

**INTERNATIONAL DIVERSIFICATION AND PERFORMANCE IN
AGRI-FOOD FIRMS**

Raúl Serrano*, Marta Fernández-Olmos+ and Vicente Pinilla**

** Department of Business Administration, Universidad de Zaragoza, Facultad de Economía y Empresa, Gran Vía 4, 50005 Zaragoza, Spain. E-mail: raser@unizar.es*

+ Department of Business Administration, Universidad de Zaragoza, Facultad de Economía y Empresa, Gran Vía 4, 50005 Zaragoza, Spain. E-mail: maferno@unizar.es

*** Department of Applied Economics and Economic History, Universidad de Zaragoza, Facultad de Economía y Empresa, Gran Vía 4, 50005 Zaragoza, Spain. E-mail: vpinilla@unizar.es*

Abstract:

This paper studies the relationship between international diversification and performance in agri-food firms. In line with the recent literature, it analyses the effects of the degree of internationalization using a uniform sample, a long-term focus and a measure that combines export intensity and regional diversification. The study empirically confirms the hypothesis of a horizontal S-curve relationship between diversification and performance and identifies three phases. Novice export firms are found in the first stage; their profits are low because they incur in the initial costs of exporting. Mature companies with a more advanced internationalization process are in the second stage; they benefit from the positive outcomes of operating at a larger scale. Lastly, the third stage contains internationally over-diversified companies; their performance decreases as a result of costs to enter extra-regional markets, which are especially steep in this sector, and dealing with greater organisational complexity.

JEL Classification: F23, L66, Q13

Key Words: Agribusiness, International diversification, Firm performance, Degree of Internationalization

Acknowledgements:

This study has received financial support from the Government of Spain, through its Ministry of Economy and Competitiveness, projects ECO2012-36290-C03-01 and ECO 2012-33286. It has also received backing from the European Social Fund and the Government of Aragon, through the Research Groups 'COMPETE' and 'Agri-food Economic History (nineteenth and twentieth centuries)'. We are grateful for the comments made by Alex Rialp, Raquel Flórez and Lucio Fuentelsaz. The usual disclaimers apply.

INTERNATIONAL DIVERSIFICATION AND PERFORMANCE IN AGRI-FOOD FIRMS

Abstract:

This paper studies the relationship between international diversification and performance in agri-food firms. In line with the recent literature, it analyses the effects of the degree of internationalization using a uniform sample, a long-term focus and a measure that combines export intensity and regional diversification. The study empirically confirms the hypothesis of a horizontal S-curve relationship between diversification and performance and identifies three phases. Novice export firms are found in the first stage; their profits are low because they incur in the initial costs of exporting. Mature companies with a more advanced internationalization process are in the second stage; they benefit from the positive outcomes of operating at a larger scale. Lastly, the third stage contains internationally over-diversified companies; their performance decreases as a result of costs to enter extra-regional markets, which are especially steep in this sector, and dealing with greater organisational complexity.

JEL Classification: F23, L66, Q13

Key Words: Agribusiness, International diversification, Firm performance, Degree of Internationalization

1. INTRODUCTION

This paper studies the relationship between international diversification and performance. Since the results of previous papers have varied, the academic debate is still open (Chen and Tan, 2012; Hsu et al., 2013; Beleska-Spasova, 2014). This paper presents an analysis for a uniform sample of companies with a long horizon, which is quite unusual. Some previous studies have considered a set of companies belonging to sectors with a very disparate performance, which could have skewed the results they obtained.

The intense globalisation process of economic activity has turned the internationalization process into an essential condition for the survival and success of some agri-food firms. The generalised idea of international expansion being good for the company is a recurrent argument used by politicians and the press and promoted by business associations and organisations. However, entering international markets is still a challenge for a number of companies in the industry. Crossing the border involves the initial costs of the internationalization process and then competing and organising the activities in a more uncertain and complex environment. Therefore, understanding the relationship between firms' internationalization and performance is a crucial area of research not only for academics, but also for professionals and politicians (Hsu et al., 2013; Powell, 2014).

In this context, this paper empirically confirms the hypothesis of a horizontal S-curve relationship between international diversification and performance and identifies three phases in the internationalization process. Novice export companies are found in the first phase; their profits are low because they incur in the initial costs of exporting. Mature export companies with a more advanced internationalization process are in the second phase; they benefit from the positive outcomes of operating at a larger scale. Lastly, the third phase contains internationally over-diversified exporting companies whose performance decreases as a result of costs to enter extra-regional markets, which are especially steep in this sector, and dealing with greater organisational complexity.

The database used for empirical confirmation is the *Encuesta sobre Estrategias Empresariales* (ESEE—Survey on Business Strategies), a longitudinal panel from 1994 to 2012 comprising 322 companies in the Spanish food industry.

We believe that this paper makes a relevant contribution to the existing literature as it offers new empirical evidence on the relationship between internationalization and business performance using a uniform sample of companies and a very broad time horizon.

Secondly, in line with the recent literature, we have studied the degree of internationalization with a measure that combines export intensity and regional diversification.

Furthermore, from a sector perspective, it represents a significant advance in our knowledge of the performance of the agri-food industry in international markets. Despite the importance of this sector, research on it has been very limited in comparison with studies covering other sectors (Kirca et al., 2012). The effects of the degree of internationalization or the effects of geographical diversification on business performance have not yet been defined in the food industry. We know that the food industry faces major barriers to entering international markets; a large number of them are technical, concern food safety or are customs hurdles, and they all narrow export companies' margins (Henry de Frahan and Vancauteran, 2006). Given that the characteristics of the agri-food business clearly differ from those of other sectors, discovering the impact on company performance of a higher degree of international diversification, or the influence of other relevant company characteristics, for example product and process innovations, from the specific perspective of this industry is of interest.

The prior literature that has analysed the sector generally offers descriptive and cross-sectional studies (Fernández-Olmos, 2011; Fernández and Díez, forthcoming). As Chiao et al. (2006) highlight, longitudinal studies are more appropriate for capturing the dynamic nature of the internationalization phenomenon of companies. Therefore, we also contribute to the aforementioned literature by studying the business results of the internationalization process for a very broad period: 1994–2012.

The paper is structured as follows: the main characteristics of the internationalization process of the Spanish food industry are presented after this introduction. The second section contains the theoretical framework and the study hypotheses. The third section describes the data employed and the econometrics method used. The fourth section demonstrates the results of the empirical analysis. The last section provides a discussion of the results and presents the conclusions.

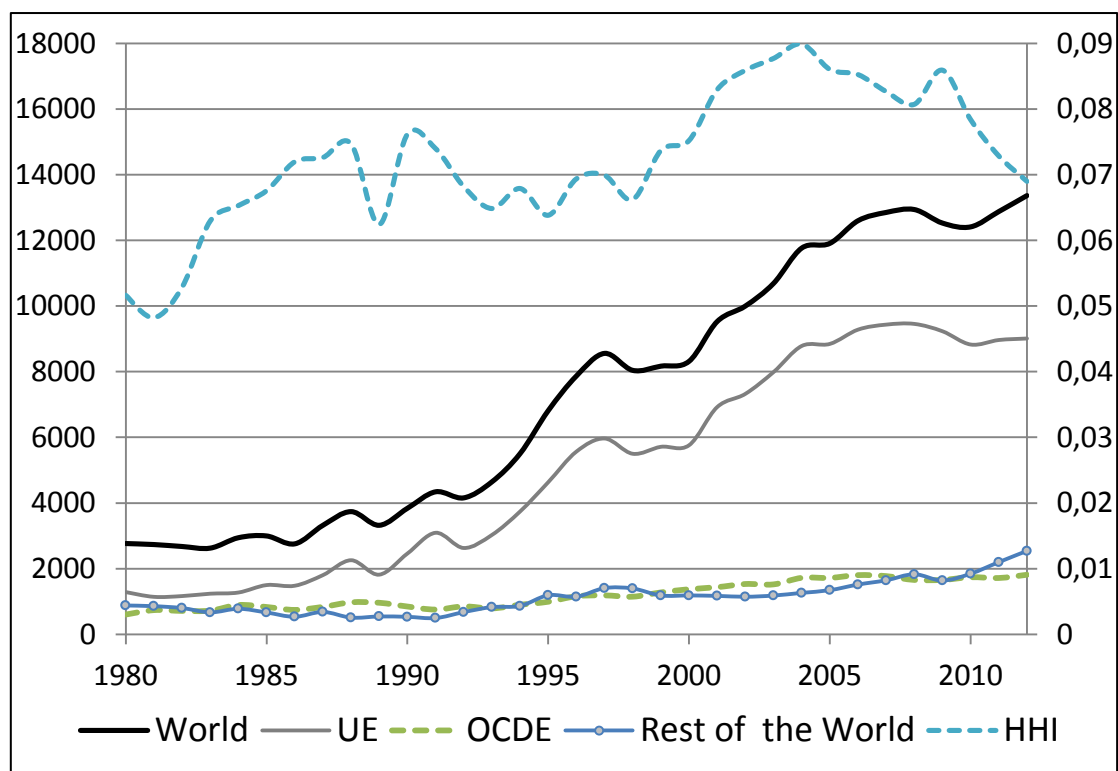
2. CONTEXTUALISATION: THE INTERNATIONAL DIVERSIFICATION OF SPANISH FOOD FIRMS

The food industry is the main manufacturing industry in Europe, representing 14.9 per cent of total sales (Food Drink Europe, 2012) and over one third of world trade in agricultural products and food (Serrano and Pinilla, 2014). In Spain, the sector making the largest contribution to gross domestic product after metal is the agro-industrial complex representing over 20 per cent of the sales of the manufacturing sector and employing around 15 per cent of persons in employment (Industrial Survey. INE [Spanish Statistical Office], 2012). According to data from the economic report by the *Federación Española de Industrias de Alimentación y Bebidas* (FIAB, the Spanish Federation of Food and Drink Industries) it was consolidated as the first export sector in 2013. Industry exports attained a value of 38 thousand million euros in 2013, which represented 16 per cent of total exports in Spain.

The development of exports in the Spanish food and drink industry indicates a major internationalization process. Advances in the international expansion of industry are reflected in both the growing intensity of sales abroad (between 1970 and 2012 the mean annual increase in exports was around 4 per cent) and the rising number of destination countries for the exports (over 175 geographical locations in 2012).

As the following figure shows, the majority of the process can be explained by the intensification of intra-regional trade. After Spain joined the European Union (EU), the percentage of exports to this destination climbed until it reached levels above 80 per cent out of the total. Since the end of the integration transition period in 1992, the restructuring of Spanish exports has consolidated the community market as the natural destination for its products, while the rest of the world has decreased in importance (Contreras and Bacaria, 2000; Clar et al., 2015).

Figure 1. The development of exports in the Spanish food, drink and tobacco industry between 1970 and 2012 (millions of 2005 US dollars) and normalised Herfindahl-Hirschman Index



Data Source: UN-COMTRADE (2013)

According to the normalised Herfindahl-Hirschman Index (HHI)¹ of geographical diversification of exports in volume terms (taking 175 destinations into account, right axis of figure 1) the growth of the concentration during the majority of the last decades is considerable, as the greater importance of flows with European partners demonstrates. Finally, some diversification has been seen in the past decade comprising both increasing exports to new EU partners from Eastern Europe and more importance recently of non-European exports.

¹ Normalised Herfindahl-Hirschman Index. Where: H is the Herfindahl-Hirschman index of geographical diversification, n = number of export countries.

Table 1. Distribution of food, drink and tobacco industry exports by destination regions, 1980–2012 (in percentages)

1980	UE	46.50	OCDE	21.75	Rest of the W.	31.76
	United Kingdom	13.38	USA	11.20	Lybia	5.57
	The Netherlands	8.25	Switzerland	3.34	Algeria	2.81
	Germany	8.09	Canada	1.74	Venezuela	2.51
	France	5.17	Mexico	1.43	Morocco	2.45
	Italy	4.09	Turkey	1.43	Andorra	2.34
1990	UE	64.10	OCDE	22.04	Rest of the W.	13.86
	Italy	17.81	USA	11.26	Andorra	2.81
	France	11.90	Switzerland	2.72	Algeria	1.99
	Germany	9.10	Turkey	2.02	Brazil	0.99
	United Kingdom	8.20	Mexico	1.51	Saudi Arabia	0.70
	The Netherlands	5.55	Canada	1.28	Tunisia	0.62
2000	UE	69.26	OCDE	16.51	Rest of the W.	14.24
	France	16.53	USA	8.54	Russia	1.40
	Italy	12.55	Switzerland	1.50	Andorra	1.13
	Portugal	11.46	Japan	1.42	Saudi Arabia	0.73
	Germany	8.60	Mexico	1.00	Morocco	0.69
	United Kingdom	7.85	Australia	1.00	Lybia	0.67
2012	UE	67.42	OCDE	13.57	Rest of the W.	19.01
	France	16.92	USA	5.45	Emirates A.	1.70
	Portugal	11.56	Mexico	1.45	Russia	1.51
	Italy	11.09	Japan	1.44	China	1.43
	Germany	8.50	Switzerland	1.27	Saudi Arabia	1.23
	United Kingdom	7.64	Canada	0.84	Algeria	1.20

Data Source: UN-COMTRADE (2013)

The Spanish food and drink industry has focused its exports on large-scale regional markets in developed and geographically close countries (Clar et al., 2015). Breaking down Spanish agricultural exports by destination region highlights that the removal of barriers to enter the EU intensified the degree of internationalization and the importance of this region; however, it did not vary the main destination markets of Spanish exports (France, Italy, Germany and the United Kingdom have always been very important countries for Spanish trade). The only relevant exception is Portugal, which has increased its purchases since it joined the EU to take second place around 2012. The process of redirecting flows towards the region especially affected other countries in the OECD, which have gradually decreased in importance, especially the United States in the last decade. Also noticeable is the recent rising importance as export destinations of countries in other regions, namely Russia, China and Arab countries, although their participation is still relatively small.

To sum up, the internationalization of Spanish agri-food companies has increased, especially in exports to traditional European markets, due to a significant decrease in transaction costs in these markets due to

the removal of trade barriers and the uniformity of food safety standards in the region. Although Spanish companies are increasingly exporting to more countries, it is only in recent years that the geographical diversification of Spain's exports can be considered of any significance. The recession in Europe has led Spanish firms to seek to grow sales in markets that differ greatly to their traditional ones, for example Arab countries, China and Russia. However, companies operating outside the European region are confronted with highly protected markets commercially and the steep costs of adapting their products to local regulations (Serrano and Pinilla, 2011).

3. THEORETICAL FRAMEWORK: INTERNATIONALIZATION AND PERFORMANCE IN FOOD COMPANIES

This section covers the process of company internationalization from a dynamic perspective. According to the Uppsala Model, the internationalization of companies follows a sequential process that depends on the gradual accumulation of knowledge of external markets (Johanson and Vahlne, 1977). This model, together with learning by exporting theory, presents the benefits of internationalization: the appearance of new business opportunities as new business relationships are established, while the ones already established are exploited (Johanson and Vahlne, 1990). To explain the expansion of operations to new markets, the Scandinavian school used the concept of 'psychological distance', comprising a set of barriers that hinder a company's internationalization (Johanson and Wiedersheim-Paul, 1975).

3.1. Benefits of Internationalization

A variety of benefits stem from the geographical expansion of company operations. An incremental focus and obtaining economies of scale, scope and experience are probably the most used reasons in the literature to explain company internationalization. Investment in the company's property, plant and equipment and sunk costs into overseas expansion require companies to have a minimum volume of operations to reach the profitability threshold. Increasing the intensity of international operations and entering new markets sequentially form the usual procedure to achieve economies of scale. In some cases the increase of results became from the possibility of using several assets across product families (economies of scope). Lastly, as mentioned above, as companies increase their foreign operations, they acquire more knowledge of markets, which translates into taking advantage of economies of experience.

Based on an incremental process focus, an increase in the volume of operations abroad results in a decrease in the mean cost.

A second group of arguments that are well documented in the literature can explain the international expansion of companies. These include: the diversification of risks (Annavarjula and Beldona, 2000) by operating in markets with a changing cycle, for example; improving performance by leveraging specific assets abroad, for example exploiting the competitive edge of innovations in various markets (Buckley, 1988; Caves, 1996; Delios and Beamish, 1999); and obtaining benefits from exploiting market imperfections (Caves, 1971).

3.2. Costs of Internationalization

Following the theory of transaction costs, companies in the internationalization process face the costs of entering new markets and an increase in coordination costs arising from international expansion.

On the one hand, related to the 'psychological distance' concept, companies tackle markets they do not know. In the initial stages especially, companies incur 'research and information costs' since they have to spend time and effort on researching the target market and adapt their products to local consumer tastes and very diverse regulations. On the other, they also incur an increase in 'negotiation and decision costs' as they have to contact intermediaries, compile information on offers, travel to establish trade networks, decide, negotiate, draft contracts and finally take out risk cover.

Lastly, as the company increases the volume of its foreign operations and diversifies, it incurs more 'supervision and control costs' to comply with agreed conditions. Transaction costs rise, especially in very distant markets, and transport costs are also steep, since the environments differ greatly and the barriers to market entry, associated with trade protection policies or even a wide variety of regulatory and technical reasons, are difficult to overcome. For some authors, such as Anderson and van Wincoop, the key to decreasing coordination costs is the stability of the regulatory framework, or compliance with the guarantees of property rights (Anderson and van Wincoop, 2003).

3.3. Relationship between the degree of internationalization and performance

Internationalization, therefore, is the consequence of a process of incremental adjustments to the changing conditions of the company and its environment (Johanson and Vahlne, 1977). The issue of whether there is a positive relationship between internationalization and performance, or whether there is an optimal degree of internationalization are very controversial subjects (Hsu et al., 2013; Powell, 2014). Ruigrok and Wagner (2005) and Wagner (2012) review papers covering this aspect with very disparate results. Some of them have a positive linear relationship, others a negative effect and others have curvilinear U-shaped or inverted U-shaped relationships with a positive or negative effect based on the company's degree of internationalization.

In an attempt to synthesise previous work, some authors have proposed a horizontal S-shaped relationship (Contractor et al., 2003; Lu and Beamish, 2004; Li, 2005). Contractor et al. (2007) classify companies into various stages depending on their degree of internationalization: novice exporters (Phase 1) are firms that have just started their international expansion and are facing the initial costs of crossing the border; mature exporters (Phase 2) are companies intensifying the internationalization process and reaping the positive benefits of the increase in the volume of their business; and lastly highly internationalised firms (Phase 3) are companies whose export and geographical diversification has intensified to the extent that they face additional costs arising from greater management complexity. Consequently, firms in the third phase suffer a negative effect on performance again.

This study will try to validate this three-phase model empirically for a uniform sample of companies in the food industry. Some studies have already shown that regionally-focused companies are better represented by a horizontal S-shaped relationship. We believe that Spanish exporting food companies match this model due to the above-described characteristics. As we will see, the majority of the companies in the industry show very limited degrees of diversification as they concentrate their exports in nearby markets. Access to liberalised European markets, as opposed to the still very high barriers imposed in more distant markets, means that the destination for the Spanish agri-industry export is mainly intra-regional.

3.4. The three phases of the internationalization process of the Agri-food exporter

First phase (negative slope)

The international expansion of firms involves entering unknown markets and incurring an increase in transaction costs. Firms face costs to seek information, research markets (Hofstede, 1980), visit sales people and intermediaries, negotiate contracts and supervise compliance. The cost of this learning is also accompanied by an increase in coordination and communication costs (Rosenzweig and Singh, 1991).

From the sector's point of view, the food exporter also needs to adapt the product to technical safety and quality standards, to the requirements of a new label, a new language in some cases, and the logistics to preserve products, since some are perishable. Firms face steep initial costs in this first stage, which narrow their margins. Implicit behind this argument is the incremental internationalization theory Johanson and Vahlne (1977) proposed. Obviously, many costs will occur at any stage in international expansion. However, in terms of impact on performance, the negative influence in this first phase is greater since the initial high costs are distributed in a volume of business that is still very small. Consequently, the negative effect on performance in the first phase comes from the combination of the steep initial costs of crossing the frontier and an insufficient scale.

Second phase (positive slope)

In the second phase the company benefits from the larger scale of its international operations, which increases its performance. The main characteristic of this phase is taking advantage of the economies of scale, of scope and of experience related to more foreign activity (Buckley and Casson, 1976; Caves, 1996). Furthermore, as in the other stages, it is well documented in the literature that internationalised companies perform better due to the diversification of risks (Annavarjula and Beldona, 2000), leveraging of specific assets abroad (for example innovations), which are the source of competitive advantage (Buckley, 1988; Caves, 1996; Delios and Beamish, 1999) or obtaining benefits from the exploitation of market imperfections (Caves, 1971).

In this new phase, the agri-food firm has already overcome initial product adaptation costs, has established more stable distribution networks and can diversify geographically by taking advantage of

economies of scale. The positive effects of international expansion occur once the firm has crossed the threshold of necessary business, after the export volume that reduces the mean cost of the operations has been reached, and it has also accumulated experience to exploit opportunities in other nearby markets, in our case spread like an oil stain through the European region.

Third phase (negative slope again)

This last phase contains companies that have over-internationalised, which have gone slightly beyond the desirable optimal level. For these companies, more international expansion increases costs, which again makes the company's performance slope negative. There are several reasons for this. Some authors highlight the increase in coordination costs associated with geographical dispersion as they have to deal with various different regulations (Sundaram and Black, 1992). Others emphasise that directors face more complexity (Grant, 1987), information overload (Hitt et al., 1997), loss of information or distortion in governance (Hoskisson and Turk, 1990). Lastly, the institutional and cultural diversity of entering more diverse environments has a negative influence on costs (Bartlett and Ghoshal, 1989).

Food trade is also subject to a series of special characteristics that can help us understand the negative slope of companies in this last phase. As mentioned above, it is a much protected sector regulated outside the frontiers of regional blocks (Serrano and Pinilla, 2014). Therefore, companies that decide to export on a more global scale face higher costs due to an increase in trade barriers. If we add to this the higher cost of operations resulting from a longer physical and mental distance, and that in some cases geographical diversification occurs in very small markets, the outcome is worse margins in foreign operations.

In this context, this paper proposes to test the following hypothesis:

Hypothesis 1: The relationship between international diversification and performance in food companies results in a horizontal S-shaped curve with three phases:

In the **first phase**, the degree of internationalization has a negative impact on company performance.

In the **second phase**, the degree of internationalization has a positive impact on company performance.

In the **third phase**, the degree of internationalization has a negative impact on company performance.

4. DATA, MODEL AND RESULTS

4.1. Database

The data we used come from the *Encuesta sobre Estrategias Empresariales* (ESEE), a panel survey on business strategies conducted by the SEPI Foundation backed by the Ministry of Industry of Spain. This survey offers information on the strategies of Spanish manufacturing companies for the 1990–2012 period. The ESEE has already been used in several other papers. These have highlighted its representativeness as a sample and its unique information on business strategy. In our case it contains relevant information on the internationalization of companies.

The empirical work uses a longitudinal panel between 1994 and 2012 comprising companies in the following business sectors: (1) Meat industry; (2) Food and tobacco products; and (3) Beverages. The three groups selected from the ESEE correspond to the groups in the food, beverages and tobacco industry contained in NACE-2009. Only exporting companies have been taken into account in the empirical model.

4.2. Econometric model

Dependent variable

In the majority of the studies, company performance is based on return on assets (ROA). This study has used return on sales (ROS). This is the profitability indicator the ESEE presents and it is earnings before interest, tax and depreciation on sales. Some previous studies have already used this indicator successfully (Almodóvar, 2012; Almodóvar and Rugman, 2014; Fernández and Díez, forthcoming). It is also a measure that does not suffer from problems arising from the varied handling of depreciation.

Independent variables

The degree of internationalization (DOI) is a compound indicator that takes into account exporting intensity and the regional diversification of export destinations. In line with Grant et al. (1988), Pangarkar (2008) and Fernández-Olmos (2011), DOI is calculated on the basis of export intensity (proportion of foreign sales), in the numerator of the expression, and the regional diversification of exports, in the denominator. The latter is a Herfindahl index varying between 0 and 1. The data have been calculated on sales and the

value of the exports in the ESSE. The regional export quotas are the proportion of the regional destination of exports that the ESSE asks about. For this study, which uses a broad time horizon, we had to bring the information together in three regions, which are the ones mostly surveyed in the nineties: European Union, OECD and Rest of the World.

$$DOI = \frac{\text{Proportion of foreign sales}}{\sum_{i=1}^n (\text{Proportion of sales in región}_i^2) (0 \leq H \leq 1)} \times 100$$

To study the effects of the degree of internationalization in its various phases, DOI is introduced in the model to analyse the effects in the first phase. **DOI²** for the second phase and **DOI³** for the third and last phase. A summary of the variables, measures and expected direction of influence on the business results is shown in table 3.

Table 3. Model, variables, measures and expected effect on performance

$$ROS_{it} = \beta_1 + \beta_2 DOI_{it} + \beta_3 DOI_{it}^2 + \beta_4 DOI_{it}^3 + \beta_5 \ln(Size_{it}) + \beta_6 Age_{it} + \beta_6 Int_ADV_{it} + \beta_7 Innovate\ product_{it} + \beta_7 Innovate\ process_{it} + U_{it} \quad (1)$$

Variables	Measures	Expected effect
Dependent variables		
ROS	Return on sales	
Independent Variables		
DOI	1st Phase degree of internationalization	Negative
DOI ²	2nd Phase degree of internationalization	Positive
DOI ³	3rd Phase degree of internationalization	Negative
Control variables		
I_Size	Logarithm of the number of employees	Positive
Age	Age of the firm	Ambiguous
Int_ADV	Advertising costs / total sales	Positive
Innova product	(Dummy , Yes=1) Innovate Product	Positive
Innova process	(Dummy , Yes=1) Innovate Process	Positive

Control variables

Obtaining a robust result from the relationship between the degree of internationalization and performance requires control using variables that can also affect the firm's results. Thus the empirical model includes the approximate firm size (**Size**) using the logarithm of the number of employees at the firm; a positive influence on the result is expected (Acedo and Jones, 2007; Richter, 2007).

We also control using the **Age** of the firm. The effect of the age of a firm during internationalization is ambiguous. On the one hand, older companies are usually more stable than younger companies in their provision of resources; therefore, they have more capacity (Zahra and George, 2002). Young firms, on the other hand, are not as rigid, and they have the advantages of the learning effect (Autio et al., 2000; Sapienza et al., 2006). Age is calculated using the number of years (plus one) from the year the firm was established up to the year in which the survey is taken (Anderson and Reeb, 2003).

In accordance with Dunning's resource theory and eclectic paradigm (1976), firms with unique intangible resources can exploit their advantage in foreign markets (Lu and Beamish, 2004). Consequently, the model includes the **Innovate Product** and **Innovate Process** variables by means of two fictitious variables, which take the value 1 if the firm innovated, and zero if it did not. The model also includes the intensity of the firm's marketing activities (**Int_ADV**). This is approximate based on the quotient resulting from the firm's advertising costs divided by total sales (one example in Qian et al., 2010).

Before continuing with the empirical study, the paragraphs below describe the main characteristics of food exporters in the sample. The table below contains the values of some variables related to internationalization between 1994 and 2012. It shows, firstly, that the number of firms that joined international markets increased. In 1994, 101 out of the 207 surveyed firms in the sector were in foreign markets. In 2002, the number had risen to 135 out of 227. And in the last year, 2012, 178 out of 338 firms had internationalised. This represented 56% of the firms in the industry.

Looking at the variables in detail, we can observe that food exporters can be classified as large companies. In 2012 they employed a mean of 227 workers. Although size is one determining business characteristic in internationalization processes, innovation or marketing capacity are factors that influence a firm's growth strategies and the success of its international expansion process (Altomonte and Nicolini, 2012). As seen in table 4, food companies tend to invest in innovation activities. Referring to 2012 data, on average, around 20 per cent of the surveyed exporters innovated their products during the year, and 41 per cent were innovative in processes. In 1998, for example, 4.6 per cent of their sales were allocated to advertising investment. These are companies with an average age of around 36 years.

Lastly, exporting companies allocate a higher volume of resources to marketing practices. Despite the drop in more recent years, the percentage is always more than the industry average.

Table 4. Spanish food company indicators

	1994	1998	2002	2006	2012
Number of firms	101	123	135	161	189
ROS	11.4	9.4	8.6	10.1	8.1
DOI	29.6	34.8	32.2	30.2	35.9
Size	513.9	363.3	409.4	324.2	227,4
Age	33,9	35,6	36,2	36,2	36.7
Int_ADV	4,7	4,6	4,9	3,5	2.7
Innova product	33.6	30.9	31.1	31.1	20.1
Innova process	42.6	44.7	35.6	42.2	41.0

Data Source: ESEE.

4.3. Methodology

The estimation technique used is panel data, since it allows us to take both variations between companies and time variations in the explanatory variables into account. Besides technical reasons, there are also theoretical reasons to prefer estimations using panel data, as previous papers have outlined (Almodóvar, 2012). From this perspective, three types of panel data estimations are proposed; the first, ordinary least square (OLS) with the grouped panel; the second and third consider the time variation by including random effects (REM) and fixed effects (FEM), respectively.

To determine which of the three models is the most suitable, we firstly proposed the Breusch-Pagan LM test for random effects. This test makes it possible to select between the OLS estimation of the grouped panel and the estimation with random effects. After testing, we concluded that the random effects are relevant, and, therefore, the use of the estimation including them was preferable to the grouped panel estimation. To demonstrate that the estimation of fixed effects is a better method than OLS, we conducted the F significance test for fixed effects (FEM) (Greene, 2000). This test shows us that the FEM estimation is more suitable than the OLS estimation of the grouped panel. Furthermore, the Hausman test demonstrated that the random-effect and fixed-effect estimators differ substantially and that the fixed-

effect model better explains the sources of variation and, therefore, it is more convenient than the random-effect model.

It is important to note here that even after modelling heterogeneity in time and space, according to the Wald test (Greene, 2000) our model raises problems of heteroscedasticity. Furthermore, according to the Wooldridge test (Wooldridge, 2001), the estimation presents autocorrelation problems. The problems were solved using fixed-effect estimation with the panel-corrected standard errors (PCSE).

4.4 Results

After the specification problems of the estimators were solved, the models worked well, explaining 45.4 per cent of variations in performance. Columns 1-3 of table 5 contain the coefficient, standard errors between brackets and the statistical significance of the variables (at *** 1%, ** 5% and * 10%) by means of FEM regression with PCSE.

Column 1 shows the proposed model for just one phase in the internationalization of companies. Column 2 proposes a model with two phases, in other words it includes DOI and squared DOI. Lastly, column three presents the model with three phases. Besides DOI and squared DOI, it also includes cubed DOI. As shown, the variables DOI_t , DOI^2_t , DOI^3_t present statistical significance and the expected sign. No significance is found in DOI_t in the first model and in DOI_t , DOI^2_t in the second model. This validates the hypothesis of the internationalization model in three phases and the horizontal S-shaped relationship, since DOI_t presents a coefficient with a negative sign, DOI^2_t a positive coefficient and DOI^3_t again presents a coefficient with a negative sign.

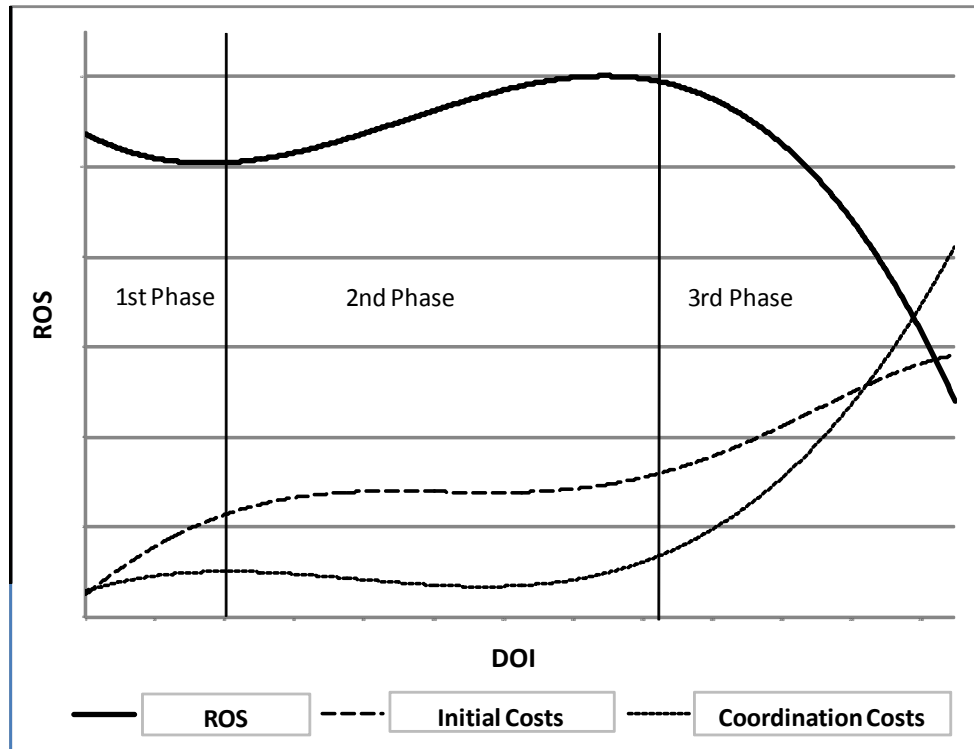
Table 5. Results of the FEM regression with PCSE

Variable	(1) One-Phase	(2) Two-Phase	(3) Three-Phase
DOI_t	0.015 (0.02)	0.07 (0.02)	-0.089* (0.04)
DO^{A2}_t	...	-0.000 (0.00)	0.002** (0.00)
DOI^{A3}_t	...	...	-3.57(e-6)** (1.77e-6)
I_Size_t	1.643* (0.96)	1.636* (0.96)	1.580* (0.95)
Age_t	-0.154** (0.06)	-0.151** (0.06)	-0.136** (0.06)
Int_ADV_t	-0.002 (0.02)	-0.002 (0.02)	-0.001 (0.02)
$Innova\ product_t$	1.415** (0.62)	1.409** (0.62)	1.349** (0.62)
$Innova\ process_t$	-0.406 (0.54)	-0.403 (0.54)	-0.405 (0.54)
Constant	11.77* (6.30)	11.86* (6.28)	12.88** (6.11)
Observations	2.647	2.647	2.647
Firms	342	342	342
R-Squared	0.45	0.45	0.45
Prob>X2	0.00	0.00	0.00

Note: *** $p < 0.01$ ** $p < 0.05$ and * $p < 0.10$ denote 1, 5 and 10 per cent of the statistical level of significance, respectively. Standard errors are presented between brackets.

The following figure presents a horizontal S-shaped (or sigmoid curve) relationship between the degree of internationalization and performance in a Spanish food exporter. We find novice companies in the first phase tackling the initial costs of the internationalization process that result in a decrease in their margins. The second phase contains mature companies with a more advanced internationalization process that reap the positive outcomes of operating at a larger scale. Lastly, the third phase contains internationally over-diversified agro-exporters whose performance is falling. This is related to the new costs of exporting to more distant markets, with more barriers to entering and with greater organisational complexity associated with a more geographically diversified model.

Figure 2. The three phases of the Agri-food exporter



All the models provide the same results for the control variables. As predicted, the size of the company is the determining variable in company performance. The coefficient of the size variable, which is an approximation based on the number of employees, shows a positive sign and statistical significance. Furthermore, exporting companies that innovated their products present better business results (see row 7, column 3, statistical significance and coefficient of the **Innovate product** variable). However, the **Age** variable includes a negative effect on company performance. As already mentioned, some previous papers also demonstrate this effect (Zou and Stan, 1998; Almodóvar, 2012). The other variables, **Int_ADV** and **Process innovation** contain neither a positive effect nor statistical significance. The results of the marketing intensity variable are in line with Caves' argument (1981) that marketing does not play a determining role outside national borders. The lack of significance of the process innovation variable corroborates the new trade theories that emphasise product innovations above process innovations (Becker and Egger, 2007).

5. CONCLUSIONS

This study has researched the relationship between the degree of internationalization and company performance for a uniform sample of agro-industry firms. The debate continues to be open since the results of previous papers have varied.

This paper presents new empirical evidence for a broad time horizon using a uniform sample of companies, thus mitigating the problems of other studies that covered a wide range of sectors. We have conclusively confirmed the existence of a horizontal S-shaped relationship between international diversification and performance for Spanish food exporters.

Secondly, in line with the recent literature, we have studied the influence of the degree of internationalization with a measure that combines export intensity and regional diversification. The use of measures that only take export intensity into consideration without placing any importance on the destination could also explain the contradictory results of prior studies.

Lastly, this paper specifically studies the food industry and the number of prior studies on this sector is very low. Taking into account the type of transaction costs agri-food companies face, our results show a horizontal S-shaped relationship between international diversification and performance. Our work shows that the internationalization process of a Spanish food firm is more regional than global. The results specifically show how international over-diversification reduces company margins for food exporters. As described above, operations on a more global scale outside the regional sphere increase transaction and coordination costs.

The study also highlights some limitations that open up interesting areas for possible lines of research. The first limitation refers to the dependent variable that has been used. The study uses the return on sales (ROS) margin. Although this financial measure captures the company's general performance, other measures could be used in the future, such as survival or economic profitability (ROA).

Although our work, in line with the most recent literature, has considered three regions to study the degree of geographical diversification, there is obviously a wide variety of countries worldwide, each with their own particular characteristics. Future studies could also include data per country to generalise the results.

Future works could also consider de-internationalization stages. Some scholars suggest viewing cross-border activity as a process between internationalization and de-internationalization (Benito and Welch, 1997; Calof and Beamish, 1995; Turcan, 2003; Welch and Luostarinen, 1988). As markets become less attractive, the company may decide to leave these markets and focuses efforts on more profitable markets where the volume of exports is intensified.

Identifying the effects of the international diversification of agri-food firms on their performance also entails several theoretical and managerial implications. It is crucial for the directors of the companies in the industry to understand the three phases of the internationalization process we have presented here, and for them to pay special attention to the two phases in which performance is low. The first is related to the initial costs of the internationalization process and the lack of dimension to cover the profitability threshold. The second is related to the costs associated with adapting to very different cultural and institutional environments and to the major barriers companies in the sector are confronted with when they enter new markets.

Furthermore, the results presented here could be interesting for policymakers designing and implementing export programmes for agri-food firms. Policies should include aid at the start of the internationalization process and try to prolong the internationalization strategy until the volume of business suffices to start showing an increase in performance. They should also prepare companies for the low performance in the third internationalization phase. The policies could possibly promote networking between Spanish and foreign companies to reduce the costs of more global internationalization strategies.

References

- Acedo, F. J., & Jones, M. V. (2007). Speed of internationalization and entrepreneurial cognition: Insights and a comparison between international new ventures, exporters and domestic firms. *Journal of World Business*, 42(3), 236-252.
- Almodóvar, P. (2012). The International performance of standardizing and customizing Spanish firms. The M curve relationships. *Multinational Business Review*, 20 (4), 306-330.

- Almodóvar, P., & Rugman, A. M. (2014). The M curve and the performance of Spanish international new ventures. *British Journal of Management*, 25(S1), S6-S23.
- Altomonte, C., & Nicolini, M. (2012). Economic integration and the dynamics of firms' competitive behavior. *Structural Change and Economic Dynamics*, 23(4), 383-402.
- Anderson, R. C., & Reeb, D. M. (2003). Founding-family ownership and firm performance: evidence from the S&P 500. *The journal of finance*, 58(3), 1301-1327.
- Annavarjula, M., & Beldona, S. (2000). Multinationality–performance relationship: A review and reconceptualization. *International Journal of Organizational Analysis*, 8(1): 48–67.
- Autio, E., Sapienza, H. J., & Almeida, J. G. (2000). Effects of time to internationalization, knowledge intensity, and imitability on growth. *Academy of Management Journal*, 43: 909–924.
- Bartlett, C., & Ghoshal, S. (1989). *Managing across borders: The transnational solution*. Boston, MA: Harvard University Press.
- Becker, P. H., & O. Egger. (2007). Endogenous Product versus Process Innovation and a Firm's Propensity to Export. Center for Economic Studies and Ifo Institute for Economic Research (CESIFO), Working Paper Series 1906, Munich (Germany).
- Beleska-Spasova, E. (2014). Determinants and measures of export performance – comprehensive literature review. *Journal of Contemporary Economic and Business Issues*, 1 (1). pp. 63-74.
- Benito, G. & Welch, L.S. (1997). Deinternationalisation, *Management International Review*, 37,2,7-25.
- Buckley, P. J. (1988). The limits of explanation: Testing the internalization theory. *Journal of International Business Studies*, 19(2): 181–194.
- Buckley, P. J., & Casson, M. C. (1976). *The future of the multinational enterprise*. London: Homes and Meier.
- Calof, J.L, Beamish, P.W. (1995). Adapting to Foreign Markets: Explaining Internationalisation, *International Business Review*, 4, 2, 115-131.
- Casson, M. (1986). International Divestment and Restructuring Decisions: With Special Reference to the Motor Industry. International Labour Organization, working paper No.40.

- Caves, R. (1971). International corporations: Industrial economics of foreign investment. *Economica*, 38: 1–27.
- Caves, R. (1996). *Multinational enterprise and economic analysis* (2nd ed.). Cambridge, MA: Harvard University Press.
- Caves, R. E. (1981). Intra-industry trade and market structure in the industrial countries. *Oxford Economic Papers*, 203-223.
- Chen, S., Tan, H. (2012). Region effects in the internationalization–performance relationship in Chinese firms. *Journal of World Business*, 47, 73-80.
- Chiao, Y-C., Yang, K-P, & Yu, C-M. J. (2006). Performance, Internationalization, and Firm-Specific Advantages of SMEs in a Newly-Industrialized Economy. *Small Business Economics*, Vol. 26, pp. 475-492.
- Clar, E., Pinilla, V., & Serrano, R. (2014). El comercio agroalimentario español en la segunda globalización, 1951-2011 (No. 1414). Asociación Española de Historia Económica. Working paper.
- Contractor, F. (2007). Is international business good for companies? The evolutionary or multi-stage theory of internationalization vs. the transaction cost perspective. *Management International Review*, 47: 453–475.
- Contractor, F. J., Kumar, V., & Kundu, S. K. (2007). Nature of the relationship between international expansion and performance: The case of emerging market firms. *Journal of World Business*, Vol. 42, pp. 401-417.
- Contractor, F. J., Kundu, S. K., & Hsu, C. C. (2003). A three-stage theory of international expansion: The link between multinationality and performance in the service sector. *Journal of International Business Studies*, 34(1): 5–19.
- Contreras Castillo, J. M., & Bacaria Colom, J. (2000). An evaluation of impacts on agricultural trade in Spain after EU integration. *Revista Española de Estudios Agrosociales y Pesqueros*, (187), 63-86.
- de Frahan, B. H., & Vancauteren, M. (2006). Harmonisation of food regulations and trade in the Single Market: evidence from disaggregated data. *European Review of Agricultural Economics*, 33(3), 337-360.

- Delios, A., & Beamish, P. W. (1999). Geographic scope, product diversification and the corporate performance of Japanese firms. *Strategic Management Journal*, 20: 711–727.
- Dunning, J. H. (1976). Trade, location of economic activity and the MNE: A search for an eclectic approach (pp. pp-395). University of Reading, Department of Economics.
- Fernández, M., Díez Vial, I. (in press), Internationalization pathways and the performance of SMEs, *European Journal of Marketing*, in press
- Fernández-Olmos, M. (2011). The determinants of internationalization: evidence from the wine industry. *Applied Economic Perspectives and Policy*, 33 (3), 384-401.
- Fundación, S. E. P. I. (2014). Encuesta sobre Estrategias Empresariales (ESEE).
- Grant, R. M. (1987). Multinationality and performance among British manufacturing companies. *Journal of International Business Studies*, 18(1): 79–89.
- Grant, R. M., Jammine, A. P., & Thomas, H. (1988). Diversity, diversification and profitability among British manufacturing companies 1972–1984. *Academy of Management Journal*, 31: 771–801.
- Greene, W. H., (2000). *Econometric Analysis*, 4th. Edit. Prentice Hall International. London.
- Haspeslagh, P. C.; Jemison, D. B. (1991). *Managing acquisitions: Creating value through corporate renewal*. New York: Free Press.
- Hitt, M.A., Hoskisson, R.E. & Kim, H. (1997). International diversification: effects on innovation and firm performance in product-diversified firms. *Academy of Management Journal*, Vol. 40 No. 4, pp. 767-98.
- Hofstede, G. (1980). *Culture's consequences: International difference in work-related values*. Beverly Hills, CA: Sage.
- Hoskisson, R., & Turk, T. (1990). Corporate restructuring: Governance and control limits of the internal market. *Academy of Management Review*, 15: 459–477.
- Hsu, W-T., Chen, H-L. & Cheng, C-Y. (2013), Internationalization and firm performance of SMEs: the moderating effects of CEO attributes. *Journal of World Business*, Vol. 48, pp. 1-12.
- <http://www.fundacionsepi.es/esee/sp/spresentacion.asp>

- Johanson, J. & Vahlne, J.E. (1977). The internationalization process of the firm- A model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, Vol. 8, pp.23-32
- Kirca, A., Roth, K., Hult, G., Cavusgil, S. (2012). The role of context in the multinationality-performance relationship: a meta-analytic review. *Global Strategy Journal*, 2, 108-121.
- Li, L. (2005). Is regional strategy more effective than global strategy in the US service industries? *Management International Review*, 1: 37–57 [Special issue].
- Lu, J. & Beamish, PW. (2004). International diversification and firm performance: the S-curve hypothesis. *Academy of Management Journal*, Vol.47 No.4, pp. 598–609.
- Majocchi, A., Bacchiocchi, E., & Mayrhofer, U. (2005). Firm size, business experience and export intensity in SMEs: A longitudinal approach to complex relationships. *International Business Review*, 14(6), 719-738.
- Pangarkar, N. (2008). Internationalization and performance of small-and medium-sized enterprises. *Journal of World Business*, 43(4), 475-485.
- Powell, K.S. (2014). From M–P to MA–P: Multinationality alignment and performance. *Journal of International Business Studies*, 45, 211-226.
- Qian, G., Khoury, T. A., Peng, M. W., & Qian, Z. (2010). The performance implications of intra-and inter-regional geographic diversification. *Strategic Management Journal*, 31(9), 1018-1030.
- Richter, N. (2007). Intra-regional sales and the internationalization and performance relationship. *Research in global strategic management*, 13, 359-381.
- Rosenzweig, P., & Singh, J. (1991). Organizational environments and the multinational enterprise. *Academy of Management Review*, 16: 340–361.
- Rugman, A. M., & Oh, C. H. (2010). Does the regional nature of multinationals affect the multinationality and performance relationship? *International Business Review*, 19(5), 479-488.
- Ruigrok, W., & Wagner, H. (2005). Internationalization and Firm Performance: Meta-analytic review and future research directions. Paper presented at the Academy of International Business Conference, 2005.

- Sapienza, HJ., Autio E., George, G. & Zahra, S. (2006). A capabilities perspective on the effects of early internationalization on firm survival and growth. *Academy of Management Review*, Vol. 31 No.4, pp. 914–933.
- Serrano, R., & Pinilla, V. (2011). Agricultural and food trade in European Union countries, 1963-2000: a gravity equation approach. *Economies et Sociétés (Serie 'Histoire Economique Quantitative')*, 191-229.
- Serrano, R., & Pinilla, V. (2014). Changes in the Structure of World Trade in the Agri-Food Industry: The Impact of the Home Market Effect and Regional Liberalization From a Long-Term Perspective, 1963–2010. *Agribusiness*, 30(2), 165-183.
- Sundaram, A. K., & Black, J. S. (1992). The environment and internal organization of multinational enterprises. *Academy of Management Review*, 17(4), 729-757.
- Turcan, R. V. (2003). De-internationalisation and the Small Firm, in C. Wheeler, F. McDonald and I. Greaves (eds.), *Internationalisation: Firm Strategies and Management*, Great Britain: Palgrave, 208-222.
- UN-COMTRADE, (2014). UN Commodity Trade Statistics Database. Statistical Division of the United Nations. New York.- <http://comtrade.un.org/db/>
- Wagner, J. (2012). International trade and firm performance: a survey of empirical studies since 2006. *Review of World Economics*, 148(2), 235-267.
- Welch, L. and Luostarinen, R. (1988). Internationalisation: Evolution of a Concept. *Journal of General Management*, 14(2), 34-55.
- Wooldridge, J. M. (2001). Diagnostic testing. *A Companion to Theoretical Econometrics*, 180-200.
- Zahra, S. A. & George, G. (2002), Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, Vol. 27 No.2, pp.185-203.
- Zou, S., Stan, S. (1998). The determinants of export performance: A review of the empirical literature between 1987 and 1997. *International Marketing Review*, 15 (5), 333–356.

DOCUMENTOS DE TRABAJO
Facultad de Economía y Empresa
Universidad de Zaragoza
Depósito Legal Z-1411-2010. ISSN 2171-6668

2002-01: “Evolution of Spanish Urban Structure During the Twentieth Century”. Luis Lanaspá, Fernando Pueyo y Fernando Sanz. Department of Economic Analysis, University of Zaragoza.

2002-02: “Una Nueva Perspectiva en la Medición del Capital Humano”. Gregorio Giménez y Blanca Simón. Departamento de Estructura, Historia Económica y Economía Pública, Universidad de Zaragoza.

2002-03: “A Practical Evaluation of Employee Productivity Using a Professional Data Base”. Raquel Ortega. Department of Business, University of Zaragoza.

2002-04: “La Información Financiera de las Entidades No Lucrativas: Una Perspectiva Internacional”. Isabel Brusca y Caridad Martí. Departamento de Contabilidad y Finanzas, Universidad de Zaragoza.

2003-01: “Las Opciones Reales y su Influencia en la Valoración de Empresas”. Manuel Espitia y Gema Pastor. Departamento de Economía y Dirección de Empresas, Universidad de Zaragoza.

2003-02: “The Valuation of Earnings Components by the Capital Markets. An International Comparison”. Susana Callao, Beatriz Cuellar, José Ignacio Jarne and José Antonio Laínez. Department of Accounting and Finance, University of Zaragoza.

2003-03: “Selection of the Informative Base in ARMA-GARCH Models”. Laura Muñoz, Pilar Olave and Manuel Salvador. Department of Statistics Methods, University of Zaragoza.

2003-04: “Structural Change and Productive Blocks in the Spanish Economy: An Input-Output Analysis for 1980-1994”. Julio Sánchez Chóliz and Rosa Duarte. Department of Economic Analysis, University of Zaragoza.

2003-05: “Automatic Monitoring and Intervention in Linear Gaussian State-Space Models: A Bayesian Approach”. Manuel Salvador and Pilar Gargallo. Department of Statistics Methods, University of Zaragoza.

2003-06: “An Application of the Data Envelopment Analysis Methodology in the Performance Assessment of the Zaragoza University Departments”. Emilio Martín. Department of Accounting and Finance, University of Zaragoza.

2003-07: “Harmonisation at the European Union: a difficult but needed task”. Ana Yetano Sánchez. Department of Accounting and Finance, University of Zaragoza.

2003-08: “The investment activity of spanish firms with tangible and intangible assets”. Manuel Espitia and Gema Pastor. Department of Business, University of Zaragoza.

2004-01: “Persistencia en la performance de los fondos de inversión españoles de renta variable nacional (1994-2002)”. Luis Ferruz y María S. Vargas. Departamento de Contabilidad y Finanzas, Universidad de Zaragoza.

2004-02: “Calidad institucional y factores político-culturales: un panorama internacional por niveles de renta”. José Aixalá, Gema Fabro y Blanca Simón. Departamento de Estructura, Historia Económica y Economía Pública, Universidad de Zaragoza.

2004-03: “La utilización de las nuevas tecnologías en la contratación pública”. José M^a Gimeno Feliú. Departamento de Derecho Público, Universidad de Zaragoza.

2004-04: “Valoración económica y financiera de los trasvases previstos en el Plan Hidrológico Nacional español”. Pedro Arrojo Agudo. Departamento de Análisis Económico, Universidad de Zaragoza. Laura Sánchez Gallardo. Fundación Nueva Cultura del Agua.

2004-05: “Impacto de las tecnologías de la información en la productividad de las empresas españolas”. Carmen Galve Gorriz y Ana Gargallo Castel. Departamento de Economía y Dirección de Empresas. Universidad de Zaragoza.

2004-06: “National and International Income Dispersion and Aggregate Expenditures”. Carmen Fillat. Department of Applied Economics and Economic History, University of Zaragoza. Joseph Francois. Tinbergen Institute Rotterdam and Center for Economic Policy Research-CEPR.

2004-07: “Targeted Advertising with Vertically Differentiated Products”. Lola Esteban and José M. Hernández. Department of Economic Analysis. University of Zaragoza.

2004-08: “Returns to education and to experience within the EU: are there differences between wage earners and the self-employed?”. Inmaculada García Mainar. Department of Economic Analysis. University of Zaragoza. Víctor M. Montuenga Gómez. Department of Business. University of La Rioja

2005-01: “E-government and the transformation of public administrations in EU countries: Beyond NPM or just a second wave of reforms?”. Lourdes Torres, Vicente Pina and Sonia Royo. Department of Accounting and Finance. University of Zaragoza

2005-02: “Externalidades tecnológicas internacionales y productividad de la manufactura: un análisis sectorial”. Carmen López Pueyo, Jaime Sanau y Sara Barcenilla. Departamento de Economía Aplicada. Universidad de Zaragoza.

2005-03: “Detecting Determinism Using Recurrence Quantification Analysis: Three Test Procedures”. María Teresa Aparicio, Eduardo Fernández Pozo and Dulce Saura. Department of Economic Analysis. University of Zaragoza.

2005-04: “Evaluating Organizational Design Through Efficiency Values: An Application To The Spanish First Division Soccer Teams”. Manuel Espitia Escuer and Lucía Isabel García Cebrián. Department of Business. University of Zaragoza.

2005-05: “From Locational Fundamentals to Increasing Returns: The Spatial Concentration of Population in Spain, 1787-2000”. María Isabel Ayuda. Department of Economic Analysis. University of Zaragoza. Fernando Collantes and Vicente Pinilla. Department of Applied Economics and Economic History. University of Zaragoza.

2005-06: “Model selection strategies in a spatial context”. Jesús Mur and Ana Angulo. Department of Economic Analysis. University of Zaragoza.

2005-07: “Conciertos educativos y selección académica y social del alumnado”. María Jesús Mancebón Torrubia. Departamento de Estructura e Historia Económica y Economía Pública. Universidad de Zaragoza. Domingo Pérez Ximénez de Embún. Departamento de Análisis Económico. Universidad de Zaragoza.

2005-08: “Product differentiation in a mixed duopoly”. Agustín Gil. Department of Economic Analysis. University of Zaragoza.

2005-09: “Migration dynamics, growth and convergence”. Gemma Larramona and Marcos Sanso. Department of Economic Analysis. University of Zaragoza.

2005-10: “Endogenous longevity, biological deterioration and economic growth”. Marcos Sanso and Rosa María Aísa. Department of Economic Analysis. University of Zaragoza.

2006-01: “Good or bad? - The influence of FDI on output growth. An industry-level analysis“. Carmen Fillat Castejón. Department of Applied Economics and Economic History. University of Zaragoza. Julia Woerz. The Vienna Institute for International Economic Studies and Tinbergen Institute, Erasmus University Rotterdam.

2006-02: “Performance and capital structure of privatized firms in the European Union”. Patricia Bachiller y M^a José Arcas. Departamento de Contabilidad y Finanzas. Universidad de Zaragoza.

2006-03: “Factors explaining the rating of Microfinance Institutions”. Begoña Gutiérrez Nieto and Carlos Serrano Cinca. Department of Accounting and Finance. University of Saragossa, Spain.

2006-04: “Libertad económica y convergencia en argentina: 1875-2000”. Isabel Sanz Villarroya. Departamento de Estructura, Historia Económica y Economía Pública. Universidad de Zaragoza. Leandro Prados de la Escosura. Departamento de H^a e Instituciones Ec. Universidad Carlos III de Madrid.

2006-05: “How Satisfied are Spouses with their Leisure Time? Evidence from Europe*”. Inmaculada García, José Alberto Molina y María Navarro. University of Zaragoza.

2006-06: “Una estimación macroeconómica de los determinantes salariales en España (1980-2000)”. José Aixalá Pastó y Carmen Pelet Redón. Departamento de Estructura, Historia Económica y Economía Pública. Universidad de Zaragoza.

2006-07: “Causes of World Trade Growth in Agricultural and Food Products, 1951 – 2000”. Raúl Serrano and Vicente Pinilla. Department of Applied Economics and Economic History, University of Zaragoza, Gran Via 4, 50005 Zaragoza (Spain).

2006-08: “Prioritisation of patients on waiting lists: a community workshop approach”. Angelina Lázaro Alquézar. Facultad de Derecho, Facultad de Económicas. University of Zaragoza. Zaragoza, Spain. Begoña Álvarez-Farizo. C.I.T.A.- Unidad de Economía. Zaragoza, Spain

2007-01: “Determinantes del comportamiento variado del consumidor en el escenario de Compra”. Carmen Berné Manero y Noemí Martínez Caraballo. Departamento de Economía y Dirección de Empresas. Universidad de Zaragoza.

2007-02: “Alternative measures for trade restrictiveness. A gravity approach”. Carmen Fillat & Eva Pardos. University of Zaragoza.

2007-03: “Entrepreneurship, Management Services and Economic Growth”. Vicente Salas Fumás & J. Javier Sánchez Asín. Departamento de Economía y Dirección de Empresas. University of Zaragoza.

2007-04: “Equality versus Equity based pay systems and their effects on rational altruism motivation in teams: Wicked masked altruism”. Javier García Bernal & Marisa Ramírez Alerón. University of Zaragoza.

2007-05: “Macroeconomic outcomes and the relative position of Argentina’s Economy: 1875-2000”. Isabel Sanz Villarroja. University of Zaragoza.

2008-01: “Vertical product differentiation with subcontracting”. Joaquín Andaluz Funcia. University of Zaragoza.

2008-02: “The motherwood wage penalty in a mediterranean country: The case of Spain” Jose Alberto Molina Chueca & Victor Manuel Montuenga Gómez. University of Zaragoza.

2008-03: “Factors influencing e-disclosure in local public administrations”. Carlos Serrano Cinca, Mar Rueda Tomás & Pilar Portillo Tarragona. Departamento de Contabilidad y Finanzas. Universidad de Zaragoza.

2008-04: “La evaluación de la producción científica: hacia un factor de impacto neutral”. José María Gómez-Sancho y María Jesús Mancebón-Torrubia. Universidad de Zaragoza.

2008-05: “The single monetary policy and domestic macro-fundamentals: Evidence from Spain”. Michael G. Arghyrou, Cardiff Business School and Maria Dolores Gadea, University of Zaragoza.

2008-06: “Trade through fdi: investing in services”. Carmen Fillat-Castejón, University of Zaragoza, Spain; Joseph F. Francois. University of Linz, Austria; and CEPR, London & Julia Woerz, The Vienna Institute for International Economic Studies, Austria.

2008-07: “Teoría de crecimiento semi-endógeno vs Teoría de crecimiento completamente endógeno: una valoración sectorial”. Sara Barcenilla Visús, Carmen López Pueyo, Jaime Sanaú. Universidad de Zaragoza.

2008-08: “Beating fiscal dominance. The case of Spain, 1874-1998”. M. D. Gadea, M. Sabaté & R. Escario. University of Zaragoza.

2009-01: “Detecting Intentional Herding: What lies beneath intraday data in the Spanish stock market” Blasco, Natividad, Ferreruela, Sandra (Department of Accounting and Finance. University of Zaragoza. Spain); Corredor, Pilar (Department of Business Administration. Public University of Navarre, Spain).

2009-02: “What is driving the increasing presence of citizen participation initiatives?”. Ana Yetano, Sonia Royo & Basilio Acerete. Departamento de Contabilidad y Finanzas. Universidad de Zaragoza.

2009-03: “Estilos de vida y “reflexividad” en el estudio del consumo: algunas propuestas”. Pablo García Ruiz. Departamento de Psicología y Sociología. Universidad de Zaragoza.

2009-04: “Sources of Productivity Growth and Convergence in ICT Industries: An Intertemporal Non-parametric Frontier Approach”. Carmen López-Pueyo and M^a Jesús Mancebón Torrubia. Universidad de Zaragoza.

2009-05: “Análisis de los efectos medioambientales en una economía regional: una aplicación para la economía aragonesa”. Mónica Flores García y Alfredo J. Mainar Causapé. Departamento de Economía y Dirección de Empresas. Universidad de Zaragoza.

2009-06: “The relationship between trade openness and public expenditure. The Spanish case, 1960-2000”. M^a Dolores Gadea, Marcela Sabate y Estela Saenz. Department of Applied Economics. School of Economics. University of Economics.

2009-07: “Government solvency or just pseudo-sustainability? A long-run multicointegration approach for Spain”. Regina Escario, María Dolores Gadea, Marcela Sabaté. Applied Economics Department. University of Zaragoza.

2010-01: “Una nueva aproximación a la medición de la producción científica en revistas JCR y su aplicación a las universidades públicas españolas”. José María Gómez-Sancho, María Jesús Mancebón Torrubia. Universidad de Zaragoza

2010-02: “Unemployment and Time Use: Evidence from the Spanish Time Use Survey”. José Ignacio Gimenez-Nadal, University of Zaragoza, José Alberto Molina, University of Zaragoza and IZA, Raquel Ortega, University of Zaragoza.

2011-01: “Universidad y Desarrollo sostenible. Análisis de la rendición de cuentas de las universidades del G9 desde un enfoque de responsabilidad social”. Dr. José Mariano Moneva y Dr. Emilio Martín Vallespín, Universidad de Zaragoza.

2011-02: “Análisis Municipal de los Determinantes de la Deforestación en Bolivia.” Javier Aliaga Lordeman, Horacio Villegas Quino, Daniel Leguía (Instituto de Investigaciones Socio-Económicas. Universidad Católica Boliviana), y Jesús Mur (Departamento de Análisis Económico. Universidad de Zaragoza)

2011-03: “Imitations, economic activity and welfare”. Gregorio Giménez. Facultad de Ciencias Económicas y Empresariales. Universidad de Zaragoza.

2012-01: “Selection Criteria for Overlapping Binary Models”. M. T Aparicio and I. Villanúa. Department of Economic Analysis, Faculty of Economics, University of Zaragoza

2012-02: “Sociedad cooperativa y socio cooperativo: propuesta de sus funciones objetivo”. Carmen Marcuello y Pablo Nachar-Calderón. Universidad de Zaragoza

2012-03: “Is there an environmental Kuznets curve for water use? A panel smooth transition regression approach”. Rosa Duarte (Department of Economic Analysis), Vicente Pinilla (Department of Applied Economics and Economic History) and Ana Serrano (Department of Economic Analysis). Faculty of Economics and Business Studies, Universidad de Zaragoza

2012-04: “Análisis Coste-Beneficio de la introducción de dispositivos ahorradores de agua. Estudio de un caso en el sector hotelero”. Barberán Ramón, Egea Pilar, Gracia-de-Rentería Pilar y Manuel Salvador. Facultad de Economía y Empresa. Universidad de Zaragoza.

2013-01: “The efficiency of Spanish mutual funds companies: A slacks – based measure approach”. Carlos Sánchez González, José Luis Sarto and Luis Vicente. Department of Accounting and Finance. Faculty of Economics and Business Studies, University of Zaragoza.

2013-02: “New directions of trade for the agri-food industry: a disaggregated approach for different income countries, 1963-2000”. Raúl Serrano (Department of Business Administration) and Vicente Pinilla (Department of Applied Economics and Economic History). Universidad de Zaragoza.

2013-03: “Socio-demographic determinants of planning suicide and marijuana use among youths: are these patterns of behavior causally related?”. Rosa Duarte, José Julián Escario and José Alberto Molina. Department of Economic Analysis, Universidad de Zaragoza.

2014-01: “Análisis del comportamiento imitador intradía en el mercado de valores español durante el periodo de crisis 2008-2009”. Alicia Marín Solano y Sandra Ferreruela Garcés. Facultad de Economía y Empresa, Universidad de Zaragoza.

2015-01: “International diversification and performance in agri-food firms”. Raúl Serrano, Marta Fernández-Olmos and Vicente Pinilla. Facultad de Economía y Empresa, Universidad de Zaragoza.