

Key Words: Board of directors, Corporate social responsibility, Sustainability reports, Sustainability index, Gender diversity, Gender policies.

Eje Temático 3 : Economía del Sector Público. Administración y Gobernanza

LOS DETERMINANTES DEL GASTO TURÍSTICO DE LOS HOGARES MEXICANOS: APLICACIÓN DE UN MODELO DE REGRESIÓN LOGÍSTICO

JOSÉ CARLOS GONZÁLEZ NÚÑEZ

Universidad Anáhuac México Campus Sur
josecarlos.gonzalez@anahuac.mx

LILIANA RUIZ FUENTES

Universidad del Valle de México

e-mail José Carlos González: josecarlos.gonzalez@anahuac.mx

Resumen

El estudio y análisis del gasto turístico resulta fundamental para un adecuado desarrollo de la industria. Existen diversos estudios realizados en México donde se ha llevado a cabo análisis para explicar el flujo de turistas internacionales, utilizando variables como el tipo de cambio, el nivel de precios, entre otros; sin embargo, no se ha analizado suficientemente las variables que determinan el gasto nacional turístico tomando en cuenta factores microeconómico de los hogares.

La presente investigación desarrolla una perspectiva diferente, al aplicar un modelo econométrico logístico para determinar las variables de carácter económico y socio demográfico de los hogares mexicanos que determinan el gasto turístico, como son: los paquetes, hospedajes, tours, entre otros. El modelo utiliza datos microeconómicos que se obtiene de la Encuesta Nacional de Ingresos y Gastos del 2016, (ENIIG), la cual es representativa a nivel nacional y por entidad federativa.

De la diversidad de factores utilizados con base a una discusión teórica, se encuentran que las variables explicativas significativas del modelo son los ingresos, la educación, el sexo del jefe del hogar, el numero de integrantes de la familia y el nivel socioeconómico. Los resultados muestran que las variables de mayor efecto están asociadas con la educación del jefe de la familia y los ingresos. Tomando en cuenta dichos resultados se plantean estrategias para el desarrollo de políticas públicas.

Eje Temático 4 : Economía Sectorial y de Servicios

AN APPROACH TO CUSTOMER TRUST IN THE PORTUGUESE BANKING SYSTEM

ANTÓNIO CABEÇAS

CARS – Centro de Análise Económica de Regulação Social/Universidade Autónoma de Lisboa
Rua de Santa Marta, 47. 1150-293 Lisboa

ANTÓNIO DUARTE SANTOS

CARS – Centro de Análise Económica de Regulação Social/Universidade Autónoma de Lisboa
Rua de Santa Marta, 47. 1150-293 Lisboa

e-mail António Duarte Santos: ajsantos@autonoma.pt

Abstract

Globalization, viewed as a transformation in economics, politics and culture, has led to more intense competition in different sectors of the economy. In the banking sector, the analysis of customer satisfaction, loyalty and trust has been considered of great interest in recent years. We aim to analyse the evolution of bank customer satisfaction and loyalty and, with more detail, customer trust evolution. The methodology used was based on the results of surveys carried out with relevant statistical samples in Portugal. Scientific development, particularly in the field of behavioural economics, as well as in the field of neurology, gave rise to neuroeconomics. This allowed for adaptation and change of traditional economic decision-making theories, based only on economic rationality, in the wake of the Cartesian dualism and Newtonian atomism. Our approach permits a better understanding of the decision making by individuals. Previous studies have evidenced that, currently, in Portugal, the most relevant element for customer satisfaction and loyalty towards its main bank is trust. The growth or downward trend of these two variables will be a good indicator to understand the evolution of customer trust in banking evolution. It has been verified that customer trust in banking and in the evolution of the banks in the past years is not as negative as could be expected, considering all the problems that have affected this sector, in particular in Portugal. However, customer satisfaction has been decreasing over the past two years. A significant change in the banking activity is taking place in terms of approach, which may lead to a decline in customer trust.

Key Words: Banking, bank customer, customer satisfaction, customer loyalty, customer trust, behavioral economics.

Thematic Axe 4 : Sectorial Economy and Services



THE ROLES OF AGENCY COSTS AND LOW COUNTRY LEVEL SHAREHOLDER PROTECTION ON FAMILY FIRMS' CASH HOLDING DECISION

M. BELÉN LOZANO

Departamento de Administración y Economía de la Empresa/Universidad de Salamanca
Campus Miguel de Unamuno 37001 Salamanca/beloga@usal.es

SERHAT YAMAN

Departamento de Administración y Economía de la Empresa/Universidad de Salamanca
Campus Miguel de Unamuno 37001 Salamanca/serhaty@usal.es

e-mail M. Belén Lozano: beloga@usal.es

Resumen

En este trabajo analizamos la relevancia que poseen la protección de los accionistas a nivel institucional y los costes de la agencia asociados a las políticas de cash holding en las empresas familiares. Obtenemos que los costes de agencia de tipo I y II ejercen un impacto más poderoso que la protección institucional en los países de baja protección. Además, nuestros resultados también muestran que las empresas familiares, las empresas familiares con accionistas dominantes, las empresas familiares jóvenes, las empresas en los países de bajo nivel de protección de los accionistas (o ley civil) acumulan más efectivo que las empresas no familiares, las empresas familiares sin accionistas dominantes, las familias antiguas empresas, empresas en países de alto nivel de protección de los accionistas (o common law), respectivamente.

Todos los resultados empíricos están obtenidos usando la metodología de panel de datos que es un avance importante y una contribución para la literatura del cash holding y de la propiedad familiar. Esa metodología nos permite controlar la heterogeneidad inobservable que es un problema que afecta a muchos modelos económicos y financieros. Simultáneamente la metodología de panel data, y más específicamente el uso del generalized method of moments (GMM) nos permite controlar la posible endogeneidad de las variables explicativas.

Palabras clave: Cash holdings, Family firms, Agency costs, Country level shareholder protection.

Abstract

We analyze the relevance of country level shareholder protection and agency costs on family firms' cash holding policies. We find for family firms, that I and II type agency costs exert a stronger impact than low level shareholder protection on deciding cash holding policies. In addition, our results also show that family firms, family firms with dominant shareholder, young family firms, firms in low level shareholder protection (or civil law) countries hold more cash

than non-family firms, family firms without dominant shareholder, old family firms, firms in high level shareholder protection (or common law) countries, respectively.

All empirical results have been obtained using the panel data methodology, which is an important advance and contribution to the cash holding and family ownership literature. This methodology enables us to control for unobservable heterogeneity, which is a problem that affects most economics and finance models. Simultaneously, the panel data methodology, and more specifically the use of the generalized method of moments (GMM) allows us to control for the possible endogeneity of the explanatory variables.

Key Words: Cash holdings, Family firms, Agency costs, Country level shareholder protection.

Eje Temático 7 : Economía y Empresa



CONSISTENCIA y COMPATIBILIDAD EN DECISIÓN EN GRUPO CON EL PROCESO ANALÍTICO JERÁRQUICO (AHP). ALGUNAS IDEAS DE MEJORA

JOSÉ MARÍA MORENO JIMÉNEZ

Grupo Decisión Multicriterio Zaragoza/Instituto de Investigación en Ingeniería de Aragón
Facultad de Economía y Empresa/Universidad de Zaragoza
Gran Vía, 2. 50005 Zaragoza/moreno@unizar.es

JUAN AGUARÓN JOVEN

Grupo Decisión Multicriterio Zaragoza/Instituto de Investigación en Ingeniería de Aragón
Facultad de Economía y Empresa/Universidad de Zaragoza

MARÍA TERESA ESCOBAR URMENETA

Grupo Decisión Multicriterio Zaragoza/Instituto de Investigación en Ingeniería de Aragón
Facultad de Economía y Empresa/Universidad de Zaragoza

ALBERTO TURÓN LANUZA

Grupo Decisión Multicriterio Zaragoza/Instituto de Investigación en Ingeniería de Aragón
Facultad de Economía y Empresa/Universidad de Zaragoza

e-mail José María Moreno Jiménez: moreno@unizar.es

Resumen

A comienzos del siglo XXI, los autores de este trabajo abrieron una línea investigadora para la toma de decisiones en grupo con el Proceso Analítico Jerárquico (AHP-GDM) basada en la consistencia (transitividad cardinal de los juicios); una de las propiedades más destacadas de AHP. A partir de las matrices de juicios individuales, los autores calcularon las matrices de consistencia individuales. Cada entrada de estas matrices de intervalos de juicio, refleja el rango de valores en el que podía oscilar el juicio sin que la consistencia de la matriz superara el umbral marcado. La intersección de estas matrices de consistencia individuales determina la matriz de Consenso en Consistencia (CCM) para el grupo. Una posición de esta matriz refleja el rango de valores en el que todos los decisores son consistentes en sus matrices iniciales. En 2014 los autores mejoraron (mayor número de entradas no nulas) la CCM con la matriz de Consenso en Consistencia Precisa (PCCM). En 2019 se ha mejorado la compatibilidad individual con respecto a la posición colectiva de la PCCM mediante un procedimiento iterativo. En lo que sigue, se presentan algunas ideas sobre cómo mejorar conjuntamente la consistencia y la compatibilidad de cualquier matriz de consenso colectiva para el caso de AHP-GDM en un contexto local (un único criterio).

Palabras clave: Proceso Analítico Jerárquico(AHP), Decisión en Grupo, Consistencia, Compatibilidad, Consenso.

Abstract

Some twenty years ago, the authors of this work began a line of research on group decision making with the Hierarchical Analytical Process (AHP-GDM) based on consistency (the cardinal transitivity of judgments), which is one of the most outstanding properties of the AHP. From the matrices of individual judgments, the authors calculated the individual consistency matrices. Each entry of the interval judgments matrices reflects the range of values in which the judgment could oscillate without the consistency of the matrix exceeding a set threshold. The intersection of the individual consistency matrices determines the *Consistency Consensus matrix* (CCM) for the group. The position of this matrix reflects the range of values in which all decision makers are consistent in their initial matrices. In 2014, the authors improved (greater number of non-null entries) the CCM with the *Precise Consistency Consensus Matrix* (PCCM). In 2019, individual compatibility with respect to the collective position of the PCCM has been improved through an iterative procedure. In what follows, we present some ideas on how to improve both the consistency and compatibility of any collective consensus matrix for the case of AHP-GDM in a local context (a single criterion).

Key Words: Analytic Hierarchy Process (AHP), Group Decision Making, Consistency, Compatibility, Consensus.

Eje Temático 9 : Economía Cuantitativa. Para la Economía y la Empresa



UN SISTEMA DE INVENTARIO CON DEMANDA DEPENDIENTE DEL TIEMPO, PÉRDIDA DE VENTAS Y PERÍODO DISCRETO DE PLANIFICACIÓN

JOAQUÍN SICILIA RODRÍGUEZ

Facultad de Ciencias/Departamento de Matemáticas, Estadística e Investigación Operativa
Universidad de La Laguna/Astrofísico Francisco Sánchez, s/n. 38206. La Laguna, Tenerife. Islas
Canarias. España/jsicilia@ull.es

LUIS AUGUSTO SAN JOSÉ NIETO

IMUVA/Escuela de Ingeniería Informática de Valladolid/Departamento de Matemática Aplicada
Universidad de Valladolid/Campus Miguel Delibes, Paseo de Belén nº 15, 47011.
Valladolid. España/augusto@mat.uva.es

MANUEL GONZÁLEZ DE LA ROSA

Facultad de Economía, Empresa y Turismo/Departamento de Dirección de Empresas e Historia
Económica/Universidad de La Laguna/Campus de Guajara, s/n, 38071. La Laguna, Tenerife. Islas
Canarias. España/mgonzale@ull.edu.es

JAIME FEBLES ACOSTA

Facultad de Economía, Empresa y Turismo/Departamento de Dirección de Empresas e Historia
Económica/Universidad de La Laguna/Campus de Guajara, s/n, 38071. La Laguna, Tenerife. Islas
Canarias. España/jfebles@ull.es

e-mail Joaquín Sicilia Rodríguez: jsicilia@ull.es

Resumen

Este trabajo estudia un sistema de inventario en el que se supone que el periodo de planificación debe ser un múltiplo de un periodo básico prefijado. La demanda del producto depende del tiempo y, en cada periodo básico, sigue un patrón potencial. En el modelo se permiten las roturas o falta de existencias y las mismas no se pueden recuperar, convirtiéndose así en ventas perdidas. Los costes relacionados con la gestión del inventario que se consideran son: el coste de compra, el coste de pedido, el coste de mantenimiento y el coste de rotura. Se define la función beneficio a lo largo del ciclo del inventario como la diferencia entre los ingresos obtenidos por la venta del producto y la suma de los costes relacionados con el control y administración del inventario. El problema consiste en determinar la mejor política de inventario que maximice el beneficio por unidad de tiempo. La formulación del modelo lleva a tener que resolver un problema de programación matemática entera no lineal. Para encontrar la solución óptima del problema de inventario se estudian primero las propiedades de la función a optimizar y luego se desarrolla un procedimiento algorítmico que permite determinar el tamaño óptimo del lote y el periodo óptimo de planificación. Finalmente, se presentan algunos ejemplos numéricos que pueden

ayudar a entender el método propuesto para la obtención de la solución óptima del problema de inventario.

Palabras clave: Gestión de inventarios, Cantidad económica de pedido, Demanda dependiente del tiempo, Pérdida de ventas, Periodo discreto de planificación.

Eje Temático 4 : Economía Sectorial y de Servicios

Eje Temático 9 : Economía Cuantitativa. Para la Economía y la Empresa

Abstract

This paper studies an inventory system in which it is assumed that the planning period must be a multiple of a predetermined basic period. Demand for the product depends on time and, in each basic period, follows a power pattern. In the model shortages or lack of stock are allowed and they cannot be recovered, thus becoming lost sales. The costs related to the management of the inventory that are considered are: the purchasing cost, the ordering cost, the holding cost and the shortage cost. The profit function throughout the inventory cycle is defined as the difference between the income obtained from the sales of the product and the sum of the costs related to the control and administration of the inventory. The problem is to determine the best inventory policy that maximizes the profit per unit of time. The formulation of the model leads to having to solve an integer nonlinear mathematical programming problem. To find the optimal solution to the inventory problem, the properties of the function to be optimized are first studied and then an algorithmic procedure is developed to determine the optimum lot size and the optimal scheduling period. Finally, some numerical examples that can help to understand the proposed method for obtaining the optimal solution of the inventory problem are presented.

Key Words: Inventory Management, Economic Ordering Quantity, Time-dependent Demand, Lost Sales, Discrete Scheduling Period.

Thematic Area: Quantitative Economy. Quantitative Methods for Business and Economics; Sectorial Economy and Services.

IS THE CONTRIBUTION OF THE DIMENSION OF THE FINANCIAL SECTOR TO ECONOMIC GROWTH IN EUROPEAN UNION ALWAYS POSITIVE? A PANEL DATA ANALYSIS OF THE EU-28 COUNTRIES

MARIA CLARA DIAS PINTO RIBEIRO

CEOS.PP/Área Científica de Economia/ISCAP/IPP Instituto Superior de Contabilidade e Administração,
Rua Jaime Lopes Amorim 4465-004 S. Mamede de Infesta - Portugal/mclara@iscap.ipp.pt

FRANCISCO VITORINO DA SILVA MARTINS

Grupo de Ciências Empresariais/Faculdade de Economia (FEP)/Universidade do Porto/
Faculdade de Economia da Universidade do Porto/Rua Dr. Roberto Frias, 4200-464 Porto - Portugal

e-mail Maria Clara Dias Pinto Ribeiro: mclara@iscap.ipp.pt

Resumo

A ligação entre o sector financeiro e a economia real foi evidenciada pelas recentes crises de *subprime* e soberanas que atingiram fortemente o mundo e especificamente a Europa. Esta investigação pretende clarificar a importância e o impacto do sector financeiro no crescimento da economia real da União Europeia.

Um dos objectivos é avaliar a existência de um limiar a partir do qual o sector financeiro que cresceu impulsionado pela liberalização. Desregulamentação e globalização, não contribui positivamente para a evolução da economia real. Na investigação consideramos dois aspectos do desenvolvimento financeiro: um relativo ao enquadramento institucional e outro aos mercados financeiros. Pretende-se recorrer às variáveis recentemente criadas pelo IMF staff que permitem o uso de dados que ilustram melhor o grau de desenvolvimento financeiro, sendo as variáveis mais holísticas e mais adequadas e específicas do que as que têm sido usadas, ao mesmo tempo que segmentam as determinantes macrofinanceiras das micro.

Neste estudo é assumida a possibilidade de existência de corrupção nas decisões e ações financeiras, pelo que se analisa se os índices de corrupção por país em interação com o grau de desenvolvimento financeiro condicionam o crescimento económico.

A investigação contempla também a avaliação do impacto da crise no crescimento real da economia.

No estudo usam-se dados em painel dos países da União Europeia de 1995 a 2017 e nos modelos econométricos introduzem-se parâmetros para captar a heterogeneidade das unidades seccionais (países) bem como de natureza temporal para dar conta da flutuação da conjuntura económica.

Conclui-se propondo algumas medidas de política económica que refletem o grau de desenvolvimento financeiro, a sua natureza institucional e de mercado e os vestígios de corrupção.

Palavras chave: Crescimento económico, Desenvolvimento financeiro, Índice de corrupção, Dados em painel, União Europeia

Eje Temático 1 : Economia Internacional

Abstract

The link between the financial sector and the real economy has been evidenced by the recent subprime and sovereign crises that hit the world and, more specifically, Europe. This research aims to clarify the importance and impact of the financial sector in the growth of the real economy of the European Union.

One of the objectives is to assess the existence of a threshold from which the financial sector grew driven by liberalization. Deregulation and globalization do not contribute positively to the evolution of the real economy. In this research we consider two aspects of financial development: one concerning the institutional framework and the other, financial markets. We intend to use the variables recently created by the IMF staff that allow the use of data that better illustrate the degree of financial development, the variables being more holistic and more adequate and specific than those that have been used, while also segmenting macro and financial determinants from micro.

In this study, the possibility of corruption in financial decisions and actions is assumed, so we analyze whether corruption indexes per country in interaction with the degree of financial development condition economic growth.

The research also includes assessing the impact of the crisis on real economic growth.

The study uses panel data from the European Union countries from 1995 to 2017 and, in the econometric models, parameters are introduced to capture the heterogeneity of the sectional units (countries), as well as of a temporal nature to account for the fluctuation of the economic conjuncture.

We conclude by suggesting some economic policy measures that reflect the degree of financial development, its institutional and market nature and the traces of corruption.

Key words: Economic Growth, Financial Development, Corruption Index, Panel Data, European Union

Thematic Area 1 : International economy

EL SISTEMA DE FINANCIACIÓN DE LAS ENTIDADES DEL TERCER SECTOR MEDIANTE LA 'X SOLIDARIA'

FRANCESC HIGÓN TAMARIT

Departamento de Economía Aplicada de la Universidad deValencia
Facultad de Economía. Campus dels Tarongers, s/n 46022 Valencia/higonf@uv.es

TERESA SAVALL MORERA

Departamento de Economía Aplicada de la Universidad deValencia
Facultad de Economía. Campus dels Tarongers, s/n 46022 Valencia/teresa.savall@uv.es

e-mail Francesc Higón Tamarit: higonf@uv.es

Resumen

En la última década España se ha visto profundamente afectada por las consecuencias de la crisis económica, crisis que ha provocado que los niveles de desempleo superen el 26% y que el nivel de endeudamiento y la tasa de pobreza aumenten de manera significativa, alcanzando la tasa de riesgo de exclusión el 22%. Esto ha derivado en una profunda recesión social que requiere respuestas innovadoras para que, en un contexto de austeridad presupuestaria pública, se reviertan las duras condiciones sociales que se han ido forjando durante el periodo de crisis.

Las entidades del Tercer Sector han demostrado durante este periodo, y en anteriores crisis, ser un elemento clave de innovación social, consiguiendo resistir y atenuar los problemas generados por la crisis, dando respuestas a los problemas de desempleo e incremento de la pobreza (Hansmann (1980), Weisbrod (1975), Salamon y Anheier (1997)).

La financiación que estas entidades reciben a través del programa de subvenciones para la realización de programas de interés general con cargo a la asignación tributaria del Impuesto sobre la Renta de las Personas Físicas (IRPF), es importante llegando a casi 300 millones de euros.

Nuestro objetivo es analizar las particularidades y evolución de este sistema de subvenciones en los últimos años en España. En concreto se centra en explicar el cambio de gestión que se ha producido recientemente, pasando de estar totalmente centralizado a estar parcialmente descentralizado, las características de las ayudas que se conceden, su evolución en términos de recursos destinados y la repercusión y distribución que se ha dado entre las entidades del sector.

Los resultados contribuyen a esclarecer el funcionamiento y el impacto de un sistema de financiación muy importante para las entidades del tercer sector, y en consecuencia para el desarrollo de un sistema innovador de ayudas sociales implementado por el propio sector.

Palabras clave: Tercer Sector, X solidaria, economía pública, financiación, subvenciones.

Abstract

In the last decade Spain has been deeply affected by the consequences of the economic crisis. This crisis has caused unemployment levels to exceed 26% and the level of indebtedness and the poverty rate to increase significantly, reaching the social exclusion rate 22%. This has led to a deep social recession that requires innovative responses so that, in a context of public budgetary austerity, the harsh social conditions that have been forged during the crisis period are reversed.

The entities of the Third Sector have demonstrated during this period, and in previous crises, to be a key element of social innovation, managing to resist and mitigate the problems generated by the crisis, giving answers to the problems of unemployment and increasing poverty (Hansmann (1980), Weisbrod (1975), Salamon and Anheier (1997)).

The financing that these entities receive through the program of subsidies for the realization of programs of general interest charged to the tax assignment of the Personal Income Tax (IRPF) is important, reaching almost 300 million euros.

Our objective is to analyze the particularities and evolution of this subsidy system in recent years in Spain. Specifically, we focus on explaining the change in management that has taken place recently, going from being totally centralized to being partially decentralized, the characteristics of the aid granted, its evolution in terms of resources allocated and the repercussion and distribution that has been made between the entities of the sector.

The results should help to clarify the functioning and impact of a very important financing system for the entities of the Third Sector, and consequently for the development of an innovative system of social aid implemented by the sector itself.

Key Words: Third Sector, "solidarity X", public economy, financing, subsidies.

Eje Temático 6 : Economía Social, Cooperación y Desarrollo

LA MEDICIÓN DE LA EFICIENCIA MEDIOAMBIENTAL EN PRESENCIA DE OUTPUTS NO DESEABLES: UNA APLICACIÓN PARA DESTINOS TURÍSTICOS EN ESPAÑA

EMMA ZAPICO FERNÁNDEZ

Facultad de Economía y Empresa/Departamento de Economía/Universidad de Oviedo
Campus del Cristo, 33006, Oviedo, España/zapicoemma@uniovi.es

JOSÉ F. BAÑOS PINO

Facultad de Economía y Empresa/Departamento de Economía/Universidad de Oviedo
Campus del Cristo, 33006, Oviedo, España/jbanos@uniovi.es

MATÍAS MAYOR FERNÁNDEZ

Facultad de Economía y Empresa/Departamento de Economía Aplicada/Universidad de Oviedo
Campus del Cristo, 33006, Oviedo, España/mmayor@uniovi.es

e-mail Emma Zapico: zapicoemma@uniovi.es

Resumen

Desde mediados del siglo pasado el sector turístico ha experimentado un crecimiento espectacular, hasta el punto de configurarse como una actividad clave para el crecimiento económico y la generación de empleo en los destinos receptores. Sin embargo, la masificación sufrida desde los años ochenta en muchos territorios, puso de manifiesto las importantes externalidades negativas que la presión turística ejerce sobre el medioambiente y las comunidades receptoras (generación de residuos sólidos, ruido, saturación, contaminación del aire, degradación de ecosistemas marinos, etc.).

El objetivo concreto de este trabajo será determinar qué territorios son capaces de atraer un mayor número de turistas y a la vez ser más eficientes medioambientalmente en la gestión de los residuos sólidos generados por los mismos. Para ello se tratará al turismo como una industria en la que dada una serie de inputs (empleados, camas y establecimientos) se generan outputs deseables (viajeros y pernoctaciones) y no deseables (residuos sólidos).

En el estudio empírico se empleará una base de datos con estructura de panel para 42 zonas turísticas de España durante el periodo 2000-2016. La metodología empleada se basa en la aplicación de un análisis paramétrico de fronteras estocásticas con funciones distancia, muy útiles para describir tecnologías productivas en presencia de outputs no deseables, para los que no existen precios de mercado. Concretamente, siguiendo a Cuesta et al. (2009) se emplea como forma funcional la función de distancia hiperbólica translogarítmica.

Los resultados obtenidos hasta el momento muestran uno nivel de eficiencia media próximo al 90%, oscilando entre el 80% de las zonas menos eficientes y el 99% de las más eficientes.

Palabras clave: turismo, externalidades negativas, eficiencia medioambiental, fronteras estocásticas, funciones distancia.

¿AFECTA LA CALIDAD INSTITUCIONAL DEL GOBIERNO AL NIVEL DE DELITO DE LOS PAÍSES?

MANUEL BLASCO

I.E.F.F.C.E-Universidad Nacional de Córdoba
Bv. Enrique Barros s/n – Ciudad Universitaria Córdoba - Argentina

HÉCTOR GERTEL

.E.F.F.C.E-Universidad Nacional de Córdoba
Bv. Enrique Barros s/n – Ciudad Universitaria Córdoba - Argentina

e-mail Manuel Blasco: blascomanuel91@gmail.com

Resumen

Uno de los Objetivos de Desarrollo del Milenio apunta a reducir la tasa de homicidios en los países menos desarrollados. Las Naciones Unidas reportan para los mismos, tasas de homicidio que duplican las de los países desarrollados. Las mayores tasas de homicidios de estos países, podrían resultar, en parte de las debilidades agudas que acusan en relación al pleno funcionamiento del estado de derecho. Estudios recientes sugieren una asociación entre el nivel de eficacia de los institutos públicos que hacen a la gobernabilidad, la percepción de la población sobre la impunidad, y los costos que envuelve la comisión de homicidios. Esto contribuye a explicar el nivel observado de la tasa media nacional de homicidios. Utilizando datos transversales del año 2015 compilados por la OMS, la UNODC y el Banco Mundial para 115 países, y la taxonomía de institutos que hacen a la gobernabilidad desarrollada en Kauffman et.al. (2011) esta investigación examinó empíricamente la asociación entre calidad de estos institutos y nivel observado de la tasa media nacional de homicidios. Se aplicó un modelo lineal múltiple corregido por el método de errores robustos de White. Se encontró una relación inversa y estadísticamente significativa entre la tasa media nacional de homicidios e indicadores de “imperio de la ley”, “efectividad de gobierno” y “control de la corrupción”. No resultó estadísticamente significativa la relación entre la tasa media nacional de homicidios y los parámetros de “estabilidad política”, de “regulación de la economía” y de “voz y responsabilidad social”. La reacción de la tasa de homicidios ante cambios en “imperio de la ley”, “efectividad de gobierno” y “control de la corrupción” superó en América Latina el valor obtenido para el resto del mundo. Para África, este efecto resultó estadísticamente no significativo. Estos resultados son de interés al diseño de políticas focalizadas para abatir las tasas de homicidio en países de menor desarrollo relativo.

Palabras clave: Delito, Economía, Instituciones, Gobierno.

Abstract

One of the Millennium Development Goals aims to reduce the homicide rate in the least developed countries. The United Nations reports homicide rates that double those of developed countries. The highest homicide rates in these countries could be result, in part, from the acute weaknesses they accuse in relation to the full functioning rule of law. Recent studies suggest an association between the level of effectiveness of public institutes that make governance, the perception of the population about impunity, and the costs involved in the commission of homicides. This helps explain the observed level of the average national homicide rate. Using cross-sectional data for 2015 compiled by WHO, UNODC and the World Bank for 115 countries, and the taxonomy of institutes that make governance developed in Kauffman et.al. (2011) this research empirically examined the association between the quality of these institutes and the observed level of the average national homicide rate. A multiple linear model corrected by White's robust error method was applied. An inverse and statistically significant relationship was found between the average national rate of homicides and indicators of "rule of law", "government effectiveness" and "control of corruption". The relationship between the average national homicide rate and the parameters of "political stability", "regulatory quality" and "voice and accountability" was not statistically significant. The reaction of the homicide rate to changes in "rule of law", "government effectiveness t" and "control of corruption" exceeded in Latin America the value obtained for the rest of the world. For Africa, this effect was statistically not significant. These results are of interest in the design of targeted policies to reduce homicide rates in relatively less developed countries.

Key Words: Crime, Economics, Institutions, Government.

Eje Temático 3 : Economía del Sector Público. Administración y Gobernanza

AHORRO PREVISIONAL EN EL MERCADO ESPAÑOL: UN ESTUDIO LONGITUDINAL

LUCÍA REY ARES

Facultad de Humanidades y Documentación/Departamento de Empresa/Universidade da Coruña
Campus de Esteiro, s/n. CP 15403. Ferrol (España)

MILAGROS VIVEL BÚA

Facultad de Ciencias Económicas y Empresariales/Departamento de Economía Financiera y
Contabilidad/Universidade de Santiago de Compostela
Avda. Burgo das Nacións, s/n. CP 15782. Santiago de Compostela (España)

RUBÉN LADO SESTAYO

Facultad de Economía y Empresa/Departamento de Empresa/Universidade da Coruña
Campus de Elviña. CP 15071. A Coruña (España)

SARA FERNÁNDEZ LÓPEZ

Facultad de Ciencias Económicas y Empresariales/Departamento de Economía Financiera y
Contabilidad/Universidade de Santiago de Compostela
Avda. Burgo das Nacións, s/n. CP 15782. Santiago de Compostela (España)

e-mail Lucía Rey Ares: lucia.rey.ares@usc.es

Resumen

Investigaciones previas avalan de forma suficiente el efecto positivo y estadísticamente significativo de los recursos económicos de la unidad familiar y/o el individuo sobre su ahorro previsional, tanto en términos de existencia como de volumen. Diferentes argumentos explican el signo de esta relación, como el hecho de que, a mayor nivel de ingresos, mayores son los recursos económicos disponibles para ahorrar e invertir, y mayores suelen ser también los beneficios fiscales que se derivan de la inversión en determinados productos financieros. Asimismo, a menor nivel de ingresos, menor necesidad de ahorro privado para la jubilación se percibe, al confiar en que el sistema público de pensiones será capaz de compensar las diferencias salariales de etapas anteriores. A mayores, ocurre que el efecto que otras variables -como el sexo, la formación educativa o la tenencia de descendientes a cargo- tienen sobre el ahorro previsional podría variar en función del nivel de recursos monetarios del potencial inversor.

En este contexto, esta investigación tiene por objeto analizar el ahorro previsional en el mercado español para así contrastar la existencia y, en su caso, magnitud, de los efectos antes descritos. El trabajo se organiza en una primera parte focalizada en la revisión de la literatura, y una segunda que presenta el análisis empírico, el cual utiliza una muestra de datos longitudinal de la población española en el período 2008-2015 para la estimación de modelos binarios. Los resultados obtenidos confirman que el volumen de recursos económicos del individuo es una variable significativa en la generación de ahorro previsional a través de esquemas privados de pensiones, influyendo en el efecto de otra variable relevante como es el sexo.

Palabras clave: recursos, ahorro, previsión, pensión, España.

Abstract

Previous research broadly endorses the positive and statistically significant effect of the economic resources of the family unit and/or the individual on their pension savings, both in terms of existence and contributions. Different arguments underline the sign of this relationship, such as the fact that, the higher the level of income, the greater the economic resources available to save and invest, and usually, the greater the tax benefits that accrue from the investment in certain financial assets. In a similar vein, the lower level of income, the lower the perceived need for private savings for retirement, as individuals are confident that the public pension system will compensate the salary differences of previous stages. Besides, it happens that the effect that other variables -such as gender, educational level or having children- exert on pension savings could vary depending on the level of monetary resources of the potential investor.

In this context, this research aims to analyse pension savings in the Spanish case in order to verify the existence and, where appropriate, magnitude, of the effects described above. The communication consists of a first part focused on the review of the literature, and a second part that presents the empirical analysis, which uses a longitudinal data sample of the Spanish population in the period 2008-2015 for the estimation of binary models. Evidence confirms that the volume of economic resources of the individual is a significant variable in the generation of pension savings through private pension schemes, influencing the effect of another relevant variable such as gender.

Key Words: resources, savings, security, pension, Spain.

Eje Temático 7 : Economía y Empresa

COMO CRESCEM AS EMPRESAS? MODOS, CAMINHOS E ESTRATÉGIAS

ROLANDO VAZ

Universidade de Vigo, Faculdade de Ciências Económicas e Empresariais, Espanha

EDUARDO L. GIMENEZ

Departamento de Fundamentos da Análise Económica e Historia e Institucións Económicas
Universidade de Vigo, Espanha

JOSÉ ANTONIO NOVO-PETEIRO

Departamento de Economía/Universidade da Coruña/Espanha

e-mail Rolando Vaz: rolando.vaz@sapo.pt

Resumo

O empresário motivado para o crescimento tem ao seu dispor uma série de estratégias e caminhos estratégicos que pode adotar para fazer crescer, de modos diferentes, as suas unidades de negócio. A presente revisão oferece três contribuições para a literatura do crescimento das empresas. Em primeiro lugar, versa a literatura dos diferentes modos de crescimento (interno, externo e híbrido) e relaciona-a com os caminhos estratégicos que potenciam esses diferentes modos de crescimento e com as estratégias determinantes para o crescimento das empresas. Em segundo lugar, permite apresentar diferentes decisões estratégicas que as empresas podem enfrentar nos três diferentes modos de crescimento. Finalmente, permite referir que o estudo sobre o crescimento das empresas, quer a nível teórico e empírico, está longe de atingir a maturidade. Abrem-se, assim, novos caminhos para futuras investigações.

Palavras-chave: Crescimento da Empresa, Modos de Crescimento, Caminhos para o Crescimento, Estratégias de Crescimento.

Abstract

An entrepreneur motivated for growth has several strategic paths available for expanding the firm's business in different ways. This survey provides three contributions to the literature of firm growth. Firstly, it presents the literature of the different growth modes (internal, external and hybrid) and relates it both with to the strategic paths that foster these different growth modes and with the key strategies for firm growth. Secondly, it presents different strategic decisions that firms may face for each of the three different growth modes. Finally, it finds that the research on firm growth is far from reaching maturity, both theoretically and empirically. This opens up new paths for future research.

Key Words: Growth of the Firm, Modes of Growth, Paths to Growth, Growth Strategies.

Eje Temático 7 : Economía y Empresa

VALORACIÓN Y SELECCIÓN DE ACTIVOS EN EL MERCADO DE LA ENERGÍA: UNA APROXIMACIÓN DINÁMICA MULTIVARIANTE

PILAR GARGALLO VALERO

Facultad de Economía y Empresa/Universidad de Zaragoza
Gran Vía, 2 50005 Zaragoza/pigarga@unizar.es

JESÚS MIGUEL ÁLVAREZ

Facultad de Economía y Empresa/Universidad de Zaragoza
Gran Vía, 2 50005 Zaragoza/jamiguel@unizar.es

MANUEL SALVADOR FIGUERAS

Facultad de Economía y Empresa/Universidad de Zaragoza
Gran Vía, 2 50005 Zaragoza/salvador@unizar.es

e-mail Pilar Gargallo Valero pigarga@unizar.es

Resumen

En este trabajo se analiza el mercado de la energía desde una perspectiva de selección y valoración de activos. Se emplea una metodología dinámica multivariante basada en modelos GARCH que selecciona aquellos modelos que proporcionan la mejor estimación de la evolución de la matriz de varianzas y covarianzas de las rentabilidades diarias de los activos. Esta información puede ser muy útil para que los inversores en el mercado energético construyan sus carteras alcanzando menores niveles de volatilidad, mayores rentabilidades o ambas. El estudio presta una especial atención al papel jugado por los precios de los permisos de emisión de CO₂, con el fin de valorar si han conseguido su objetivo de desincentivar la inversión en combustibles fósiles y estimular la inversión en energías renovables.

Palabras clave: GARCH multivariante, Correlación dinámica condicional, Selección de carteras, EU ETS, Sector energético.

Abstract

In this paper, the energy market is analyzed from a perspective of asset allocation and valuation. We use a multivariate dynamic methodology based on GARCH models that selects those models that provide the best estimate of the evolution of the variances and covariance matrix of the daily returns of the assets. This information can be very useful for investors in the energy market to select their portfolios reaching lower levels of volatility, higher profitability or both. The study pay special attention to the role played by the prices of CO₂ emission allowances, in order to assess whether they have achieved their goal of discouraging investment in fossil fuels and stimulate investment in clean energy.

Key Words: Multivariate GARCH, Dynamic Conditional Correlation, Portfolio Selection, EU ETS, Energy Sector.

Eje Temático 9 : Economía Cuantitativa. Para la Economía y la Empresa

ANÁLISIS DE LAS INTERRELACIONES ENTRE LA EVOLUCIÓN DE LA FLOTA ATUNERA ESPAÑOLA Y EL SECTOR CONSERVERO

JUAN JOSÉ GARCÍA DEL HOYO

Universidad de Huelva
hoyo@dehie.uhu.es

RAMÓN JIMÉNEZ TORIBIO

Universidad de Huelva

FÉLIX GARCÍA ORDAZ

Universidad de Huelva

e-mail Juan José García del Hoyo: hoyo@dehie.uhu.es

Resumen

El objetivo de este trabajo es analizar la evolución del sector de conservero español, en general, y en particular, el de las conservas de atunes así como su interacción con la flota atunera congeladora. En este sentido, se detalla la evolución desde 1900 hasta la actualidad, los cambios experimentados y el desarrollo del subsector de conservas de tñidos. Esta industria ha demostrado ser lo suficientemente competitiva como para sobrevivir al proceso de globalización en comparación con todos los demás países europeos. Se muestran sus principales características, sus fortalezas y sus debilidades.

Se estudia la evolución y la situación actual de la producción, importaciones y exportaciones de atún en conserva, la evolución de la flota atunera y de las firmas armadoras, y de las sociedades participadas en terceros países.

En resumen, este estudio proporciona una descripción actual del sector de procesamiento de pescado y su evolución a lo largo de la historia. Se extraen conclusiones interesantes sobre la situación del sector, utilizando técnicas de análisis de causalidad con series temporales.

Eje Temático 10 : Economía Azul. Del Mar y Actividades Marítimas

IDENTIFICACIÓN BAYESIANA DE SUBGRUPOS HOMOGÉNEOS DE DECISORES EN AHP: BÚSQUEDA ESTOCÁSTICA EN UN CONTEXTO LOCAL

ALFREDO ALTUZARRA CASAS

Facultad de Economía y Empresa/Universidad de Zaragoza
Gran Vía, 2, 50005 Zaragoza/altuzarr@unizar.es

PILAR GARGALLO VALERO

Facultad de Economía y Empresa/Universidad de Zaragoza
Gran Vía, 2, 50005 Zaragoza/pigarga@unizar.es

JOSÉ MARÍA MORENO JIMÉNEZ

Facultad de Economía y Empresa/Universidad de Zaragoza
Gran Vía, 2, 50005 Zaragoza/moreno@unizar.es

MANUEL SALVADOR FIGUERAS

Facultad de Economía y Empresa/Universidad de Zaragoza
Gran Vía, 2, 50005 Zaragoza/salvador@unizar.es

e-mail Alfredo Altuzarra Casas: altuzarr@unizar.es

Resumen

Los problemas de decisión con múltiples actores, en especial los relativos a procesos de participación ciudadana, suelen contemplar un número tan elevado de decisores que hace inviable la utilización de algoritmos de búsqueda exhaustiva para la determinación de subgrupos homogéneos de actores; en función de sus preferencias. Para solventar esa limitación, y en el caso de utilizar AHP estocástico en un contexto local (un único criterio), en lo que sigue se propone un nuevo procedimiento bayesiano de búsqueda estocástica que permite identificar subgrupos homogéneos de actores en función de un umbral máximo de inconsistencia común para todos los decisores considerados. El algoritmo propuesto reduce significativamente el tiempo computacional de identificación de los subgrupos con respecto a un método de búsqueda exhaustiva. Estos métodos de búsqueda exhaustiva suelen resultar difíciles de aplicar en situaciones con más de una docena de actores por la gran cantidad de posibles agrupaciones existentes. La metodología propuesta se ilustra mediante un caso real de participación ciudadana basado en la E-Cognocracia.

Palabras clave: AHP estocástico, Inferencia Bayesiana, Búsqueda estocástica, Identificación de grupos, Número de actores.

Abstract

Decision problems with multiple actors, especially those related to processes of citizen participation, tend to involve such a large number of decision makers that makes unviable the use of exhaustive search algorithms for the determination of homogeneous subgroups of actors based on their preferences. To solve this limitation, and in the case of using stochastic AHP in a local context (a single criterion), this paper proposes a new stochastic search method which allows the identification of homogeneous subgroups of actors based on a maximum common inconsistency threshold. The proposed algorithm significantly reduces the computational time of subgroup identification with respect to an exhaustive search method. These exhaustive search methods are often difficult to apply in situations with more than a dozen actors because of the large number of possible existing groups. The methodology is illustrated by a real case of citizen participation based on E-Cognocracy.

Key Words: Stochastic AHP, Bayesian Inference, Stochastic Searching Stochastic, Identification of groups, Number of actors.

Eje Temático 9 : Economía Cuantitativa. Para la Economía y la Empresa

A RELAÇÃO ENTRE A DIMENSÃO DO SISTEMA FINANCEIRO E O CRESCIMENTO ECONÓMICO: EVIDÊNCIA PARA OS PAÍSES DA REGIÃO DA ÁFRICA SUBSARIANA

CELSA MACHADO

ISCAP-P.PORTO/CEF.UP/CEOS.PP
celsa@iscap.ipp.pt

PAULO VIEIRA

ISCAP-P.PORTO/CEOS.PP
pddv@iscap.ipp.pt

ANTÓNIO SARAIVA

ISCAP-P.PORTO/CEOS.PP
asaraiva@eu.ipp.pt

e-mail Celsa Machado: celsa@iscap.ipp.pt

Resumo

É já considerável a literatura sobre a análise do impacto do desenvolvimento financeiro no crescimento económico. Em geral, a literatura tem evidenciado um impacto positivo do bom funcionamento do setor financeiro sobre o crescimento económico, permitindo conjecturar que o desenvolvimento deste setor seja indutor de mais crescimento económico. No entanto, considerando a recente crise global de 2007-2008, é razoável admitir que o sobredimensionamento do setor financeiro possa ser prejudicial para o crescimento económico. Consequentemente, a literatura empírica recente sobre a relação existente entre o desenvolvimento do setor financeiro e o crescimento económico tem investigado a hipótese do perfil dessa relação ser não linear.

Este estudo contribui para esta literatura, examinando o perfil da relação existente entre a dimensão do setor financeiro e o crescimento económico em países que se contam entre os mais pobres, como é o caso dos países da África Subsariana. Com base numa amostra de 46 países da África Subsariana, para o período 1980-2017, estimou-se um modelo com dados em painel, considerando a hipótese da relação entre o nível de desenvolvimento financeiro e o crescimento económico ser não linear.

Os resultados empíricos sugerem que, mesmo para os países da África Subsariana, existe uma relação em U-invertido entre a dimensão do setor financeiro e o crescimento económico. Os resultados das estimações mostram que o nível de desenvolvimento financeiro, medido quer pelo peso do crédito doméstico concedido ao setor privado no PIB quer pelo peso da moeda em sentido lato no PIB, influencia positivamente o crescimento económico até um certo limiar mas negativamente, ultrapassado esse limiar.

É relevante, para a condução da política económica, saber até onde o crescimento do setor financeiro potencia o crescimento económico e a partir de que nível se torna adverso para o

crescimento económico.

Palavras-chave: Desenvolvimento financeiro, crescimento económico, África Subsariana, não-linearidade.

Abstract

A large amount of literature has examined the effect of financial development on economic growth. In general, the literature highlights the positive impact on economic growth of a well-functioning financial system, allowing to expect that more finance leads to more growth. However, in light of the recent 2007-2008 global crisis, it is reasonable to admit that too much finance can be harmful to economic growth. Therefore, recent empirical literature on the link between financial development and economic growth investigates whether this relationship is non-linear.

This study contributes to this literature, examining the shape of the relationship between financial development and economic growth in countries that are among the poorest countries, the Sub-Saharan African countries. Using a sample of 46 countries from Sub-Saharan Africa, for the period 1980-2017, we estimate a panel data model, allowing for a non-linear relationship between the level of financial development and economic growth. The empirical results suggest that, even for Sub-Saharan African countries, there is an inverted U-shaped relationship between the size of the financial sector and economic growth. Estimation results show that the level of financial development, measured either by the domestic credit to private sector relative to GDP or by broad money relative to GDP, is good for economic growth only up to a threshold point, after which it becomes harmful.

Being aware of the point until where finance spurs growth and where further enlargement becomes a drag on growth, is key for policymaking.

Key Words: Financial development, economic growth, Sub-Saharan Africa, non-linearity

Eixo Temático 7 : Economia e Empresa

RIVALIDAD Y CICLO DE VIDA EN EL SECTOR AUTOMOVILÍSTICO

FERNANDO CAMPAYO SÁNCHEZ

Universidad de Alicante
Ctra. San Vicente del Raspeig, S/N / 03690-San Vicente del Raspeig (Alicante)

FRANCISCO JOSÉ MAS RUIZ

Universidad de Alicante

JUAN LUIS NICOLAU GONZÁLBEZ

Universidad de Alicante

e-mail Fernando Campayo Sánchez: fernando.campayo@ua.es

Resumen

La gestión de la línea de productos es, hoy en día, indispensable para la empresa (Bayus y Putsis, 1999; Giachetti y Dagnino, 2014; Shankar, 2006). En este campo, una importante línea de investigación se ha centrado en la permanencia de los productos en el mercado, que ha sido explicada a través de factores tales como la edad del producto (Stavins, 1995; Greenstein y Wade, 1998), la tecnología (Bayus, 1998), la cuota de mercado (Asplund y Sandin, 1999; de Figueiredo y Kyle, 2006), el diseño (Cottrell y Nault, 2004), la competencia con otros productos o de otras empresas de la industria (Greenstein y Wade, 1998; Ruebeck, 2002, 2005; de Figueiredo y Kyle, 2006; Requena-Silvente y Walker, 2005, 2009), la rivalidad con artículos de segunda mano (Iizuka, 2007), y la forma de entrada (Khessina y Carroll, 2008).

El presente trabajo tiene por objeto analizar en profundidad como influye la rivalidad en la vida de los productos diferenciados. Para ello se ha llevado a cabo una revisión de la literatura, al objeto de establecer hipótesis de investigación en este campo y, por otro lado, se ha estimado un modelo econométrico que explica la vida del producto de la empresa a través del efecto dinámico de la rivalidad, con datos de panel de las empresas automovilísticas españolas entre 2008 y 2017.

Los resultados muestran un elevado aumento de la rivalidad en el sector del automóvil, manifestado a través del incremento en el número de modelos comercializados, así como en la pérdida de cuota de mercado de las empresas originariamente reguladas en favor de otras procedentes del extranjero. A su vez, las múltiples salidas de modelos detectadas en el lapso temporal analizado sugieren la existencia de ciclos de vida que ponen de manifiesto una obsolescencia planificada de los mismos.

Palabras clave: Ciclo de vida, rivalidad, obsolescencia planificada, industria del automóvil.

Abstract

Product line management is, nowadays, indispensable for company (Bayus and Putsis, 1999; Giachetti and Dagnino, 2014; Shankar, 2006). In this field, an important line of research has focused on the permanence of products in the market, which has been explained through factors such as the age of the product (Stavins puts, 1995; Greenstein and Wade, 1998), the technology (Bayus, 1998), the market share (Asplund and Sandin, 1999; Figueiredo and Kyle, 2006), the design (Cottrell and Nault, 2004), the competition with other products or other companies of the industry (Greenstein and Wade, 1998; Ruebeck, 2002, 2005; Figueiredo and Kyle, 2006; Requena-Silvente and Walker, 2005, 2009), rivalry with second-hand articles (Iizuka, 2007), and the form of entry (Khessina and Carroll, 2008).

The purpose of this work is to analyse in depth how rivalry influences the product life. For this work, it has been examined the literature, in order to establish a theoretical framework that allows to develop research hypothesis in this field and, on the other hand, from a methodological point of view, we have estimated an econometric model which explains the life cycle through the dynamic effect of the rivalry, with panel data of the Spanish automobile companies between 2008 and 2017.

The discoveries show a high increase of the rivalry in the automobile industry, manifested through the increase in the number of commercialized models, as well as in the loss of market share of the originally regulated companies in favour of other coming from abroad. In turn, the multiple outputs of models detected in the time period analysed suggest the existence of life cycles that show a planned obsolescence of them.

Key Words: Life cycle, rivalry, planned obsolescence, automotive industry.

Eje Temático 7 : Economía y Empresa

LA POLÍTICA DE LA UE ANTE LA POBREZA Y LA EXCLUSIÓN SOCIAL. UNA REVISIÓN CRÍTICA.

ANTONIO GARCÍA LIZANA

Departamento de Economía Aplicada (Hacienda Pública, Política Económica y Economía Pública)
Facultad de CC. EE. y EE./Universidad de Málaga/Campus de El Ejido s/n/aglizana@uma.es

JOSÉ LOBATO MARTÍN

Departamento de Economía Aplicada (Estadística y Econometría)/Facultad de CC. EE. y EE.
Universidad de Málaga/Campus de El Ejido s/n/jlobato@uma.es

PABLO PODADERA RIVERA

Departamento de Economía Aplicada (Hacienda Pública, Política Económica y Economía Pública)
Facultad de CC. EE. y EE./Universidad de Málaga/Campus de El Ejido s/n/ppodadera@uma.es

ÁNGEL ROMERO MARTÍN-GAMBERO

Departamento de Economía Aplicada (Hacienda Pública, Política Económica y Economía Pública)
Facultad de CC. EE. y EE./Universidad de Málaga/Campus de El Ejido s/n
angelrmgambero@gmail.com

e-mail Pablo Podadera: ppodadera@uma.es

Resumen

La persistencia de la pobreza y la exclusión social en la UE ha motivado la preocupación por dar una respuesta política consistente, cuyos óptimos resultados se hacen esperar. El objetivo del presente trabajo es identificar dichas líneas de intervención y considerar la evolución de las tasas que miden los fenómenos apuntados, evaluando así su capacidad de impacto de acuerdo con las circunstancias existentes, proponiendo determinadas modificaciones, para lo cual se parte de los documentos oficiales pertinentes, se toma en cuenta el indicador denominado AROPE para medir la evolución, y se analiza la idoneidad de las actuaciones diseñadas hasta el momento a la luz de los hallazgos realizados por el equipo, deduciendo en consecuencia, las modificaciones indicadas. De acuerdo con ello, se ha detectado la existencia de una política diversificada que ha ido cambiando, al mismo tiempo que una persistente desigualdad entre los países de la UE, tanto en los valores del indicador en cada momento como en la evolución experimentada. A la vista de los factores que influyen tal estado de cosas, se señala la necesidad de realizar determinados ajustes que permitan mejorar la situación.

Palabras clave: pobreza, exclusión social, AROPE, UE.

Abstract

The persistence of poverty and social exclusion in the European Union has motivated the concern to give a consistent political response, whose optimal results are expected. The objective of this paper is to identify these lines of intervention and to consider the evolution of the rates that measure the indicated phenomena, evaluating their impact capacity according to the existing circumstances, proposing certain modifications, for that purpose we use the relevant official documents, consider the AROPE indicator for measure the evolution, and the suitability of the actions designed until now with the findings made by the team so we deduce the indicated modifications is analyzed. Accordingly, has been detected the existence of diversified policy has been detected, which has been changing, at the same time as a persistent inequality between the countries of the EU in the values of the indicator and in the evolution experienced. In view of the factors that influence on that state of affairs, the need to make certain adjustments to improve the situation is pointed out.

Key Words: poverty, social exclusion, AROPE, EU.

Eje Temático 1 : Economía Internacional

EFICIENCIA TÉCNICA DE PESQUERÍAS CON HETEROGENEIDAD INOBSERVADA

DAVID CASTILLA ESPINO

Departamento de Economía/Facultad de Ciencias Empresariales/Universidad de Huelva
Plaza La Merced, 11. 21071-Huelva

JUAN JOSÉ GARCÍA DEL HOYO

Departamento de Economía/Facultad de Ciencias Empresariales/Universidad de Huelva
Plaza La Merced, 11. 21071-Huelva

e-mail David Castilla Espino: david.castilla@dehie.uhu.es

Resumen

La pesquería de Boquerón del sureste del Mar Negro localizado en la ZEE de Georgia la explotan buques Georgianos y turcos. Su evolución histórica se caracteriza por la sobrecapacidad y consecuentemente sobreexplotación como consecuencia de la existencia de un marco de gestión inapropiado. Además, la información disponible es escasa lo que dificulta poner en marcha un marco de gestión que garantice la sostenibilidad; además de llevar a la existencia de una importante heterogeneidad inobservada. Esta comunicación tiene por objeto medir la eficiencia técnica de esta flota en el período 2005–2009 mediante un modelo de frontera estocástica de clase latente que tenga en cuenta esta heterogeneidad inobservada (Alvarez y Del Corral, 2010; Orea y Kumbhakar, 2004). Los resultados proporcionan información relevante para la gestión de la pesquería en relación con la eficiencia técnica y el patrón de su distribución en la flota; y la tecnología de la producción. Los resultados preliminares muestran que la eficiencia técnica media es de alrededor del 55%. Además, los datos de la muestral ponen de manifiesto la existencia de 2 clases claramente diferenciadas.

REFERENCIAS

ÁLVAREZ, A., DEL CORRAL, J. (2010). Identifying different technologies using a latent class model: Extensive versus intensive dairy farms. *European Review of Agricultural Economics* 37, 231-250. <https://doi.org/10.1093/erae/jbq015>

OREA, L., KUMBHAKAR, S.C. (2004). Efficiency measurement using a latent class stochastic frontier model. *Empirical Economics* 29, 169-183. <https://doi.org/10.1007/s00181-003-0184-2>

Palabras clave: eficiencia, pesquerías, boquerón, heterogeneidad inobservada.

Eje Temático 10 : Economía Azul. Del Mar y Actividades Marítimas

Abstract

Southeastern Black Sea anchovy fishery stock in the Economic Exclusive Zone (EEZ) of Georgia is exploited by Georgian and Turkish vessels. Historical evolution of this fishery is characterized by a process of overcapacity and consequently overexploitation which results from a limited management framework. Additionally, this fishery is also characterized by the lack of information available what makes more difficult imposing proper management measures aimed at sustainability; and is a source of unobserved heterogeneity of fisheries production which includes different fishing gears. This paper is aimed at measuring production efficiency of this fleet in the period 2005–2009 using econometric techniques accounting for production heterogeneity. A stochastic frontier latent class model is estimated at this aim (Alvarez y Del Corral, 2010; Orea y Kumbhakar, 2004). Results provide sound scientific advice for the management of this fishery on technical efficiency of the fleet and the patterns of its distribution among it, and the technology of production. Some preliminary results using standard stochastic frontier methods show a mean technical efficiency level around 55%. Moreover, sample composition evidence the coexistence of 2 classes of technologies.

REFERENCES

- ÁLVAREZ, A., DEL CORRAL, J. (2010). Identifying different technologies using a latent class model: Extensive versus intensive dairy farms. *European Review of Agricultural Economics* 37, 231-250. <https://doi.org/10.1093/erae/jbq015>
- OREA, L., KUMBHAKAR, S.C. (2004). Efficiency measurement using a latent class stochastic frontier model. *Empirical Economics* 29, 169-183. <https://doi.org/10.1007/s00181-003-0184-2>

Key Words: efficiency, fisheries, anchovy, unobserved heterogeneity.

Thematic Area 10 : Blue Economy. The Sea and Maritime Activities.

LAS COMUNIDADES DE PESCADORES: DEFINICIÓN, IDENTIFICACIÓN Y CLASIFICACIÓN

IKERNE DEL VALLE ERKIAGA

Dto. Economía Aplicada V (UPV/EJU)
Lehendakari Agirre 83, 48015, Bilbao

KEPA ASTORKIZA IKAZURIAGA

Dto. Economía Aplicada V (UPV/EJU)
Lehendakari Agirre 83, 48015, Bilbao

e-mail Ikerne del Valle: Ikerne.delvalle@ehu.eus

Resumen

España es una de las principales potencias pesqueras europeas. Aglutina el 19% de la pesca industrial de la UE, y ocupa el puesto 19 del ranking mundial con el 1.14% de las capturas. Cuenta con la flota más importante en términos de capacidad (21,2%) y es la tercera en número de embarcaciones (11%). Además, genera el 31% del empleo pesquero de la UE (Informe SOFIA, 2018; MAPA, 2018). Sin embargo, el sector no está homogéneamente distribuido por el litoral del estado español. Además, aunque la actividad pesquera raramente representa un porcentaje que alcance los dos dígitos en el PIB, sin embargo, a nivel local, la pesca es una actividad económica vital que condiciona la evolución y la supervivencia de las comunidades pesqueras (CPs). Abundan los trabajos en los que se analiza la evolución de la pesca en las comunidades autónomas de referencia (Varela et al. (2015), Pita et al. (2018), García et al. (2016), del Valle et al. (2008), Prellezo et al. (2007), Lostado (1997; 2000), Pascual (1991; 2003) y/o principales pesquerías, (Garza et al. Castilla et al., 2015, Rodríguez et al (2012)), pero no nos consta ninguno en el cual se aborden los aspectos socioeconómicos de la pesca desde una perspectiva local que aglutine la totalidad de CPs de España.

Nos proponemos cubrir este vacío mediante la aportación del *atlas de España de las comunidades pesqueras* (CP), lo cual implica en primer lugar definir, para posteriormente identificar y clasificar las CPs a partir de un *indicador compuesto* basado en un conjunto de indicadores primarios tanto numéricos (i.e. output (capturas), input (buques), trabajo (pescadores) como no numéricos (i.e. presencia o ausencia de puntos de venta de pescado, instituciones vinculadas con el sector etc.); e indicadores derivados del cruce de las variables primarias anteriormente apuntadas (i.e. % de pescadores en relación al censo municipal, estructura de la edad de la flota, predominancia de la flota artesanal o industrial etc.). Esta aproximación local nos permitirá analizar algunas de las claves que condicionan la vulnerabilidad de las CPs en un marco general caracterizado por el declive y abandono de la actividad pesquera, la falta de relevo generacional y el desarrollo del turismo como actividad complementaria y/o sustitutiva de la pesca profesional.

A partir del análisis precedente derivaremos el ranking o posición relativa que cada CP ocupa en el conjunto de CPs del estado español. Con el fin de dotar al análisis de una mayor robusted, además de la media generalizada (o media de Hölder) se tendrán en cuenta indicadores compuestos más novedosos tales como: la propuesta de ponderación

de la OCDE (2008) basada en el análisis factorial que agrupa los indicadores simples colineales para estimar un indicador compuesto que recoge la mayor cantidad posible de la información común, el índice Mazziotta-Pareto (De Muro et al, 2011) o la familia de indicadores compuestos basados en la aproximación del beneficio de la duda (BoD) inicialmente propuesto por Melyn and Moesen (1991) y posteriormente desarrollado por Witte y Rogge (2009) (la aplicación del análisis envolvente de datos (DEA) en el campo de indicadores compuestos), el BoD restringido de Van Puyenbroeck y Rogge (2017) cuya principal ventaja es que permite introducir restricciones adicionales a la variación de peso en el procedimiento de optimización y el BoD restringido bajo presencia de indicadores no deseados (Rogge, et al. 2017).

Palabras clave: Pesca, Comunidades Pesqueras, Priorización, Indicadores Compuestos.

Eje Temático 10 : Economía Azul. Del Mar y Actividades Marítimas

THE ECONOMIC COST OF THE ARAB SPRING: THE CASE OF THE EGYPTIAN REVOLUTION

CRUZ ÁNGEL ECHEVARRÍA

Dpto. Fundamentos del Análisis/Universidad del País Vasco UPV/EHU
Avda. Lehendakari Aguirre 83. 48015 Bilbao/cruz.echevarria@ehu.eus

JAVIER GARCÍA ENRÍQUEZ

Dpto. Economía Aplicada III (Econometría y Estadística)/Universidad del País Vasco UPV/EHU
Avda. Lehendakari Aguirre 83. 48015 Bilbao/javier.garcia@ehu.eus

e-mail Javier García: javier.garcia@ehu.eus

Abstract

This paper analyzes the effects that the Arab Spring and the subsequent revolution had on per capita real Gross Domestic Product in Egypt. The estimation procedure that we follow is the *synthetic control method*. After comparing the observed evolution of Egyptian real output in the period 2011–2017 with that of synthetic Egypt, our estimates show (i) an accumulated loss in the growth rate of per capita real Gross Domestic Product of 12.04% (a yearly average of 1.56%); (ii) an accumulated loss in the per capita real Gross Domestic Product of 6279.7 dollars (a yearly average of 897.1 dollars); and (iii) an accumulated loss in the aggregate real Gross Domestic Product of 582.5 billion dollars (a yearly average of 83.2 billion dollars).

Key Words: Case study, Synthetic control method, Treatment effect, Arab Spring, Egypt.

Eje Temático 1 : Economía Internacional



LA SOSTENIBILIDAD FISCAL EN AMÉRICA LATINA

ESTHER BARROS-CAMPELLO

Facultad de Economía y Empresa/Departamento de empresa/Universidade da Coruña
Campus de Elviña, s/n; 15071; A Coruña/esther.barros@udc.es

e-mail Esther Barros-Campello: esther.barros@udc.es

Resumen

El problema de la sostenibilidad fiscal es un tema ampliamente estudiado en la literatura económica. El objetivo de este trabajo es analizar la sostenibilidad de las finanzas públicas de los cuatro países de América Latina que ocupan los primeros puestos en cuanto a volumen de exportaciones de petróleo: Venezuela, México, Colombia, Brasil. El análisis se realiza con base en pruebas de raíces unitarias y cointegración.

Palabras clave: política fiscal, sostenibilidad fiscal, petróleo, cointegración.

Abstract

The problem of fiscal sustainability is a widely studied topic in economic literature. The objective of this work is to analyze the sustainability of public finances in four Latin American countries: Venezuela, Mexico, Colombia, Brazil. They occupy the first places in terms of volume of oil exports: Venezuela, Mexico, Colombia, Brazil. The analysis is based on unit root tests and co-integration.

Key Words: fiscal policy, fiscal sustainability, oil, co-integration.

Eje Temático 7 : Economía y Empresa

AN EFFICIENT PORTFOLIO APPROACH TOWARDS ECOSYSTEM BASED FISHERIES GOVERNANCE IN EU

ITSASO LOPETEGUI

Faculty of Economics and Business (Sarriko)/Department of Applied Economics V
University of the Basque Country (UPV/EHU)
Avenida Lehendakari Agirre 83, 48015 Bilbao (Vizcaya)/itsaso.lopetegui@ehu.eus

IKERNE DEL VALLE ERKIAGA

Faculty of Economics and Business (Sarriko)/Department of Applied Economics V
University of the Basque Country (UPV/EHU)
Avenida Lehendakari Agirre 83, 48015 Bilbao (Vizcaya)/ikerne.delvalle@ehu.eus

Abstract

In the framework of modern portfolio theory (MPT) and ecosystem based approach to multispecies fisheries governance, the main objective of this paper is to apply MPT to the North-East Atlantic European fisheries. This is done by quantifying the inherent risk and return of the European potential fish portfolios and to provide advice to policy makers so as to improve fisheries management. The case study covers all the 49 fish species subject to total allowable catch (TAC) and quota regimes within the EU during the period 2000-2016. Since the CVaR optimization process is more robust than the conventionally used Mean-Variance Optimization (MVO), we are using the Conditional Value-at-Risk (CVaR) as the method to solve the inherent optimization problem of minimizing risk under alternative CVaR constraints and return levels. Based on our analysis, potential species portfolio distribution changes implying efficiency gains (measured as increasing returns and decreasing risk levels) are discussed.

Key Words: Ecosystem based approach to multispecies fisheries governance, Portfolio Theory, Risk, Return.

Area or Thematic axis 10 : Blue Economy. Sea and Maritime Activities

SISTEMA PORTUARIO Y DESARROLLO SOSTENIBLE: ANÁLISIS DE LA ECOEFICIENCIA EN LOS PUERTOS ESPAÑOLES DE INTERÉS GENERAL

FEDERICO MARTÍN BERMÚDEZ

Programa de doctorado en Economía y Empresa/Universidade de Santiago de Compostela
federico.martin@rai.usc.es

FERNANDO GONZÁLEZ LAXE

Departamento Economía/Universidade da Coruña
laxe@udc.es

EVA AGUAYO LORENZO

Departamento Economía Cuantitativa/Universidade de Santiago
eva.aguayo@usc.

e-mail Federico Martín Bermúdez: federico.martin@rai.usc.es

Resumen

El sistema portuario español de interés general está compuesto por 28 Autoridades Portuarias (AAPP) que gestionan 46 puertos. Su coordinación y control corresponde al Organismo Público Puertos del Estado, órgano dependiente del Ministerio de Fomento y que tiene atribuida la ejecución de la política portuaria del Gobierno. La actividad de este sistema portuario representa el 1,1% del PIB español y el 20% del correspondiente al sector del transporte.

Las instalaciones de estos puertos comprenden más de 10.000 hectáreas de área de servicio de las cuáles más de un 60% se encuentra ocupado por instalaciones activas (propias o en concesión). En 2018 movieron más de 563,4 millones de toneladas de mercancías y 36 millones de pasajeros.

La Ley 33/2010, de 5 de agosto, de Puertos del Estado y de la Marina Mercante (Texto refundido por Real Decreto 2/2011) atribuye a las AAPP la gestión y administración de sus recursos en el marco de eficacia, eficiencia y sostenibilidad ambiental. Al mismo tiempo, contempla la necesidad de que los puertos vayan incorporando sistema de gestión basados en los principios del desarrollo sostenible y adopten las medidas necesarias para promover las mejoras en las prácticas ambientales. El establecimiento de la obligatoriedad legal de que cada AP elabore una Memoria de Sostenibilidad Ambiental con carácter anual, se conforma como un elemento esencial de seguimiento, promoción y control de cada una de las políticas y medidas adoptadas.

La presente investigación tiene como objetivo, partiendo de la creación y explotación de una base con los datos provenientes de dichas Memorias de Sostenibilidad, el análisis de indicadores de ecoeficiencia en los puertos españoles de interés general, su evolución temporal y los resultados de las estrategias adoptadas.

Palabras Clave: desarrollo sostenible, sistema portuario, indicadores, ecoeficiencia, España.

Abstract

The Spanish port system of general interest is made up of 28 Port Authorities (AAPP) that manage 46 ports. Its coordination and control corresponds to the Public Body Ports of the State, body dependent of the Ministry of Fomentation and which has attributed the execution of the port policy of the Government. The activity of this port system represents 1.1% of the Spanish GDP and 20% of the corresponding to the transport sector.

The facilities of these ports comprise more than 10,000 hectares of service area of which more than 60% is occupied by active facilities (own or concession). In 2018 moved more than 563.4 million tons of goods and 36 million passengers.

Law 33/2010, of 5 August, of Ports of the State and of the Merchant Marine (Text recast by Royal Decree 2/2011) attributes to the AAPP the management and administration of its resources in the framework of efficiency, efficiency and environmental sustainability. At the same time, it contemplates the need for ports to incorporate management system based on the principles of sustainable development and take the necessary steps to promote improvements in environmental practices. The establishment of the legal obligation for each AP to develop an annual Report of Environmental Sustainability, is formed as an essential element of monitoring, promotion and control of each of the policies and measures adopted.

This research aims, starting from the creation and exploitation of a base with the data from these Sustainability Reports, the analysis of indicators of eco-efficiency in the Spanish ports of general interest, its evolution And the results of the strategies adopted

Key Words: Sustainable development, port system, indicators, eco-efficiency, Spain.

Eje Temático 10 : Economía Azul. Del Mar y Actividades Marítimas

PROBABILIDAD INDIVIDUAL DE DESEMPLEO DURANTE LA GRAN RECESIÓN EN ESPAÑA

MARÍA LUCÍA NAVARRO GÓMEZ

Departamento de Estadística y Econometría/Facultad de CC. Económicas y Empresariales
Universidad de Málaga/l_navarro@uma.es

MARIO F. RUEDA NARVÁEZ

Departamento de Estadística y Econometría/Facultad de CC. Económicas y Empresariales
Universidad de Málaga/mfrueda@uma.es

e-mail Mario F. Rueda Narváez: mfrueda@uma.es

Resumen

El alto nivel de desempleo es uno de los principales problemas económicos de España, con una situación notablemente peor en los últimos años que en otros países desarrollados. En septiembre de 2017, según datos de Eurostat, la tasa de paro española destacaba en el contexto europeo con un 16,5%, muy por encima de la media del 7,9%, y sólo por debajo de la de Grecia. Pese a la evolución positiva tras el máximo del 27% en 2013, la economía sigue lejos de la situación de 2007, antes del comienzo de la crisis, en la que una tasa de paro del 8,2% se situaba apenas un punto por encima de la media europea. Las diferencias, sin embargo, son menores si se mide el rendimiento del mercado de trabajo mediante la tasa de empleo, que a mediados de 2017 era en España de un 61,1%, frente a una media del 66,7%.

Estos datos llevan a plantearse si esta elevada tasa de paro responde a dificultades generalizadas para encontrar empleo para todos los trabajadores por igual, o si bien existen diferencias entre distintos grupos, en función de características socioeconómicas como el nivel educativo, el género o la edad de los activos, entre otras. El presente trabajo utiliza datos de la EPA desde 2005 hasta 2017 para analizar cómo las características individuales de los trabajadores afectan a la probabilidad de que estén parados frente a ocupados, y cómo tales efectos han evolucionado desde el comienzo de la crisis. Los resultados permiten identificar los grupos con mayores problemas de desempleo y qué colectivos han encontrado mayores dificultades relativas para acceder al empleo en los últimos años.

Palabras clave: Desempleo, Educación, Modelos *logit*.

Abstract

High unemployment remains one of the main economic problems of Spain, which has sustained in the last years a much higher level of joblessness than similar developed countries. In September 2017, according to Eurostat data, the Spanish unemployment rate stood at 16.5%, about double the EU mean of 7.9% and second only to Greece. While progress has been made since 2013, when unemployment reached a high of 27%, the labour market has not fully recovered and is still far from the 2007 unemployment low of

8.2%, which was then just one percentage point above the European average. However, when the strength of the labour market is measured by the share of adults in employment, the international comparison is somewhat less bleak: in mid-2017 the Spanish employment rate was 61.1%, while the EU mean stood at 66.7%.

One important question arising from these figures is whether this high unemployment rate reflects broad difficulties that affect all adults when finding and keeping jobs, or whether different groups of workers fare differently, depending on their level of education, age or gender, among other socio-economic characteristics. This paper aims to estimate how these individual variables affect the probability of being unemployed for those economically active, and how these effects have evolved in the years since the beginning of the Great Recession. To do so, we use Labour Force Survey (EPA) data from 2005 to 2017 to estimate unemployment probability models and compare the result across different time periods. Our results allow us to identify which groups of the workforce currently find it most difficult to be employed, and which ones have faced the lowest employment probabilities during the crisis.

Key Words: Unemployment, Education, Logit models.

Eje Temático 9 : Economía Cuantitativa. Para la Economía y la Empresa

ESTIMACIÓN DE RATINGS DE DEUDA SOBERANA EN LA UE15 DE 2002 A 2017 MEDIANTE CLASIFICADORES ORDINALES

CARLOS GALNARES JIMENEZ-PLACER

Departamento Métodos Cuantitativos/Universidad Loyola Andalucía
Energía Solar 1, 41004 Sevilla/cgalnaresjimenez@al.uloyla.es

ALFONSO CARLOS MARTÍNEZ ESTUDILLO

Departamento Métodos Cuantitativos/Universidad Loyola Andalucía
Energía Solar 1, 41004 Sevilla/acme@uloyla.es

MARIANO CARBONERO RUZ

Departamento Métodos Cuantitativos/Universidad Loyola Andalucía
Energía Solar 1, 41004 Sevilla/mcarbonero@uloyla.es

e-mail Carlos Galnares Jiménez-Placer: cgalnaresjimenez@al.uloyla.es

Resumen

Existen diversos trabajos en los que se pretende estimar el rating de la deuda soberana sobre distintos grupos de países a través de diversas técnicas y variables macroeconómicas.

En este trabajo los ratings se estiman mediante distintos clasificadores ordinales y variables seleccionadas a través de un marco conceptual. Esto se hace en un grupo de países con una política económica común, los 15 países que conformaban la UE en el año 2000, y en un periodo de tiempo largo, de 2002 a 2017, que incluye una profunda crisis económica que ha impactado de forma diferente en los países analizados y sus ratings.

Con una metodología de clasificación rigurosa y validaciones cruzadas se obtienen unos resultados de clasificación homologables a otros trabajos que utilizan un mayor número de variables.

Palabras clave: Estimación rating deuda soberana, Teorías sobre la dinámica de la deuda, Aprendizaje automático, clasificador ordinal.

Abstract

Several articles analyze the possibility of estimating sovereign debt ratings through different methodologies and macroeconomic variables.

In this work, the rating estimation is made through ordinal classifiers and the variables are chosen from a conceptual framework.

This is done in a group of countries with a common economic policy, the 15 countries of the EU in the year 2000, and over a long period of time, from 2002 to 2017, that includes a deep crisis that impact in the countries analyzed and their rating in a different way.

Using rigorous classification techniques and cross-validation, it is achieved excellent classification results, like jobs in which a greater number of variables.

Key Words: sovereign rating estimation, debt dynamic theories, machine learning, ordinal classifier.

Eje Temático 9 : Economía Cuantitativa. Para la Economía y la Empresa

MERCADO DE TRABAJO Y RELACIONES LABORALES EN ALEMANIA: ANATOMÍA DE UN PROCESO DE DUALIZACIÓN

DANIEL HERRERO ALBA

Universidad Complutense de Madrid/Instituto Complutense de Estudios Internacionales
Finca Mas Ferré, Edificio A/Campus de Somosaguas, entrada 3/28223 Pozuelo de Alarcón (Madrid)
d.herrero@ucm.es

Resumen

La transformación del modelo Alemán de mercado de trabajo y relaciones laborales ha sido interpretada por parte de la literatura como un proceso de dualización. Empleando la base de datos IAB Establishment Panel, este trabajo tiene como objetivo testar dos aspectos de esta tesis: (1) la emergencia de un núcleo coordinado de en el que las instituciones tradicionales han permanecido inalteradas; y (2) el papel del cambio estructural (desindustrialización) en el proceso. Para ello, empleando las variables sector de actividad, tamaño y localización geográfica, se diseñan doce tipos de empresas, y se analiza descriptivamente la evolución de cuatro formas de empleo atípico () y la tasa de cobertura de la negociación colectiva y los comités de empresa. A continuación, se aplica una técnica de descomposición (Sharpe, 2009) para cuantificar las contribuciones de cada uno de los tipos de empresa a la erosión del modelo y para conocer el impacto del cambio estructural. Nuestros resultados revelan que (a) el estado actual del modelo está definido por la presencia de un centro, una periferia y una semiperiferia de empresas; y que (b) el cambio estructural ha jugado un rol menor en el proceso.

Palabras clave: Relaciones laborales, Mercado de trabajo, Empleo atípico, Alemania, Cambio institucional

Abstract

The transformation of the German employment and industrial relations model has been read by some scholars as a process of dualization. Using the IAB Establishment Panel, this paper empirically tests two aspects of this thesis: (1) the appearance of an economic core, where traditional institutions remain intact, and a periphery, in which institutional change is concentrated; and (2) the key role of structural change in the process. For this purpose, twelve establishment types are built on the basis of three variables (industry, region and size), and a descriptive analysis of the evolution of atypical employment and the joint presence of collective agreement and work councils is performed. Then, a decomposition technique (Sharpe, 2009) is used to quantify the contributions of each establishment type regarding the erosion of the model and to measure the impact of the structural change. Our findings reveal that (a) the current status of the model is defined by the presence of a core, a periphery and a semiperiphery of establishments; and (b) structural change has played a minor role in the process.

Key Words: Industrial Relations, Labor market, Atypical employment, Germany, Institutional change.

Eje Temático 1 : Economía Internacional

EFFECTOS MACROECONÓMICOS DE LA REDUCCIÓN DEL TIEMPO DE TRABAJO EN LA ECONOMÍA ESPAÑOLA

LUIS CÁRDENAS DEL REY

Instituto Complutense de Estudios Internacionales (ICEI)
luiscard@ucm.es

PALOMA VILLANUEVA CORTÉS

Instituto Complutense de Estudios Internacionales (ICEI)
pvillanuevacortes@gmail.com

e-mail Luis Cárdenas del Rey: luiscard@ucm.es

Resumen

Este artículo analiza el efecto de una reducción del tiempo de trabajo (RTT) en la economía española. Usando microdatos de la Encuesta de Población Activa (EPA) y la Encuesta de Estructura Salarial (ESS), estimamos los cambios en el empleo, las horas trabajadas, los sueldos y salarios, y la participación salarial impulsada por una reducción del tiempo de trabajo semanal ordinario a tiempo completo en 5 horas (40 horas a 35 horas), sin ninguna reducción salarial.

De acuerdo con nuestros resultados, esta RTT implica una liberación de horas del sector privado equivalente a 1.2 millones de empleos de tiempo completo. Para calcular la creación neta de empleos, consideramos la asignación sectorial del empleo, los factores geográficos y la complejidad de las tareas (según la Encuesta Europea sobre Condiciones de Trabajo). En consecuencia, si la RTT hubiera tenido lugar en 2017, habría creado como máximo 600 mil empleos, lo que provocaría que la tasa de desempleo cayera en 2.6% puntos. Además, las mujeres son las más afectadas por esta medida.

En cuanto al efecto sobre los salarios, estos aumentarían en un 4,5%, lo que implicaría un aumento de la participación salarial de 2,3 pp. Finalmente, estudiamos sus efectos macroeconómicos, a través de una versión extendida del modelo Bhaduri-Marglin de ecuaciones únicas con datos trimestrales desde 1995q1 hasta 2017q4. Nuestros resultados muestran que un WTR de 5 horas conduce a un aumento del 1.8% en el PIB.

Palabras clave: Bhaduri-Marglin, economía española, reducción del tiempo de trabajo, mercado laboral.

JEL Code: C22, E22, E32

Abstract

This paper analyzes the effect of a working time reduction (WTR) in the Spanish economy. Using microdata from the Economically Active Population Survey (EAPS) and the Wage Structure Survey (WSS), we estimate the changes in employment, worked hours, wages and salaries, and the wage share driven by an ordinary weekly working time in full time contracts reduction of 5 hours (40 hours to 35 hours), without any wage reduction.

According to our results, this WTR implies a private sector hours liberation equivalent to 1.2 million full-time jobs. To calculate net job creation, we consider sectoral allocation of employment, geographical factors and the complexity of the tasks (based on the European Working Conditions Survey). Consequently, had the WTR taken place in 2017, would it have created almost 600 thousand jobs, thus making the unemployment rate fall by 2.6% points. Moreover, women are found to be the most affected by this measure.

As for the effect on wages, these would increase by 4.5%, implying a wage share increase of 2.3 pp. Finally, we study its macroeconomic effects, through an extended version of the single-equations Bhaduri-Marglin model with quarterly data from 1995q1 until 2017q4. Our results show that a WTR of 5 hours leads to an increase of 1.8% in GDP.

Key Words: Bhaduri-Marglin, Spanish economy, Work-time reduction, Labor market.

JEL Code: C22, E22, E32

Eje Temático 9 : Economía Cuantitativa. Para la Economía y la Empresa

MODELOS DE DUALIDAD DEL MERCADO DE TRABAJO Y CRECIMIENTO DE LOS SALARIOS EN ECONOMÍAS AVANZADAS

JULIÁN LÓPEZ GALLEGO

Departamento de Economía Aplicada, Estructura e Historia, UCM/Instituto Complutense de Estudios Internacionales (ICEI)/Finca Mas Ferré/jlgallego@ucm.es

e-mail Julián López Gallego: jlgallego@ucm.es

Resumen

En este trabajo tratamos de explorar la dualidad del mercado laboral en relación con dos asuntos. Primero, la dualización del mercado laboral se encuentra estrechamente vinculada con la segmentación del sistema de relaciones laborales y la generosidad de las políticas del estado del bienestar dirigidas a los *outsiders*. Segundo, la expansión del segmento secundario del mercado de trabajo o, lo que es lo mismo, la creciente incidencia de formas atípicas de empleo, menos protegidas frente al despido y con mayor vulnerabilidad de ingresos, parece haber tenido efectos depresivos sobre la tasa de variación de los salarios nominales. Nuestro estudio parte de la elaboración de un indicador compuesto basado en la incidencia real de los *outsiders*, que permite observar la evolución del nivel de dualidad durante más de 20 años para un conjunto amplio de economías avanzadas. Esto ha permitido la comparación de modelos de dualidad y el estudio de su impacto en el comportamiento de los salarios mediante la estimación de un modelo de STSC. Con ello, podemos trazar tres conclusiones principales. La primera de ellas es que, aunque tras la crisis se ha registrado un aumento generalizado de la dualidad del mercado laboral, no solo persisten, sino que se han acentuado las diferencias de grado entre las distintas variedades nacionales de capitalismo. La segunda es que, cuando además se consideran otros procesos de polarización de áreas institucionales relacionadas, pueden constatarse distintos tipos de dualidad que se corresponden con variedades nacionales de capitalismo y que implican distintos niveles de desprotección de los *outsiders*. Finalmente, constatamos que el incremento en la dualidad del mercado laboral y el descenso en la generosidad del estado del bienestar con los *outsiders* ha tenido un impacto significativo en el descenso en el crecimiento de los salarios en la década posterior a la Gran Recesión.

Palabras clave: mercado de trabajo, economías avanzadas, dualización, salarios, variedades de capitalismo.

Abstract

In this study, labour market dualization is linked with two important issues. On the one side, we explore the relation between dual labour markets, industrial relations segmentation and welfare state generosity. On the other side, the enlargement of secondary labour market, i.e.,

the growing incidence of atypical employment implies less protected jobs with greater risk of low incomes. As a result, a majority of advanced economies have registered less wage pressure and, consequently, a slowdown in the rate of change of nominal wages. To analyze these questions, we construct a composite index based on the real incidence of *outsiderness* for 20 years in 21 advanced economies. This let us compare varieties of dualization and estimate its impact on wages using a TSCS model. Our work states three main conclusions. First of all, after the Great Recession, a vast majority of economies have registered an increase in labour market dualism, but it exists even a greater heretogeneity in its level across economies. The second conclusion points to the existence of different varieties of dualization, which rest on the interaction between labour market dualism and welfare state generosity. In addition, these relations are linked with national varieties of capitalism and imply different levels of *outsiders* vulnerability. Finally, the results confirm a significant impact of labour market dualism and welfare state generosity on the rate of change of nominal wages after the Great Recession.

Key Words: labour market, advanced economies, dualization, wage growth, varieties of capitalism.

Eje Temático 1 : Economía Internacional

UNA MEDIDA DE LOCALIZACIÓN ROBUSTA A PARTIR DEL ÍNDICE DE GINI

JOSÉ E. ROMERO-GARCÍA

Dpto. Economía Aplicada I/Universidad de Sevilla.
Avda. Ramón y Cajal Nº 1. 41018-Sevilla/romerogje@us.es

JAVIER GAMERO-ROJAS

Dpto. Economía Aplicada I/Universidad de Sevilla.
Avda. Ramón y Cajal Nº 1. 41018-Sevilla/jgam@us.es

LUIS SÁNCHEZ-REYES FERNÁNDEZ

Dpto. Economía Aplicada I/Universidad de Sevilla.
Avda. Ramón y Cajal Nº 1. 41018-Sevilla/luiss-rf@us.es

e-mail José E. Romero-García: romerogje@us.es

Resumen

La obtención de estimadores que sean estables en presencia de observaciones outliers es un objetivo importante. En este trabajo, los autores construyen un conjunto de medidas estadísticas que se definen usando esquemas de pesos relacionados con el índice de Gini y que representan diferentes niveles de robustez para la estimación del valor central de una distribución. Partiendo del índice de Gini y de la media equivalente se define una medida de localización central tal que, en distribuciones simétricas con alta curtosis, esta medida es un mejor estimador de la media poblacional que la media muestral y otros estimadores usuales cuando una función de pérdida cuadrática es usada.

Palabras clave: Medida de localización central, Media equivalente, Desigualdad, Estimador robusto del valor central.

Abstract

The stability of the estimators under the presence of outlier values in the samples is indisputable. In this paper, the authors consider a set of statistical measures defined using weighting schemes related to the Gini Index that represent various levels of robustness when estimating the central value of a distribution. Starting from the concepts of the Gini index and the equivalent mean, a measure of central location is defined such that, in symmetrical distributions with high kurtosis, this measure is a better estimator of the population mean than the sample mean estimator and other usual estimators when a quadratic loss function is used.

Key Words: Central location measure, Equivalent mean, Inequality, Robust estimator of the central value.

Eje Temático 9 : Economía Cuantitativa para la Economía y la Empresa.

IS 'BAUMOL'S GROWTH DISEASE' INCREASINGLY UNDERMINING THE U.S. ECONOMY?

ADRIÁN RIAL QUIROGA

Facultad de Ciencias Económicas y Empresariales/Departamento de Economía Aplicada, Estructura e Historia/Universidad Complutense de Madrid
Campus de Somosaguas, Pozuelo de Alarcón, Madrid 28223/arial@ucm.es

e-mail Adrián Rial Quiroga: arial@ucm.es

Resumen

En este trabajo se analiza la evolución de la 'enfermedad del crecimiento de Baumol' en la economía estadounidense durante las tres últimas décadas (1988-2016). Con dicho fin, aplicamos una nueva fórmula de descomposición shift-share que genera contribuciones aditivas y plausibles en términos económicos en un marco de índice encadenado de Fisher. Nuestros resultados confirman que la economía estadounidense ha sufrido la 'enfermedad del crecimiento de Baumol'. Con todo, esta enfermedad es pequeña y no se agrava a lo largo del tiempo. Esto se debe a que dos asunciones del modelo de Baumol no se cumplen, conteniendo la expansión relativa de las industrias estacionarias sobre el producto nominal: 1) el crecimiento del output real de las industrias estacionarias se estanca y, en consecuencia, no iguala el ritmo de crecimiento del output real de las industrias progresivas y 2) las industrias progresivas no trasladan íntegramente sus ganancias de productividad a las industrias estacionarias.

Palabras clave: Enfermedad de Baumol, Crecimiento de la productividad, Análisis shift-share, Economía de Estados Unidos.

Abstract

This study examines 'Baumol's growth disease' evolution in the U.S. economy during the last three decades (1988-2016). To that end, we apply a state-of-the-art shift-share decomposition formula that gives almost exactly additive contributions and plausible economic interpretations in a chained Fisher index framework. We find that the U.S. economy has indeed suffered the disease. However, 'Baumol's growth disease' is small in magnitude and does not follow an increasing trend. This result arises from the fact that two assumptions in Baumol's model do not hold, restraining the expansion of stagnant industries in total nominal value added: 1) real output of stagnant industries stagnates and, consequently, does not keep pace with real output of progressive industries and 2) progressive industries do not fully share their productivity gains with stagnant industries.

Key Words: Baumol's disease, Productivity growth, Shift-share analysis, U.S. economy.

Eje Temático 1 : Economía Internacional

DESCOMPOSICIÓN SIMULTANEA DE LA DESIGUALDAD POR SUBGRUPOS Y FUENTES DE RENTA. REDISTRIBUCIÓN POR REGIONES EN ECUADOR

MIGUEL ÁNGEL TOMALÁ PARRALES

Facultad de Ciencias Económicas/Universidad Laica Eloy Alfaro de Manabí-Ecuador
Circunvalación – Vía San Mateo, Manta – Manabí – Ecuador/migueltomal@yahoo.com

JUAN VICENTE PERDIZ

Departamento de Economía Aplicada/Universidad de Valladolid
perdiz@eco.uva.es

e-mail Miguel Ángel Tomalá Parrales: migueltomal@yahoo.com

Resumen

La globalización favorece la convergencia entre países hacia mayores niveles de renta y de desigualdad (Bourguignon 2017). No obstante, aún se observan notables diferencias en los niveles de desigualdad entre países. Las diferencias se deben, no tanto a la distribución de las rentas primarias, del trabajo y del capital, que son bastante dispares en todos los países, sino a la magnitud y progresividad de las rentas secundarias, prestaciones menos impuestos, que todavía difieren bastante entre países. (OCDE, 2018)

Tradicionalmente los estudios sobre la distribución de la renta entre países y regiones y los que tratan la distribución y redistribución de la renta entre personas, han perseguido objetivos diferentes y empleado métodos distintos (Cowell, 2011). Actualmente las barreras se están difuminando con la propuesta de nuevos métodos (Fortin et al, 2012), de intentos de unificación (Shorrocks, 2013), o descomposición conjunta de índices concretos (Mussard, 2004, Gianmatteo, 2007, Mussini, 2013 o Parmet and Schechtman, 2017).

Sobre la base de las anteriores aportaciones en este trabajo llevamos a cabo una descomposición conjunta por regiones y fuentes de renta para diferentes medidas de desigualdad, aplicada al caso de Ecuador empleando los microdatos de la última encuesta de hogares disponible ENIGHUR 2011-2012. Entre los resultados obtenidos destaca como la distribución las rentas secundarias tienen un menor protagonismo que el de las rentas primarias a la hora de explicar las diferencias de niveles de desigualdad entre regiones. La confirmación de dichos resultados a las regiones de otros países y su contraste con los observados en las comparaciones internacionales permitiría derivar algunas implicaciones de interés sobre la carencia de instituciones supranacionales.

Palabras clave: Descomposición de la desigualdad, redistribución, desigualdad regional, Ecuador.

Abstract

Globalization promotes the convergence between countries towards higher levels of income and inequality (Bourguignon 2017). However, there are still significant differences in the levels of inequality between countries. The difference are due, not so much to the distribution of primary income, labour and capital, which are quite unequal everywhere, but to the magnitude and progressivity of secondary income, benefits less tax, which still differ considerably between countries. (OECD, 2018).

Traditionally the studies on the distribution of income between countries and regions and those dealing with the distribution and redistribution of income among people, have pursued different objectives and employed different methods (Cowell, 2011). Now the barriers are vanishing with the proposal of new methods (Fortin et al, 2012), unification attempts (Shorrocks, 2013), or simultaneous decomposition of specific indexes (Mussard, 2004, Gianmatteo, 2007, Mussini, 2013 or Parmet and Schechtman, 2017).

Based on the above proposals, in this work we carry out a simultaneous decomposition by regions and sources of income, for different measures of inequality, applied to the case of Ecuador using microdata from the latest household survey available ENIGHUR 2011-2012. Among the results obtained, it is important to highlight how the distribution of secondary incomes has a lesser role than that of primary incomes when explaining differences in levels of inequality between regions. The confirmation of these results to the regions of other countries and its contrast with those observed in international comparisons would allow deriving some interesting implications on the lack of supranational institutions.

Key Words: Inequality decomposition, redistribution, regional inequality, Ecuador.

Eje Temático 2 : Economía Nacional, Regional y Local

Eje Temático 3 : Economía del Sector Público. Administración y Gobernanza

PYMES EN LA ECONOMÍA GLOBAL: ANÁLISIS DEL PROCESO DE INTERNACIONALIZACIÓN

MARÍA DEL PILAR CASADO BELMONTE

Universidad de Almería
mbelmont@ual.es

GEMA MARÍA MARÍN CARRILLO

Universidad de Almería
gmarint@ual.es

MARÍA DE LAS MERCEDES CAPOBIANCO URIARTE

Universidad de Almería
mercedescapobianco@ual.es

EDUARDO TERÁN YÉPEZ

Universidad de Almería
ety879@inlumine.ual.es

e-mail María del Pilar Casado Belmonte: mbelmont@ual.es

Resumen

La importancia de las pequeñas y medianas empresas (Pymes) en la economía de la mayoría de los países es ampliamente reconocida. Además, la globalización experimentada en los últimos años ha empujado a las Pymes a abrirse al comercio internacional, como primer paso en el proceso de internacionalización. La investigación en este proceso en las Pymes ha crecido exponencialmente en los últimos años, sin embargo, este tipo de empresas se diferencian de las más grandes en cuanto a la dinámica del proceso, obstáculos y enfoques de cooperación. Además, las teorías clásicas bajo las cuales se estudian los procesos de internacionalización, no se ajustan a las particularidades de las Pymes. Por este motivo, el objetivo del presente trabajo es profundizar en el estudio de los determinantes, procesos y beneficios de la internacionalización de las Pymes. Para ello, se realiza un análisis bibliométrico que permite establecer cuáles son los aspectos más investigados en esta área de investigación, incluyendo un estudio de palabras clave, autores principales e instituciones. Los resultados obtenidos indican que sectores básicos en la investigación han sido la innovación y la empresa familiar. A su vez, las futuras líneas de investigación apuntan al emprendimiento internacional como concepto que se vincula estrechamente con la internacionalización de las Pymes. La contribución de este trabajo es sentar las bases de la investigación pasada y mostrar las posibles líneas de investigación, lo cual puede ayudar a un mejor entendimiento del proceso de internacionalización de las Pymes y, a ofrecer una visión genérica a los investigadores noveles en el tema.

Abstract

The importance of small and medium enterprises (SMEs) in the economy of most countries is widely accepted. Moreover, globalization in the last decades has spurred SMEs on international commerce, as a first step in the internationalization process. Research on this topic has grown and evolved for the last years. However, the characteristics of SMEs make the process different from large companies and work studying. The aim of this paper is to provide a general understanding of the research on the field through bibliometric analysis. The main results show that innovation and family firms are the topic most studied. Furthermore, the concept of international entrepreneurship seems to be the current tendency.

Key Words: Internationalization, SMEs, bibliometric analysis

Eje Temático 7 : Economía y Empresa

PREVISÃO DE FALÊNCIA EMPRESARIAL: A EFICIÊNCIA DOS MODELOS NAS EMPRESAS IBÉRICAS DA VELHA ECONOMIA AZUL

CÂNDIDO J. PERES M.

ISCAL - Instituto Superior de Contabilidade e Administração de Lisboa
Av. Miguel Bombarda, 20 1069-035 Lisboa/cjperes@iscal.ipl.pt

MÁRIO A. GUERREIRO ANTÃO

Faculdade de Ciências da Economia e da Empresa/COMEGI/Universidade Lusíada de Lisboa
Rua da Junqueira, 188-198 1349-001 Lisboa/maga@lis.ulusiada.pt

e-mail Cândido J. Peres M.: cjperes@iscal.ipl.pt

Resumo

Apesar da recente crise financeira e do crescente número de encerramentos de empresas, com o distanciamento e passar do tempo vão-se dissipando as preocupações, aligeirando os critérios de análise e tornando menos apertadas as avaliações, algo que alguns autores chamam de *disaster myopia* e que Cornand e Gimet (2012) caracterizam como um pressuposto teórico onde os investidores desvalorizam a informação relevante relativamente ao crescimento do risco.

A avaliação da percepção desse risco por parte dos *stakeholders* torna crucial compreender as causas da falência ou quebra de sustentabilidade empresarial, bem com formas eficientes de a prever. Estas, principalmente suportadas em técnicas de análise financeira com o passar do tempo deram origem a uma diversidade de ferramentas com enfoque particular na Análise Discriminante Multivariada.

Continuando o trabalho desenvolvido por Peres e Antão (2019), no presente artigo identifica-se a melhor alternativa na previsão de falência ou quebra de sustentabilidade empresarial no Sector da Velha Economia Azul (Pesca, Aquacultura e demais indústrias afins) em Portugal e Espanha, até 5 anos antes desta ocorrer.

Seleccionamos, entre as empresas portuguesas e espanholas, as da Velha Economia Azul repartindo-as por duas amostras, emparelhadas por volume de negócios e dimensão; uma representativa das empresas falidas e outra das saudáveis, num total de 54 empresas. Foram aplicados 21 dos modelos multissetoriais, com maior presença na literatura, com origem numa diversidade de países e para vários horizontes temporais.

Como conclusões, além da identificação das principais causas da falência, identificam-se os modelos que se constituem nos melhores previsores de falência ou de sustentabilidade, para as indústrias da Velha Economia Azul ibéricas, até 5 anos antes desta ocorrer.

Palavras-chave: Análise Discriminante Multivariada, Falência Empresarial, Modelos de Previsão.

Abstract

In spite of the recent financial crisis and the increasing number of company foreclosures, the distancing and passage of time will dispel the concerns, lightening the analysis' criteria and making the risk's evaluation less tight, something that some authors call disaster myopia and that, according to Cornand and Gimet (2012), is a theoretical assumption where investors devalue relevant information regarding the risk's growth.

The risk's evaluation by the stakeholders makes it crucial to understand the causes of bankruptcy or breach in corporate sustainability, as well as more efficient ways of predicting it. These techniques, mainly supported by financial analysis, over time, have given rise to a diversity of approaches in particular to the Multivariate Discriminant Analysis.

Continuing the work developed by Peres and Antão (2019), we aim to validate the efficiency of existing models by choosing what constitutes the best alternative for forecasting bankruptcy or, in other words, a breach in corporate sustainability in the Old Blue Economy Sector (Fishing, Aquaculture and other related industries) in Portugal and Spain up to 5 years before this occurs.

We selected, among the Portuguese and Spanish companies, those from the Old Blue Economy Sector dividing them in two samples, matched by and size business' volume; one representative of the bankrupt companies and another of the healthy ones, in a total of 54 companies. To those samples were applied 21 of the multisectoral models with greater presence in the literature, from a diversity of countries and with several time horizons.

As conclusions in addition to the reflection on the causes of bankruptcy, were identified the models that are the best bankruptcy or sustainability breach's predictors, to the industries of the Old Iberian Economy up to 5 years in advance.

Key Words: Multivariate Discriminant Analysis, Business Bankruptcy, Forecast Models.

Eixo Temático 10: Economia Azul. Do Mar e Atividades Marítimas

AVALIAÇÃO DE PERFORMANCE E ESTRATÉGIA EMPRESARIAL: DESAFIOS E OPORTUNIDADES DE CRIAÇÃO DE VALOR

MÁRIO A. GUERREIRO ANTÃO

Faculdade de Ciências da Economia e da Empresa
COMEGI/Universidade Lusíada de Lisboa/jmov@outlook.pt

CÂNDIDO J. PERES M.

ISCAL - Instituto Superior de Contabilidade e Administração de Lisboa
cjperes@iscal.ipl.pt

MÁRIO A. GUERREIRO ANTÃO JOSÉ MIGUEL ORNELAS VASCONCELOS

Faculdade de Ciências da Economia e da Empresa/COMEGI
Universidade Lusíada de Lisboa/maga@lis.ulusiada.pt.

e-mail José Miguel Ornelas Vasconcelos: jmov@outlook.pt

Resumo

Estudando o processo de avaliação de performance empresarial, pretendemos em concreto analisar o contributo do processo de formulação da estratégia como alternativa à utilização da análise financeira tradicional.

Pese embora, os contributos mais recentes recomendem a utilização de técnicas de análise integrada de todos os *drivers* da formulação e implementação da estratégia, como o *balanced scorecard*, a opção pela análise única das rendibilidades e resultados contabilísticos (com predomínio da perspectiva de curto prazo), é algo que, não só é apontado como uma das principais causas da última crise, como ainda continua a marcar presentemente a agenda das empresas, quando nos referimos à análise de performance.

Podemos assim dividir o presente artigo em quatro partes essenciais: um primeiro capítulo, onde são abordados os fundamentos do processo de decisão da estratégia, conjugados com a definição do objectivo da empresa. Seguidamente avançamos para a revisão dos principais desenvolvimentos no domínio da avaliação da performance empresarial, elencando as principais teorias presentes na produção científica nesta área. Analisaremos com maior acuidade os principais modelos de avaliação de performance (Tradicional e Económico), terminando com a sugestão de potenciais sinergias com outras metodologias de análise integrada da estratégia da empresa.

O potencial evidenciado pelos modelos integrados de análise indiciam a sua aplicação futura como a mais adequada à análise de performance.

Palavras-chave: Performance, Criação de Valor, Estratégia Empresarial.

Abstract

Studying the process of evaluating corporate performance, in articulation with the definition of the company strategy, we intend in concrete to analyze the process of formulating the strategy beyond the main developments, in terms of the evaluation of its implementation.

Nevertheless, the most recent contributions recommend the use of integrated analysis techniques for all the drivers of strategy implementation, such as the Balanced Scorecard, the option of a single analysis of the returns and accounting results (with greater focus on the financial position and in short-term performance) not only has been pointed out as one of the main causes of the last financial crisis, but still continues to mark the agenda of the companies, in terms of performance analysis.

We can thus divide this article into four essential parts: a first chapter, which discusses the strategic decision fundamentals, together with the definition of the company objective. Then we proceed to review the main developments in the field of business performance evaluation, listing the main theories present in the scientific production in this area. We will analyze more accurately the main models of performance evaluation (Traditional and Economic), ending with the suggestion of potential synergies with other methodologies of integrated analysis of companies strategy.

The potential evidenced by the integrated models of analysis indicate their future application as the most adequate to performance analysis.

Eixo Temático 7 : Economia e Empresa

FACTORES DETERMINANTES DE INEFICIENCIA DE LAS MYPES EN EL SECTOR DE RESTAURANTES Y ALOJAMIENTO EN EL PERÚ: UN ANÁLISIS DE FRONTERA ESTOCÁSTICA

VÍCTOR A. CHANG ROJAS

Facultad de Ciencias Económicas y Empresariales/Universidad Ricardo Palma
Av. Benavides 5440 - Santiago de Surco Lima 33 Perú/victor.chang@urp.edu.pe

CINDY M. JUAREZ RAMIREZ

Facultad de Ciencias Económicas y Empresariales/Universidad Ricardo Palma
Av. Benavides 5440 - Santiago de Surco Lima 33 Perú/cindy.juarez@urp.edu.pe

e-mail autor de contacto: victor.chang@urp.edu.pe

Resumen

La Micro y Pequeña Empresa (MYPE) ha jugado un rol importante en el crecimiento económico que ha tenido el Perú en los últimos años, que bordea el 5.0%, ya que son una gran fuente generadora de empleo y de desarrollo regional. Sin embargo, las MYPES en su mayoría presentan un sistema productivo precario e ineficiente, con problemas de acceso al crédito y alta informalidad (83.5 %). A pesar de las políticas implementadas por el Estado como políticas para acceder a beneficios tributarios, capacitaciones, acceso al crédito y seguridad social para los trabajadores, entre otros, estas no han tenido el impacto deseado. En ese contexto, el objetivo del artículo es analizar la ineficiencia e identificar los principales factores que la determinan, para la MYPES de alojamiento y restaurantes en Perú, las cuales representan más del 50% del total de MYPES y sirven de gran soporte a la actividad turística en el país. Para tal fin una función Cobb Douglas y una translogarítmica es estimada para los sectores de alojamiento y restaurantes, respectivamente mediante la metodología de Análisis de Fronteras Estocásticas. La base de datos corresponde a una encuesta de MYPE en Perú del 2012. Los resultados muestran que mayor antigüedad de la empresa, el hecho que pertenezcan a un grupo empresarial, mayor asistencia a capacitaciones, cursos TIC (tecnología, información y conocimiento) y eventos sobre tecnología contribuyen a reducir la ineficiencia en ambos sectores. El documento está organizado como sigue, posterior a la introducción, se describe el sector MYPE de alojamiento y restaurantes, luego se realiza una revisión de la literatura, para proceder a explicar la metodología y los datos empleados. Finalmente, se presentan los resultados y conclusiones.

Palabras clave: MYPES, Sector restaurantes y alojamiento, Análisis de Fronteras Estocásticas, ineficiencia técnica.

Eje Temático 4 : Economía Sectorial y de Servicios

Abstract

The Micro and Small Enterprise (MSE) has played an important role in the Peruvian economic growth in recent years, which is around 5.0%. These are a great source of employment and regional development. However, most MSEs have a precarious and inefficient productive system, with problems of access to finance and high informality (83.5%). Despite the Government policies implemented as access tax benefits, training, access to credit and social security for workers, among others, these have not had the desired impact. In this context, the objective of this article is to analyze the inefficiency and to identify the main factors that determine it, for the accommodation and restaurant MSEs in Peru, which represent more than 50% and serve as a great support for the activity tourist in Peru. To do that, a Cobb Douglas function and a translogarithmic function are estimated for the accommodation and restaurant sectors, respectively, using the Stochastic Frontiers Analysis methodology. The database corresponds to a survey of MYPE in Peru in 2012. The results show that the company's seniority, the fact that they belong to a business group, more assistance to training, ICT courses (technology, information and knowledge) and events on technology contribute to reduce inefficiency in both sectors. The document is organized as follows, after the introduction, the MSE sector of accommodation and restaurants is described, and then a literature review is made, to proceed to explain the methodology and the data used. Finally, the results and conclusions are presented.

Key Words: Micro and Small Enterprise (MSE), accommodation and restaurant sectors, Stochastic Frontiers Analysis, technical inefficiency.

Eje Temático 4 : Economía Sectorial y de Servicios

ANÁLISIS DE LA SEVERIDAD DE LA VIOLENCIA CONTRA LA MUJER: UN MODELO LOGIT ORDINAL GENERALIZADO

TATIANA PAREDES SEGURA

Facultad de Ciencias Económicas y Empresariales/Universidad Ricardo Palma
Av. Benavides 5440 - Santiago de Surco Lima 33 Perú/tatianaparedessegura@gmail.edu.pe

WILLIAMS MENDOZA FERNANDEZ

Universidad Nacional del Callao
mendoza.fernandez.w@gmail.com

e-mail Tatiana Paredes Segura: tatianaparedessegura@gmail.edu.pe

Resumen

Durante los últimos años la violencia contra la mujer en el Perú ha ido disminuyendo, sin embargo el porcentaje aún es alto. Así, en el 2016 el 68.2% de las mujeres experimentó alguna vez situación de violencia psicológica y/o verbal, física o sexual por parte del esposo o compañero (INEI, 2016). Asimismo, en ese mismo año se presentaron 124 casos de feminicidio y 258 casos de tentativa de feminicidio (MIMP, 2016). En este marco, el presente artículo tiene como objetivo principal identificar los factores que determinan la severidad de la violencia contra la mujer en el Perú. Para tal fin, se emplea principalmente información obtenida del Registro Nacional de Denuncias de Delitos y Faltas, y un modelo Logit ordenado generalizado para obtener los resultados. Los principales resultados muestran que el estado civil es un determinante de la severidad de la violencia contra la mujer, siendo las mujeres solteras menos propensas a experimentar violencia; por otro lado, la evidencia empírica muestra que las mujeres jóvenes, con menor nivel educativo, menor ingreso y/o que no se encuentren trabajando son las más propensas a experimentar violencia. La estructura del artículo es la siguiente, posterior a la introducción la segunda sección muestra la revisión de la literatura y metodología respecto a la violencia contra la mujer, seguido del planteamiento del objetivo y el análisis de la información respecto a la violencia contra la mujer a través de la estadística descriptiva. Finalmente, se presenta los principales resultados así como las conclusiones de la investigación.

Palabras clave: Violencia contra la mujer, Logit ordenado generalizado, severidad, feminicidio.

Eje Temático 6 : Economía Social, Cooperación y Desarrollo

Abstract

In recent years, violence against women in Peru has been decreasing, however the percentage is still high. Thus, in 2016, 68.2% of women experienced a situation of psychological and / or verbal, physical or sexual violence on the part of their husband or partner (INEI, 2016). Likewise, in that same year, 124 cases of femicide and 258 cases of attempted femicide were presented (MIMP, 2016). In this framework, the main objective of this article is to identify the factors that determine the severity of violence against women in Peru. For this purpose, mainly information obtained from the National Registry of Complaints of Crimes and Misdemeanors is used, and a Logit model ordered generalized to obtain the results. The main results show that marital status is a determinant of the severity of violence against women, with single women less likely to experience violence; On the other hand, the empirical evidence shows that young women with lower educational level, lower income and / or who are not working are the most likely to experience violence. The document is organized as follows, after the introduction the second section shows the literature review and methodology regarding violence against women, then the objective and the analysis of the information regarding violence against women is showed through descriptive statistics. Finally, the main results are presented as well as the conclusions of the investigation.

Key Words: Violence against women, ordered generalized logit, severity, femicide.

LA IDE: ¿ALGÚN IMPACTO SOBRE LA SALUD SOCIOECONÓMICA DE LOS PAÍSES RECEPTORES? ESTUDIO DE CASO

MOUNA RAJI

Programa de doctorado en Economía y Empresa/Universidad de Málaga
Calle El Ejido nº 6. 29071 Málaga, España/raji.mouna@gmail.com

ALBERTO A. LÓPEZ TORO

Departamento de Economía y Administración de Empresas/Universidad de Málaga
Calle El Ejido nº 6. 29071 Málaga, España/aalopez@uma.es

e-mail Mouna Raji: raji.mouna@gmail.com

Resumen

Los diseñadores de política pública invierten grandes esfuerzos en la creación de un entorno favorable a la atracción de la Inversión Directa Extranjera (IDE) vista su eficacia como instrumento de desarrollo y de bienestar socioeconómico en los países receptores.

En este sentido, el presente trabajo procura analizar cómo la IDE puede representar una estrategia de desarrollo y bienestar en algunos países receptores en desarrollo determinando las ventajas que ésta transmite, los canales de transmisión de estas ventajas y las características a poseer por estos países con el fin de maximizar la absorción de las externalidades positivas de la IDE. Además, se propondrá un modelo econométrico para la evaluación del impacto de la IDE (y otras variables influyentes) en uno de los aspectos del bienestar influidos por la recepción de la IDE.

Así, se ha llegado a la conclusión de que la transferencia de tecnología y de conocimientos, el desarrollo del capital humano, la creación de empleo y la reducción de la desigualdad y de la pobreza son algunos de esos efectos positivos de la IDE que animan a los decidores de política pública a diseñar más políticas de promoción de la IDE en las economías receptoras. Efectivamente, la IDE desempeña un papel importante en la transferencia de tecnología gracias a las relaciones comerciales entre empresas locales y extranjeras. Estas últimas suministran inputs de buena calidad y tecnología avanzada a las empresas locales. Además, las empresas extranjeras invierten más en formación y suelen estar más al corriente de sus últimas tendencias (tendencias de formación) comparando con las locales contribuyendo, así, al desarrollo del capital humano. A nivel social, la IDE reduciría el desempleo, la desigualdad y la pobreza gracias a la movilidad económica y social generada por esa creación de empleos estables y con salarios más altos.

Palabras clave: Inversión Directa Extranjera, Desarrollo, Bienestar, Países receptores en desarrollo, Externalidades.

Abstract

Public policy makers invest considerable efforts creating a favorable context for Foreign Direct Investment (FDI) attraction given its efficiency as an instrument for socioeconomic development and welfare in the receiving countries.

To this effect, the present work aims to analyse how FDI could be a development strategy in some developing host countries by determining the externalities that it generates, the transfer channels of these externalities and the features to be developed in host countries in order to maximize the absorptive capacity of FDI's positive externalities. Moreover, we propose an econometric approach to evaluate the impact of FDI (and other influent variables) on one of the development aspects affected when receiving FDI.

Thus, it has been concluded that transfers of technology and knowledge, human capital development, employment creation and inequality and poverty reduction are some of these positive effects of FDI that encourage decision makers to design more FDI attraction policies in the receiving economies. Indeed, FDI plays an important role in technology transfers thanks to the commercial relationships existing between local and foreign firms. These ones supply quality inputs and advanced technology to the local ones. Moreover, foreign firms invest more than the local ones in training and are, generally, up-to-date with its tendencies (training tendencies), what improves human capital in the host country. On the social level, FDI would contribute to the unemployment, inequality and poverty reduction in host countries thanks to the economic and social mobility that it generates when creating stable jobs, with higher salaries.

Key Words: Foreign Direct Investment, Development, Welfare, Developing receiving countries, Externalities.

Thematic Area 1 : International Economy

DISPOSICIÓN A INNOVAR Y COMPETITIVIDAD: UN ANÁLISIS PARA LAS EMPRESAS EXTREMEÑAS

BEATRIZ CORCHUELO MARTÍNEZ-AZÚA

Facultad de CC.EE. y EE./Dpt. Economía/Universidad de Extremadura
Avda. de Elvas, s/n. 06006 Badajoz/bcorchue@unex.es

FELIPE MARTÍN-VEGAS

Centro Universitario de Plasencia/Departamento de Organización de Empresas y
Sociología/Universidad de Extremadura
Avda. Virgen del Puerto. 10600 Plasencia (Cáceres)/felipemarve@unex.es

e-mail Beatriz Corchuelo Martínez-Azúa: bcorchue@unex.es

Resumen

Es comúnmente reconocido que la innovación es esencial para el crecimiento y el bienestar de las economías. Las empresas, como agentes de los sistemas de innovación, desempeñan un papel fundamental en la actividad innovadora de las economías. Sin embargo, la existencia de barreras a la innovación se manifiesta en una baja disposición a innovar de las empresas a pesar de ser un elemento importante de competitividad.

El objetivo de este estudio es analizar las características de las empresas extremeñas en base a las percepciones que tienen sobre estas dos variables: *disposición a innovar* y *evaluar la innovación como un elemento esencial de la competitividad*. Estas dos percepciones son fundamentales a la hora de decidir innovar. También influye la intervención del gobierno para incentivar la innovación y el tipo de acciones que las empresas demandarían para desarrollar innovación o continuar realizando actividades innovadoras.

Para ello, se elaboró un cuestionario *ad hoc* centrado principalmente en variables relacionadas con la innovación y otros aspectos adicionales. Se obtuvo una muestra representativa de empresas de la Comunidad Autónoma de Extremadura.

En primer lugar, las empresas se clasifican según estas dos variables de percepción: *disposición a innovar* y *competitividad*, permitiendo distinguir 4 perfiles diferenciados. Después, las empresas en cada perfil se caracterizan en base a diversas variables como tamaño; sector de actividad; innovación y tipos de innovación; exportaciones; obstáculos a la innovación percibidos; y tipos de acciones públicas demandadas para incentivar la innovación.

Los resultados se comparan y discuten para dos oleadas de datos (2011 y 2013). Los perfiles obtenidos se relacionan especialmente con diferentes obstáculos a la innovación percibidos y diferentes políticas públicas demandadas. Como implicación práctica se considera que esta caracterización puede ser útil en el diseño de políticas públicas regionales para estimular la innovación.

Palabras clave: Innovación, empresas, barreras a la innovación, competitividad, disposición a innovar, políticas públicas de I + D, Extremadura.

Eje Temático 2 : Economía Nacional, Regional y Local

Abstract

It is commonly recognized that innovation is essential for the growth and well-being of economies. Companies, as agents of innovation systems, play a fundamental role in the innovative activity of economies. Nevertheless, the existence of barriers to innovation are translated into a low willingness to innovate by companies despite being an important element of competitiveness.

The objective of this study is to analyze the characteristics of companies in the Extremadura region (Spain) based on the perceptions they have about these two variables: *willingness to innovate* and *assessing innovation as an essential element of competitiveness*. These two perceptions are fundamental when deciding to innovate. It also influences the perception of government intervention to encourage innovation and the type of actions that would be demanded by companies to be encouraged to innovate or continue carrying out innovative activities.

In order to reach this objective, we elaborate an *ad hoc* questionnaire focused mainly on variables related to innovation and other additional aspects. We contacted a representative sample of companies of the Autonomous Community of Extremadura.

First, companies are classified based on two perception variables: *willingness to innovate* and *competitiveness*, allowing to distinguish 4 differentiated profiles. Then, companies are characterized based on a series of variables as size; activity sector; innovation and types of innovation; export activity; obstacles to innovation perceived; and what types of public actions in order to boost innovation are demanded by the firms.

The results are compared and discussed for two data waves (2011 and 2013). The profiles obtained relate especially to different obstacles to innovation perceived and different public actions demanded. As a practical implication, it is considered that this characterization can be useful in the design of regional public policies to stimulate innovation.

Key Words: Innovation, companies, barriers to innovation, competitiveness, willingness to innovate, R&D public policies, Extremadura region.

Thematic Area 2 : National, regional and local economy

ANÁLISIS DE LA TENDENCIA A LA LIQUIDEZ DEL AGREGADO MONETARIO M3 EN LA EUROZONA: 1997-2018

CARLOS PATEIRO RODRÍGUEZ

Facultad de Economía. Departamento de Economía/Universidad de A Coruña
Campus de Elviña, s/n.15071 A Coruña/carlos.pateiro@udc.es

MARÍA JESÚS FREIRE SEOANE

Facultad de Economía. Departamento de Economía/Universidad de A Coruña
Campus de Elviña, s/n.15071 A Coruña/maje@udc.es

BEATRIZ LÓPEZ BERMÚDEZ

Facultad de Economía. Departamento de Economía/Universidad de A Coruña
Campus de Elviña, s/n.15071 A Coruña/beatriz.lopez2@udc.es

CARLOS PATEIRO LÓPEZ

BV Asesores Tributarios
C/Venezuela, 9-5ª Dcha. 15011 A Coruña/cpateiroud@gmail.com

e-mail Carlos Pateiro Rodríguez: carlos.pateiro@udc.es

Resumen

Las dos últimas décadas, el agregado monetario M3, de referencia del BCE, ha experimentado una fuerte tendencia hacia su acumulación en los componentes más líquidos: efectivo en circulación y depósitos a la vista, en detrimento de las modalidades de depósitos a plazo y otros componentes de menor ponderación. Si bien este comportamiento es compatible con una larga etapa de bajos tipos de interés, resulta interesante la búsqueda de otras explicaciones, complementarias y/o alternativas, a la fuerte concentración de la demanda de dinero en los activos más líquidos.

Esta deriva del agregado de referencia puede tener consecuencias sobre la estabilidad de precios, objetivo último del BCE, al tiempo que puede constituirse en elemento potencial de la modificación del comportamiento del ahorro.

En este trabajo, junto al análisis de la evolución de los siete componentes de M3 1997-2018, presentamos los resultados de un trabajo empírico sobre la estabilidad de la relación entre la demanda de dinero y las variables macroeconómicas determinantes, y un estudio de posibles rupturas estructurales en dichas relaciones.

Los resultados muestran que las fuertes perturbaciones e incertidumbres financieras a raíz de la crisis, así como las decisiones adoptadas por el BCE, poseen alguna capacidad explicativa del fenómeno estudiado.

Palabras clave: política monetaria, agregado monetario, raíces unitarias, liquidez, estabilidad.

Abstract

The last two decades, the monetary aggregate M3, reference aggregate of the ECB, has experienced a strong tendency towards its accumulation in the most liquid components: currency in circulation and overnight deposits, to the detriment of the modalities of deposits with an agreement maturity and other less weighting components. Although this behavior is compatible with a long period of low interest rates, it is interesting to look for other explanations, complementary and/or alternative, to the strong concentration of money demand in the most liquid components.

This drift of the reference aggregate can have consequences on price stability, the ultimate objective of the ECB, while it can be a potential element in the modification of saving behavior.

In this paper, together with the analysis of the evolution of the seven components of M3 1997-2018, we present the results of an empirical work on the stability of the relationship between the demand for money and the macroeconomic variables that determine it, and a study of possible structural ruptures in these relationships.

The results show that the strong financial disturbances and uncertainties as a result of the crisis, as well as the decisions adopted by the ECB, have some explanatory capacity of the studied phenomenon.

Key Words: Monetary policy, monetary aggregate, liquidity, unit root, stability.

LAS TIC EN LA AGRICULTURA: ¿REDUCIENDO O INCREMENTANDO DESIGUALDADES?

MARÍA ÁNGELES RUBIO PASTOR

Centro Universitario de la Defensa/ Área de Economía y Gestión/Universidad de Zaragoza
Ctra. Huesca, s/n 50019 - Zaragoza

JORGE ALBARRACÍN DEKER

Postgrado en Ciencias del Desarrollo (CIDES)/ Área Desarrollo territorial y ambiente
Universidad Mayor de San Andrés (UMSA)/Obras Calle 3 N 515. La Paz - Bolivia

e-mail María Ángeles Rubio Pastor: marubio@unizar.es

Resumen

El avance observado en las distintas Tecnologías de la Información y la Comunicación (TIC) dirigidas a la actividad agrícola ha posibilitado mejores resultados de las explotaciones. La generación, transmisión e interpretación de mayor cantidad de información ha permitido tomar mejores decisiones, que han redundado en mayor productividad de los recursos y, en consecuencia, en rendimientos más elevados. Sin embargo, no puede decirse que estos beneficios estén llegando a todos los productores por igual. Pese a que las TIC se están introduciendo en la actividad agraria a nivel mundial, son todavía muy acusadas las diferencias que se dan entre países. La desigual dotación en infraestructuras de conectividad, las distintas políticas nacionales, la disparidad en la investigación y desarrollo más cercanos, son, entre otros, factores que dificultan un acceso igualitario a estas tecnologías entre países desarrollados y en desarrollo. A su vez, dentro de un mismo país, las diferencias existentes entre pequeños y grandes productores también pueden agudizar este acceso desigual e incrementar la brecha en productividad ya existente.

El objetivo de la comunicación es analizar el acceso y uso de las TIC por parte de los productores agrícolas en Bolivia, un país en desarrollo, con una clara diferencia entre grandes productores, con vocación exportadora, y pequeños campesinos, con una producción más orientada al autoconsumo. Para ello se van a utilizar los datos aportados por una encuesta a 176 productores sobre la predisposición y la accesibilidad que permiten o no el uso de estas tecnologías.

Pese a que, efectivamente, en la actualidad se está observando menor tenencia móviles inteligentes y uso de aplicaciones por parte de los productores más pequeños, también es cierto que las condiciones y su predisposición son positivas, lo que revela una buena aceptación de este tipo de tecnologías y la posibilidad de que su uso se vaya incrementando con el tiempo.

Palabras clave: tecnologías TIC, medio rural, actividad agrícola, países en desarrollo.

Abstract

The progress observed in the different Information and Communication Technologies (ICT) for agricultural activity has improved the income statement of the farms. The generation, transmission and interpretation of more information has allowed for better decisions. This has increased the productivity of resources and, consequently, has got higher profits. However, it can not be said that these benefits are reaching all producers equally. Despite the fact that ICTs are being introduced into agricultural activity worldwide, there are differences between countries. Unequal endowment in connectivity infrastructures, different national policies, disparity in the closest research and development, are, among others, factors that hinder equal access to these technologies between developed and developing countries. In turn, within a country, differences between small and large producers can also exacerbate this unequal access and increase the existing productivity gap.

The objective of the communication is to analyze the access and use of ICT by agricultural producers in Bolivia, a developing country, with a clear difference between large producers, with export orientation, and small farmers, with a production for self-consumption. To this goal, data provided by a survey of 176 producers, about predisposition and accessibility, allows to see if these technologies are used or not.

In spite of there is less intelligent mobile ownership and use of applications by smaller producers, it is also true that the conditions and their predisposition are positive, which reveals a good acceptance of this type of technologies and the possibility that their use will increase over time.

Key Words: ICT technologies, rural environment, agricultural activity, developing countries.

Eje Temático 5 : Economía Ambiental y de Recursos Naturales no marinos

Eje Temático 8 : Economía de la Información y del Conocimiento

LA GOBERNANZA AZUL: UNA GOBERNANZA PORTUARIA SOSTENIBLE

BEATRIZ LÓPEZ BERMÚDEZ

Facultad de Economía y Empresa/Departamento de Economía Aplicada/Universidade da Coruña
Campus de Elviña, s/n, 15071, A Coruña/beatriz.lopez2@udc.es

MARÍA JESÚS FREIRE SEOANE

Facultad de Economía y Empresa/Departamento de Economía Aplicada/Universidade da Coruña
Campus de Elviña, s/n, 15071, A Coruña/maje@udc.es

CARLOS PATEIRO RODRÍGUEZ

Facultad de Economía y Empresa/Departamento de Economía Aplicada/Universidade da Coruña
Campus de Elviña, s/n, 15071, A Coruña/carlos.pateiro@udc.es

MAURO RODRÍGUEZ GARCÍA

Facultad de Economía/Universidad Nacional Autónoma de México. México
kykloz@yahoo.com.mx

e-mail Beatriz López: beatriz.lopez2@udc.es

Resumen

El puerto como infraestructura de servicios marítimos ha evolucionado en sus funciones a lo largo de los años hasta configurarse como un nodo logístico complejo dentro de la cadena multimodal del transporte de mercancías. Las clasificaciones que se han formulado en el plano teórico únicamente han tenido en cuenta el esquema de gobernanza desde el punto de vista mercante, es decir, desde la perspectiva del transporte de mercancías.

Sin embargo, es necesario tener en cuenta la interconexión de la industria y las actividades de los trabajadores del mar. Es decir, la economía diversificada más allá del transporte de mercancías que representa la energía eólica, la investigación marina, la pesca, la acuicultura, el turismo, etc.

En esta investigación se presenta una propuesta de estudio sobre la gobernanza desde el enfoque de la Política Marítima Integrada de la Unión Europea, que trata de aportar coherencia a los problemas en el sector marítimo a través de la coordinación de todos los *stakeholders* de estos sectores, para hacer frente a una estrategia por cuencas marítimas.

El objetivo de esta investigación es identificar las barreras y los problemas actuales que surgen cuando se trata de implementar la Política Marítima Integrada en la organización de los espacios marinos. El reto es alcanzar la *gobernanza azul*, es decir, la activación de una red de cooperación entre los diferentes *stakeholders* de los sectores portuarios para ser capaz de integrar los diferentes niveles regionales, nacionales, europeos e internacionales, hacia la colaboración más estructura y sistemática.

Palabras clave: Gobernanza Azul, Economía Azul, Unión Europea, PMI, *Stakeholders*.

Abstract

The port as maritime services infrastructure has evolved in its functions over the years to become a complex logistic node within the multimodal chain of freight transport. The classifications that have been formulated in the theoretical framework have only taken into account the governance scheme from the merchant point of view, that is, from the perspective of freight transport.

However, it is necessary to take into account the interconnection of industry and the activities of sea/maritime workers. That is, the diversified economy beyond the transport of merchandise that represents wind energy, marine research, fishing, aquaculture, tourism, etc.

This research presents a proposal for a study of governance from the perspective presented in the Integrated Maritime Policy of the European Union, which seeks to provide coherence to the problems in the maritime sector through the coordination of all stakeholders in the maritime sector.

The objective of this research is to identify the barriers and problems that occur when a Member State tried to implement the Integrated Maritime Policy in the governmental organization of marine spaces. The challenge is to achieve the *blue governance*, that is, the activation of a network of cooperation between the different stakeholders of the port sectors to be able to integrate the different regional, national, European and international levels, towards collaboration structure and systematic.

Key Words: Blue growth, Blue Economy, European Union, IMP, Stakeholders.

Eje Temático 10 : Economía Azul. Del Mar y Actividades Marítimas

CLAVES DE LA RENTABILIDAD EN EL SECTOR PORCINO ESPAÑOL

ALBA CARDIL FORRADELLAS

Universidad de Lleida/a.cardil.f@gmail.com

Resumen

El sector porcino español ha tenido un relevante proceso de transformación, así como un elevado crecimiento en las últimas décadas, situándose a nivel estatal como la rama más importante dentro del sector ganadero. Con grandes cifras de exportación y contribuyendo a la generación de empleo estable en muchas zonas rurales, la explotación de sus recursos se desarrolla, actualmente y en la mayoría de los casos, mediante el sistema de ganadería integrada. Muchos ganaderos de las explotaciones porcinas firman contratos de integración con empresas integradoras mediante un acuerdo que une a ambas partes en la producción de los animales a través de un reparto de funciones. A raíz de lo anterior, el objetivo principal del presente trabajo consiste en determinar los factores que impulsan la rentabilidad de las empresas de dicho sector en España en base a tres niveles: empresa, subsector y territorio. El estudio se realiza mediante el uso de variables que describen las características económico-financieras de las compañías, así como su posición geográfica y su entorno empresarial, sectorial y territorial. Los resultados obtenidos proporcionan información relevante tanto para la futura puesta en marcha de nuevas entidades así como para la mejora de las empresas existentes ante la actual competencia del sector, que les permitirá estar mejor situadas de cara a la superación de crisis futuras.

Palabras clave: Sector porcino, Sector agroalimentario, Rentabilidad económica, Contrato de integración porcina, Efecto empresa, Efecto subsector, Efecto territorio.

Abstract

The Spanish swine sector has had an important process of transformation, as well as a high growth in the last decades. It is the most important branch within the livestock sector, has large export figures and contributes to the generation of stable employment in many rural areas. Currently it is developed in most cases through the contract hog production. Many of the farmers sign integration contracts with companies, through an agreement between both in the production of the animals. Against this background, the main objective of this paper is to find out the factors that drive the profitability of companies in the Spanish swine sector based on three levels: firm, industry and location. The study is carried out using information about the economic-financial characteristics of companies and their environment and location. Our results can be useful for the the creation of new entities and the improvement of the existing companies in the current competition situation of the sector. It is expected that the proposed factors are decisive in the profitability of firms, which will allow them to overcome future crises.

Key Words: Swine sector, Food industry, Profitability, Contract hog production, Firm effect, Industry effect, Location effect.

PERCEPTIONS ON THE “LIMITS TO PRIVATIZATION” IN FISHERIES

MARIA ROSA QUARTIN BORGES

UECE; ISEG/Universidade de Lisboa
Rua Miguel Lupi, 20 1249-078 Lisboa/mrborges@iseg.ulisboa.pt

LUIS DOMINGOS PEREIRA CÁ

ISEG/Universidade Lisboa
Rua Miguel Lupi, 20 1249-078 Lisboa/lpereira.ca@gmail.com

MANUEL FRANCISCO PACHECO COELHO

SOCIUS; ISEG/Universidade de Lisboa
Rua Miguel Lupi, 20 1249-078 Lisboa/coelho@iseg.ulisboa.pt

MARIA ISABEL DE DEUS MENDES

SOCIUS; ISEG/Universidade de Lisboa
Rua Miguel Lupi, 20 1249-078 Lisboa/midm@iseg.ulisboa.pt

e-mail Manuel Francisco Pacheco Coelho: coelho@iseg.ulisboa.pt

Resumen

La sobrecapacidad y la sobre-capitalización se identificaron en varios estudios como el principal fracaso de la Política Pesquera Común (PPC). Esta conclusión puede ser importante para la reforma en curso de la PPC y para el debate sobre las herramientas para lograr una gestión sostenible.

Los esquemas de gestión basada en derechos ya se han experimentado en pesquerías y localizaciones específicas. Las indicaciones prácticas y las lecciones que brindan estas experiencias son fundamentales para explorar la viabilidad de tales instrumentos y sus impactos sociales, económicos y ambientales.

El propósito de esta comunicación es continuar este debate: se presta especial atención a la posibilidad de introducir un enfoque más centrado en la gestión basada en derechos, en forma de cuotas individuales transferibles (individuales) en la PPC.

El documento introduce el marco teórico básico de las cuotas individuales transferibles y hace una revisión crítica de su introducción en las pesquerías europeas. Aborda el caso portugués e informa sobre las diferentes percepciones de los *stakeholders* portugueses. El análisis de contenido de las entrevistas semiestructuradas realizadas con varios agentes, destaca los impactos sociales significativos previstos.

Un tema importante que se plantea es la falta de diferenciación en la aplicación de estos esquemas de regulación a diferentes segmentos de la pesca europea. En el caso de Portugal, varias organizaciones ecologistas destacan el problema específico de la pesca artesanal. Estas pesquerías costeras no tienen efectos importantes sobre la pesca insostenible y la introducción de tal esquema de cuotas puede fácilmente poner al segmento en una situación de monopolización. Se espera un problema real de gran desempleo, aumentado por la "disolución" de importantes organizaciones de productores que están activas.

Palabras clave: Política Pesquera Común, Cuotas Individuales Transferibles, *Stakeholders*, Percepciones.

Abstract

Overcapacity and overcapitalisation was identified in several studies as the principal failure of the Common Fisheries Policy (CFP). This conclusion may be important for the on-going CFP reform and for the discussion about the tools to get sustainable management.

Rights Based Management schemes have already been experimented in specific fisheries and localizations. The practical indications and lessons given by these experiences are fundamental to explore the feasibility of such tools and their social, economic and environmental impacts.

The purpose of this paper is to continue this debate: A special attention is given to the possibility of introducing a more focused approach on Rights Based Management, in the form of ITQs (Individual Transferable Quotas) in the CFP.

The paper introduces the basic theoretical framework of Individual Transferable Quotas and makes a critical review of ITQs introduction in European fisheries. The paper approaches the Portuguese case and reports the different perceptions of the Portuguese stakeholders facing this situation. Content analysis of semi structured interviews made with several agents, highlights significant social predicted impacts.

An important issue that is posed is the lack of differentiation in the application of these regulation schemes to different segments of European fisheries. In the case of Portugal, several ecologist organizations put the specific problem of

artisanal fisheries. These coastal fisheries have no important effects on unsustainable fishing and the introduction of such a scheme of ITQs could easily put the segment in a situation of monopolization. A real problem of large unemployment is expected, augmented by the “dissolution” of important POs (Producers Organizations) that are active actually. Fishermen and vessel owners’ organizations sustain these preoccupations.

Key Words: Common Fisheries Policy, Individual Transferable Quotas, Stakeholders, Perceptions.

Eje Temático 10 : Economía Azul. Del Mar y Actividades Marítimas

THE ECONOMICS OF HAPPINESS: AN APPROACH TO PORTUGUESE ECONOMY

SANDRA RIBEIRO

OBSERVARE- Observatory of Foreign Relations/Universidade Autónoma de Lisboa
Rua de Santa Marta, 47. 1150-293 Lisboa

ANTÓNIO DUARTE SANTOS

CARS – Center for Economic Analysis of Social Regulation/Universidade Autónoma de Lisboa
Rua de Santa Marta, 47. 1150-293 Lisboa

e-mail autor contacto: sribeiro@autonoma.pt

Abstract

One of the major motivational sources humans have is feeling happy. The issue of Happiness has been studied since Ancient Greece. Recently, though, this has become a research topic in social fields such as Economics. In the past three decades, studies have been made on Happiness in the scope of Economics. However, not many have been developed on the Economics of Happiness, since it is a recent research field. Thus, our study aims to present a literature review that includes reference to the main factors for the increase of happiness, as well as the relation between economics and happiness. Ours is a validity analysis methodology in which Gross Domestic Product (GDP) is considered an indicator of excellence to represent the population's satisfaction level, evidencing the restraints and limitations to national income. We will describe the elements in the Well-Being Index in Portugal for 2004 to 2017 and link them to the country's position in the *World Happiness Index* and in the world GDP. Considering that national wealth is one of the elements in the analysis of Happiness, there is a positive relation between the two variables in the referred time span. However, our analysis has led us to discover other variables more relevant for the analysis of the happiness level and whose results are debatable.

Keywords: Economics of Happiness, Gross Domestic Product, World Happiness Index, Portugal Well-being Index.

Eje Temático 2 : Economía Nacional, Regional y Local

EL IMPACTO DEL NEUROLIDERAZGO EN LOS RESULTADOS ORGANIZACIONALES

GUILHERME VIRIATO DA SILVA PIAZZETTA

Universidad ISAE Brasil
gp@guilhermepiazzetta.com.br

e-mail Guilherme Viriato Da Silva Piazzetta: gp@guilhermepiazzetta.com.br

Resumen

La neurociencia, en los últimos años, ha proporcionado descubrimientos aplicables a diversas áreas profesionales y especialmente en el liderazgo. Más que una moda, es una ciencia actual que vino para quedarse y servir como herramienta para el mundo organizacional, rompiendo así muchas creencias arraigadas por años sobre los modelos de desarrollo y liderazgos y su vínculo directo con los resultados organizacionales. A partir de la comprensión de cómo funciona el cerebro, su anatomía y su fisiología, el neuroliderazgo define la base neural del liderazgo y la gestión de las personas. El comportamiento humano, la toma de decisiones, la motivación personal, la inteligencia emocional, la relación interpersonal, y la inteligencia y el aprendizaje individual y organizacional son aspectos que un buen líder debe tener en cuenta si desea ser competitivo y tener buenos resultados en el mundo moderno. El trabajo busca analizar el impacto de las competencias asociadas al neuroliderazgo en la mejora empresarial.

Eje Temático 7 : Economía y Empresa

Pósters

XXXIII

CONGRESO INTERNACIONAL
DE ECONOMÍA APLICADA

Asepelt

2019

economía azul

Universidade de Vigo



Asepelt

Asociación Internacional de Economía Aplicada



EL EMPRENDIMIENTO UNIVERSITARIO: UNA APROXIMACIÓN AL CASO GALLEGO

YAGO ATRIO LEMA

Equipo de Investigación Valorización Financiera/Universidad de Santiago de Compostela
Fac. CC. EE. EE. - Campus Norte/Universidad de Santiago de Compostela
Avda. do Burgo, s/n. 15782 Santiago de Compostela (España)/yago.atrio@rai.usc.es

GUILLERMO ANDRÉS ZAPATA HUAMANI

Fac. CC. EE. EE. - Campus Norte
Equipo de Investigación Valorización Financiera/Universidad de Santiago de Compostela
Avda. do Burgo, s/n. 15782 Santiago de Compostela (España)/guillermo.zapata@usc.es

ISABEL NEIRA GÓMEZ

Fac. CC. EE. EE. - Campus Norte
Departamento de Economía Cuantitativa/Equipo de Investigación Valorización Financiera /
Universidad de Santiago de Compostela
Avda. do Burgo, s/n. 15782 Santiago de Compostela (España)/isabel.neira@usc.es

e-mail Yago Atrio Lema: yago.atrio@rai.usc.es

Resumen

En la última década, en donde la falta de empleo ha mermado la economía en muchos países, en especial la de las regiones más desarrolladas, se ha apostado por el emprendimiento como un nuevo modelo de desarrollo. Este artículo analiza los determinantes del emprendimiento universitario en Galicia y si estos difieren a los del emprendedor con otros niveles de estudios. Para esto se emplean modelos de regresión logística con una muestra procedente del Global Entrepreneurship Monitor (GEM) para los años comprendidos entre 2008 y 2017. Así, analizando conjuntamente con determinantes relacionados con la crisis económica, se ha encontrado que la situación laboral, la renta, la percepción de oportunidades, el temor al fracaso, la percepción de los modelos de referencia y la percepción social del emprendimiento, son determinantes del emprendimiento-universitario y en algunos de ellos, difieren de los emprendedores con otros niveles de estudios.

Palabras clave: Emprendedores universitarios, determinantes del emprendimiento, regresión logística, GEM.

Eje Temático 7 : Economía y Empresa

RISK OF OVEREXPLOITATION OF RED TUNA: IMPLICATIONS FOR VALUE CHAIN MANAGEMENT

MARCELIANO RODRÍGUEZ RODRÍGUEZ

Facultade de Economía e Empresa/Universidade da Coruña
marceliano.rodriguez@udc.es

DOMINGO CALVO DOPICO

Facultade de Economía e Empresa/Universidade da Coruña
domingo.calvo.dopico@udc.es

ESTEFANÍA MOURELLE ESPASANDÍN

Facultade de Economía e Empresa/Universidade da Coruña
estefania.mourelle@udc.es

e-mail Marceliano Rodríguez: marceliano.rodriguez@udc.es

Abstract

The combined effect of an increase in fish demand and the globalization of markets is leading to a growing number of major stocks being considered overfished (e.g. red tuna). The measurement of overexploitation and achievement of sustainability turns into a main topic in fishery management.

The aim of this research is to analyse the risk of overexploitation of red tuna, and to evaluate its strategic implications for sustainable value chain management.

Models like Gordon-Schaefer (Schaefer, 1957) relate overexploitation with economic losses, by decreasing fish supply and raising costs. The supply shortage caused by a non-declining demand naturally lead to price rises. This way, the inverse relationship between growing trade prices and decreasing quantities of fish could serve as an indicator for overexploitation. Additionally, from a consumer perspective, signalization theory emphasizes the need for improvements in transparency and credibility in informative signals.

An analysis through time series has been carried for red tuna in its main producing markets: France, Japan, Spain, USA and Korea. Production and price series have been collected to study their correlation, and structural changes have been identified to point the start of overexploitation trends.

Results evidence a stable or decreasing supply, unable to cope with an increasing demand. The negative correlation between captures and prices reveals the risk of overexploitation in the five studied countries. The main implications for value chain management are focused in two main areas. On the one hand, is necessary to implement complete traceability, signalled by eco-labelling and backed by certification schemes. On the other hand, to develop education and training programmes targeted in promoting values such as cooperation along the value chain and conservation of the marine environment.

Palabras clave: Overexploitation, Marketing, Management, Fishery Sector, Value Chain.

Eje Temático 10 : Economía Azul. Del Mar y Actividades Marítimas

CONSUMER NEEDS AND PERCEPTIONS OF TRACEABILITY IN THE FISH SECTOR

BEATRIZ RODRÍGUEZ SALVADOR

Facultad de Economía y Empresa/Departamento de Empresa/Universidade da Coruña
Campus de Elviña, 15071 A Coruña /b.rodriguez1@udc.es

DOMINGO CALVO DOPICO

Facultad de Economía y Empresa/Departamento de Empresa/Universidade da Coruña
Campus de Elviña, 15071 A Coruña /domingo@udc.es

e-mail Beatriz Rodríguez: b.rodriguez1@udc.es

Resumen

Problema a resolver.- Los consumidores de productos agroalimentarios y pesqueros muestran cada vez más interés en la calidad y seguridad alimentaria. Este hecho resulta especialmente relevante en los mercados pesqueros donde los consumidores no solo encuentran dificultades a la hora de evaluar las propiedades intrínsecas del producto, sino que, además, cuentan con muy pocas señales informativas que les permitan inferir la calidad en el momento de la compra. En consecuencia, resulta cada vez más necesaria la implantación de mecanismos que simultáneamente garanticen y permitan al consumidor evaluar la calidad del producto.

Objetivo.- En este contexto, en el presente trabajo se pretende investigar el conocimiento que el consumidor tiene del término "trazabilidad" y su percepción del mismo. Adicionalmente, se evalúa la exigencia por parte del consumidor de implantar la trazabilidad en la cadena de valor junto con el perfil sociodemográfico y la categoría de producto adquirida.

Metodología.- Para dar respuesta a estos objetivos, se ha llevado a cabo una investigación tanto cualitativa como cuantitativa mediante la realización de un cuestionario personal a 296 responsables de compra en el hogar.

Resultados.- Los resultados han revelado que los consumidores de productos pesqueros tienen un escaso o nulo conocimiento del término "trazabilidad". La mayoría de los consumidores asocian espontáneamente la trazabilidad a origen y trayectoria. Sin embargo, al suministrarles determinados términos relacionados con la trazabilidad, los consumidores asocian la trazabilidad con seguridad alimentaria, origen, control de calidad e identificar y retirar alimentos en mal estado. Asimismo, nuestros hallazgos demuestran que si los consumidores cuentan con la información adecuada demandan la implantación de la trazabilidad en el mercado pesquero. En consecuencia, la trazabilidad se perfila como un herramienta eficaz y necesaria para satisfacer las demandas de los consumidores de garantías de calidad e información clara y fiable sobre los productos pesqueros.

Palabras clave: Trazabilidad, Productos pesqueros, Comportamiento del consumidor.

Abstract

Problem to solve.- Consumers of agri-food and fishery products are becoming increasingly interested in food quality and safety. This fact is especially relevant in the market for fishery products where consumers not only encounter difficulties in evaluating the intrinsic properties of the products, but also have very few cues to infer the quality at the time of purchase. As a result, there is a growing need for the implementation of mechanisms that simultaneously guarantee and enable consumers to evaluate the quality of the products.

Objectives.- In this context, this paper aims to investigate the understanding consumers have of the term "traceability" and its perception. Additionally, consumers' demand to implement traceability in the value chain is evaluated along with the socio-demographic profile and the category of product purchased.

Methodology.- In order to achieve these objectives, both qualitative and quantitative research has been carried out. The data were collected by questionnaire, in the form of personal interview with 296 persons responsible for purchase.

Results.- The results reveal that consumers of fishery products have little or no knowledge of the term "traceability". Furthermore, consumers spontaneously associate traceability to origin and trajectory. However, when prompted, consumers relate traceability with food safety, origin, quality control and identify and remove food in poor condition. Our findings show that, once informed, most consumers demand the implementation of traceability in the market for fishery products. As a result, traceability has emerged as an effective and necessary tool to meet consumers' demands for clear and reliable information and quality guarantees in the market for fishery products.

Key Words: Traceability, Fishery products, Consumer behaviour.

Eje Temático 7 : Economía y Empresa

EVALUACIÓN DE LA EFICIENCIA DE LAS UNIDADES FUNCIONALES DE ATENCIÓN PRIMARIA DEL DEPARTAMENTO DE SALUD VALENCIA CLÍNICO – LA MALVARROSA DE LA COMUNIDAD VALENCIANA

SILVIA GONZÁLEZ DE JULIÁN

Centro de investigación en Economía y Gestión de la Salud/Universitat Politècnica de València
Camino de Vera, s/n, Edificio 7 J 3ª planta, 46.002 Valencia (España)/silgonde@upv.es

ISABEL BARRACHINA MARTÍNEZ

Centro de investigación en Economía y Gestión de la Salud/Universitat Politècnica de València
Camino de Vera, s/n, Edificio 7 J 3ª planta, 46.002 Valencia (España)/ibarrach@upvnet.upv.es

RUTH USÓ TALAMANTES

Departamento de Salud Valencia Clínico – La Malvarrosa
Av. de Blasco Ibáñez, 17, 46010 Valencia (España)/uso_rut@gva.es

DAVID VIVAS CONSUELO

Centro de investigación en Economía y Gestión de la Salud/Universitat Politècnica de València
Camino de Vera, s/n, Edificio 7 J 3ª planta, 46.002 Valencia (España)/divivas@upv.es

e-mail Silvia González de Julián: silgonde@upv.es

Resumen

INTRODUCCIÓN: La atención primaria supone la puerta de entrada al sistema sanitario. Su buen funcionamiento condiciona el de la atención especializada y repercute directamente sobre la salud de la población. El gasto sanitario actual es muy elevado y su evolución es creciente debido al envejecimiento de la población y la incorporación de tecnologías cada vez más costosas.

OBJETIVO: Evaluar la eficiencia de las Unidades Funcionales (UF) de atención primaria del departamento de salud Valencia Clínico – La Malvarrosa.

METODOLOGÍA: Se utiliza el análisis envolvente de datos (DEA) para la valoración de la eficiencia. Como inputs se introducen las tasas de facultativos y personal de enfermería y los costes (personal, prescripciones farmacéuticas, imagen y laboratorio). Como outputs la eficiencia en la prescripción y las tasas de consultas, hospitalizaciones evitables, urgencias y mortalidad. Se consideran como variables exógenas el case-mix y el porcentaje de población mayor a 65 años. Previamente se realiza un análisis de componentes principales que ponga de manifiesto las correlaciones entre las variables y permita la selección de las más adecuadas para utilizar en los modelos.

RESULTADOS: Las dimensiones que más diferencian a las UF son tres. El factor 1 que está relacionado con la actividad asistencial (42,76%); el factor 2 con los recursos de personal (21,99%); y el factor 3 con la morbilidad (13,63%). La variable exógena más adecuada es el porcentaje de personas mayores de 65 años.

Los resultados dependen de las variables introducidas como inputs y outputs, aunque determinadas UF se muestran siempre eficientes. En cuanto a las holguras, los costes de farmacia y de personal son los más susceptibles de control.

CONCLUSIONES: El DEA es útil en la medida de la eficiencia, aunque precisa identificar los objetivos de las UF, ya que la perspectiva de los análisis influye en los resultados.

Palabras clave: Eficiencia, Atención primaria, Sector sanitario, DEA, Modelos no paramétricos.

Eje Temático 3 : Economía del Sector Público. Administración y Gobernanza

CENTROS DE EDUCACIÓN NO UNIVERSITARIA. UN ESTUDIO DEL MODELO

VALENTINA CUEVA LÓPEZ

Departamento de Estadística e Investigación Operativa/Universidad de Jaén
Campus Las Lagunillas s/n, 23071, Jaén/vcueva@ujaen.es

JOSÉ RODRÍGUEZ AVI

Departamento de Estadística e Investigación Operativa/Universidad de Jaén
Campus Las Lagunillas s/n, 23071, Jaén/jravi@ujaen.es

MARÍA JOSÉ OLMO JIMÉNEZ

Departamento de Estadística e Investigación Operativa/Universidad de Jaén
Campus Las Lagunillas s/n, 23071, Jaén/mjolmo@ujaen.es

e-mail Valentina Cueva López: vcueva@ujaen.es

Resumen

El número de centros educativos por municipio puede verse como una variable de conteo, que presenta una fuerte sobredispersión, y que, por tanto, podría ser descrito desde un punto de vista estadístico mediante los modelos habituales sobredispersos, procedentes de mixturas de la distribución de Poisson. Sin embargo, a diferencia de lo que ocurre con otros modelos sobredispersos, caracterizados por una mayor presencia de ceros, y valores muy extremos en la cola derecha, en el caso de centros públicos las variables presentan un bajo número de ceros, pero una gran frecuencia de unos (al menos un centro por municipio) y con valores máximos más bajos. La consecuencia estadística es que las distribuciones usuales no pueden modelizar ese perfil. Para esos casos se propone utilizar la distribución triparamétrica de Pearson compleja (CTP) o su versión bivariante, CBP. En este trabajo se describen ambas distribuciones y se realizan ajustes para las variables educativas mencionadas, en los que se comparan los ajustes CBP y CPT con los obtenidos por otras distribuciones (NB, GP, UGW, HP o COM-Poisson entre otras) a través de diferentes criterios de bondad de ajuste y se demuestra la mejora considerable que se obtiene al utilizar esas nuevas distribuciones. Para ello se toman datos procedentes de diferentes comunidades autónomas españolas, se muestran los perfiles con el comportamiento indicado y se comprueba que los ajustes son válidos y similares entre las comunidades.

Palabras clave: Sobredispersión, CTP, CBP, distribuciones de conteo, Centros de Enseñanza.

Abstract

The number of educational centers per municipality could be seen as a count data variable, which presents a strong overdispersion, and which, therefore, could be described from a statistical point of view using the usual overdispersed models, coming from mixtures of the Poisson distribution. However, unlike what happens with other overdispersed models,

characterized by a greater presence of zeros, and very extreme values in the right tail, in the case of public centers the variables have a low number of zeros, but a high frequency of some (at least one center per municipality) and with lower maximum values. The statistical consequence is that the usual distributions cannot model that profile. For these cases, it is proposed to use the Pearson complex triparametric distribution (CTP) or its bivariant version, CBP. In this paper both distributions are described and adjustments are made for the aforementioned educational variables, in which the CBP and CPT adjustments are compared with those obtained by other distributions (NB, GP, UGW, HP or COM-Poisson among others) through of different goodness-of-fit criteria and demonstrate the considerable improvement that is obtained when using these new distributions. For this, data from different Spanish autonomous communities are taken, the profiles with the indicated behaviour are shown and it is verified that the adjustments are valid and similar between the communities.

Key Words: Overdispersion, CTP, CBP, count data distribution, Educational centers

Eje Temático 2 : Economía Nacional, Regional y Local



CONFIGURACIÓN DEL EMPLEO TURÍSTICO Y MEDICIÓN DE LA EFICIENCIA EN LAS EMPRESAS HOTELERAS DE LAS ISLAS CANARIAS

MARTA ARBELO PÉREZ

Facultad de Economía, Empresa y Turismo/Departamento de Dirección de Empresas e Historia Económica/Universidad de La Laguna. Campus de Guajara, s/n, 38071. La Laguna, Tenerife. Islas Canarias. España/marbelpe@ull.edu.es

ANTONIO MANUEL ARBELO ÁLVAREZ

Facultad de Economía, Empresa y Turismo/Departamento de Dirección de Empresas e Historia Económica/Universidad de La Laguna. Campus de Guajara, s/n, 38071. La Laguna, Tenerife. Islas Canarias. España/aarbelo@ull.edu.es

MANUEL GONZÁLEZ DE LA ROSA

Facultad de Economía, Empresa y Turismo/Departamento de Dirección de Empresas e Historia Económica/Universidad de La Laguna. Campus de Guajara, s/n, 38071. La Laguna, Tenerife. Islas Canarias. España/mgonzale@ull.edu.es

JESÚS CÉSAR RODRÍGUEZ MORALES

Facultad de Economía, Empresa y Turismo/Departamento de Dirección de Empresas e Historia Económica/Universidad de La Laguna. Campus de Guajara, s/n, 38071. La Laguna, Tenerife. Islas Canarias. España/jrodrigm@ull.edu.es

e-mail Manuel González de la Rosa: mgonzale@ull.edu.es

Resumen

Las islas Canarias son un destino turístico de primer orden a escala mundial. En 2017, el turismo aportó el 35,2% al producto interior bruto (PIB) de la Comunidad Autónoma y el 40,3% de los empleos directos e indirectos (Exceltur, 2018). La cifra de visitantes alcanzó su record histórico, quedándose muy cerca de la barrera de los 16 millones, siendo la primera región europea en número de pernoctaciones en establecimientos alojativos (Eurostat, 2018). A pesar de ello, presenta uno de los mercados de trabajo más deteriorados de la UE.

La industria hotelera es uno de los principales motores de la economía del Archipiélago. Está asentada en, aproximadamente, el 1,7% de su superficie, concentrando alrededor del 92% de las plazas de alojamiento turístico ofertadas y el 95% de las pernoctaciones. El presente trabajo tiene como principal objetivo realizar un análisis de la situación del empleo en la industria hotelera de Canarias y calcular la eficiencia de costes de los establecimientos durante el periodo 2008-2017. La metodología a seguir conllevará estimar la eficiencia de cada hotel recurriendo a la aproximación de frontera estocástica y el modelo propuesto de Battese y Coelli (1995). Los resultados del estudio permitirán profundizar en el conocimiento del empleo en la empresa turística y detectar si existen diferencias significativas entre las eficiencias de los hoteles en los ámbitos provinciales del territorio insular.

Palabras clave: Turismo, Empleo, Hostelería, Eficiencia, Islas Canarias.

Eje Temático 7 : Economía y Empresa

Abstract

The Canary Islands are a world-class tourist destination. In 2017, tourism contributed 35.2% to the gross domestic product (GDP) of the Autonomous Community and 40.3% of direct and indirect jobs (Exceltur, 2018). The number of visitors reached its historical record, staying very close to the barrier of 16 million, being the first European region in number of overnight stays in accommodation establishments (Eurostat, 2018). Despite this, it presents one of the most deteriorated labor markets in the EU.

The hotel industry is one of the main engines of the economy of the Archipelago. It is located in approximately 1.7% of its surface, concentrating around 92% of the tourist accommodation places offered and 95% of overnight stays. The main objective of this paper is to analyze the employment situation in the Canarian hotel industry and calculate the cost efficiency of the establishments during the 2008-2017 period. The methodology to follow will entail estimating the efficiency of each hotel resorting to the stochastic frontier approach and the proposed model of Battese and Coelli (1995). The results of the study will allow to deepen the knowledge of the employment in the tourist company and to detect if there are significant differences between the efficiencies of the hotels in the provincial areas of the insular territory.

Key Words: Tourism, Employment, Hospitality, Efficiency, Canary Islands.

Thematic axe 7 : Economy and Business



Vigo 19 a 23
junio

XXXIII

CONGRESO INTERNACIONAL
DE ECONOMÍA APLICADA

Asepelt

2019

economía azul

www.asepelt2019.es

Organiza

Universidade de Vigo



Asepelt

Asociación Internacional de Economía Aplicada

Colabora



CONCELLO
DE VIGO

