Management Quality and Firm Heterogeneity in International Trade

Javier Serrano and Rafael Myro

Abstract

This paper analyses the impact of Management Quality on the firm internationalization process, in a context of heterogeneous firms. This work tries to reconcile the recent International Trade literature, focused on the role of firm heterogeneity in international markets, with the business management literature, in order to study the role of management quality on the firm's economic performance. Using a survey of Spanish manufacturing firms, we construct a Management Quality Index (MQI), serving as a proxy of the good management practices in the firm. The results show that there exists a management quality bonus on exporters, and the difference between exporters and non-exporters is higher in terms of management quality than in terms of productivity. In addition, a change in firm's management quality has a deeper impact on the export decision than a change in firm's productivity. Finally, all these results are also extensible to explaining differences between multinationals (firms involved in foreign direct investment) and non-multinationals, as well as to explain the firm's decision to invest abroad.

Javier Serrano
Department of Applied Economics II
Faculty of Economics
Complutense University of Madrid
Campus de Somosaguas, 28223, Pozuelo de Alarcón, Madrid, Spain
E-mail address: javise01@ucm.es
Tel.: +34 606 22 83 10

Rafael Myro
Department of Applied Economics II
Faculty of Economics
Complutense University of Madrid
Campus de Somosaguas, 28223, Pozuelo de Alarcón, Madrid, Spain
E-mail address: rmyrosan@ucm.es
Tel.: +34 91 394 24 76
Fax: 91 394 24 57

1- Introduction

Recent International Trade literature has been primarily focused on the role of firm heterogeneity in international markets. Thanks to the increasing availability of data at the firm level, research has revealed the existence of substantial differences between exporters and non-exporters. Therefore, according to Bernard and Jensen (1995), exporting firms are larger, more innovative and more productive than non-exporting firms. Among all these differences, productivity has been placed at the core of the firm export decision. In his seminal work, Melitz (2003) established that only most productive firms could obtain positive profits from exports, due to the existence of certain sunk costs in the entry to international markets. Consequently, only most productive firms will enter the export markets while less productive firms will stay in the domestic market.

Nevertheless, what Melitz (2003) proposed in his model does not correspond exactly to the "real world". Figure 1 shows the productivity distribution of Spanish firms in the manufacturing sector from 2009 to 2013. The red line represents the average productivity level of non-exporters. As it can be seen, a large number of firms are regularly exporting with even less productivity than non-exporters. How is this situation possible? Are exporting firms showing negative profits every year? Nothing is further from the truth, though. In fact, Spanish exports are living a veritable growth spurt from the beginning of the recession in 2008, growing at an average annual rate of 4,5% (Myro, 2015).

Figure1: Firms Productivity Distribution
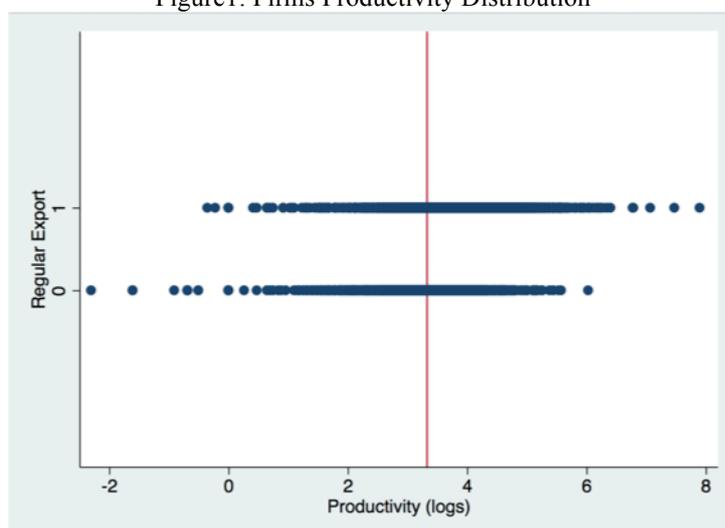
Source: Own elaboration from the ESEE.

According to Melitz's model (2003), the only reason for which firms decide to enter the domestic market is the existence of future profit expectations, knowing that the average level of firm benefits in the market is positive. Before entering the domestic market, firms ignore their productivity level, and once they enter the market, their productivity is revealed. In the domestic market, new entrants will have, on average, lower productivity levels and a higher failure probability than firms that already were in the market. This same situation appears in export markets. Firms that were in risk when they entered the domestic market will also risk entering the export markets, regardless of their productivity level. Even though these firms may obtain negative profits in the short term, due to the existence of sunk costs, they know that "firms entering export markets grow substantially faster in employment and output than non-exporters" (Bernard et al., 2007) and that "exporters firms raise their profits and their market shares after having started exporting" (Melitz, 2003). These firms hope their productivity will rise while exporting (learning by exporting), which will allow them to reach positive profits in a medium term.

In any case, productivity is still an important element of the internationalization process of a firm, determining firm's efficiency and its capacity to be competitive in international markets. However, as data showed, many firms are able to overcome their limitations in terms of productivity and, through an ambitious internationalization strategy, they achieve to export with remarkable success. Thus, the key element to determine the export condition of the firm could not be productivity, but the courage and the ambition of the firm, in other words, business management quality.

Until now, research has shown that the firm's internationalization decision is tightly connected to firm's size (Bernard et al., 2003), innovation (Guarascio et al. 2016) and productivity (Helpman et al., 2004). However, all these elements respond to a wide concept in the firm: the management quality. The aim of this paper is, thereby, to study the impact of the management quality on the firm's internalization decision. We are conscious that the fact of measuring management quality is an undeniable difficult task, but we are not the first to do it (Bloom and Van Reenen, 2007) and our indicator of management quality has proved to be extremely robust.

Using our Management Quality Index (MQI) as a proxy of the good management practices in a firm, we will show that i) there exists a management quality bonus on exporters, as well as a productivity bonus, ii) the size of the management quality bonus is greater than the size of the productivity bonus, in other words, the difference between exporters and non-exporters is greater in terms of management quality than in terms of productivity, iii) it is more determinant, regarding the export decision of the firm, to reach a minimum level of management quality (a management quality threshold) than a minimum level of productivity, iv) a change in firm's management quality has a deeper impact on the export decision than a change in firm's productivity, v) all these results are also extensible to explain differences between multinationals (firms involved in foreign direct investment) and non-multinationals, as well as to explain the firm's decision to invest abroad.

The rest of the paper is organized as follows. Section 2 analyses the theoretical framework that supports this research, reconciling both recent International Trade literature, focused on explaining the firm's behaviour on international markets, as well as the management literature, focused on evaluating the impact of management practices on the firm's economic performance. Section 3 describes the dataset and the methodology used in this research, as well as the econometric strategy employed to demonstrate our objectives. Section 4 presents the main results obtained from the econometric analysis, with the corresponding robustness checks. Finally, Section 5 is dedicated to standing out the main conclusions of this research and to offer some implications of public policy.

2- Theoretical framework

In the mid 90's, the increasing availability of data at the firm level showed that the Classical Models of International Trade (Ricardo, 1817; Heckscher, 1919; Ohlin, 1933) as well as the New Trade Theory (Krugman, 1980; Helpman, 1984; Krugman and Helpman, 1985) had serious limitations in explaining the behaviour of individual firms in the international markets. Even though these Trade Models incorporated appropriate elements to describe some stylized facts of International Trade (comparative advantages, specialization, imperfect competition, economies of scale), "they proved inadequate to explain a range of empirical findings that emerged in the 90's from new firm level datasets" (Helpman, 2011).

The first who empirically studied the heterogeneity across firms between industries were Bernard and Jensen (1995). Thanks to a panel data of US manufacturing firms between 1976 and 1987, they find remarkable differences between exporter and domestic firms. Specifically, they discovered that exporters were larger, more capital intensive, paid higher wages, had higher benefits, invested more per employee and showed higher labour productivity than non-exporters firms. However, the theoretical model that recognized differences among individual producers within an industry didn't arrive until Bernard et al. (2003) and Melitz (2003) broke with the classical assumption of a representative firm to incorporate firm heterogeneity in markets.

In his model, Melitz (2003) made an extension of the Krugman (1980) model with monopolistic competition and increasing returns to scale but incorporating firm level productivity differences. In the Melitz's model, the key element to explain why some firms export while some others do not is productivity. According to him, some sunk costs associated with the entry in exports markets exist and only the most productive firms are able to overcome these costs. In that sense, the least productive firms serve only the domestic market while the most productive firms can export to international markets.

Helpman et al. (2004) extended the Melitz's (2003) model to include also firms that invest abroad. Their results showed that multinational firms, those firms who own foreign subsidiaries or license foreign firms to produce their products, are more productive than the rest of firms (exporters and domestic firms). In other words, only the most productive firms are able to get involved in foreign direct investment. The hierarchy of firms in terms of productivity presented by Melitz (2003) is extended in the

Helpman et al.'s model: the least productive firms serve only the domestic market, firms with an intermediate productivity export, and only the most productive firms are able to involve in FDI activities.

Regarding the empirical literature about FDI at the firm level, Yeaple (2009), with a sample of U.S. multinational firms, found that most productive multinational firms invest in a larger number of foreign countries. He also found that multinational activity is related to other aspects such as distance between the parent company and the subsidiary, a common language or the GDP per capita of the country in which the subsidiary will operate. Moreover, the activity of multinational firms has been linked to the contract enforcement between the parent firm and the subsidiary (Antràs, 2014) or the institutional distance (Cezar et al. 2015).

However, it is important to remind that Melitz, Helpman or Bernard were not the first authors to investigate the behaviour of individual firms in international markets. In fact, Johanson and Wiedersheim_Paul (1975) and Johanson and Vahlne (1977) proposed a model that described the behaviour of multinational firms, later called the Uppsala Model. Through the study of the cases of four Sweden multinational firms, they concluded that firms experienced a process of gradual internationalization in their conquest of international markets, a process they called "The Establishment Chain" (first selling only in the domestic market, then exporting to neighbouring countries, and finally getting involved in FDI activities).

Regarding the empirical literature for Spain, research has focused on verifying wether the behaviour of Spanish firms fitted the one described in the theoretical models. Thus, Delgado et al. (2002), using the same dataset than in this paper, measured the differences in Total Factor Productivity between exporting and non-exporting firms. They concluded that Spanish exporting firms showed higher levels of productivity than non-exporting firms. They also verified the hypothesis of self-selection, presented by Melitz (2003), of more productive firms in the export markets. Using another dataset, Mainer (2014) estimated that Spanish multinationals and Spanish exporters were 42% and 33% more productive, respectively, than Spanish domestic firms.

Fariñas et al. (2007) found that Spanish exporters were not only more productive, but also greater, paid higher wages and were more innovative than Spanish non-exporters. In this line, Mañez et al. (2015) established a relation between productivity, R&D and exports at the firm level. According to them, having invested in R&D in the past has a positive and significant effect on the probability to get involved in exporting. More recently, Eppinger et al. (2015) analysed the behaviour of Spanish firms during the recent recession. They concluded that those firms that entered the crisis as exporters, and continued exporting, were more resilient to the crisis than domestic firms.

As explained, much of the recent literature in International Trade has focused on the role of productivity in explaining the behaviour of firms in international markets (Melitz, 2003; Grazzi et al., 2016). Nevertheless, both the theoretical and the empirical research have proved that the process of internationalization of the firm is not only related to productivity, but also to the firm size (Davies et al. 2015; Fariñas et al., 2007) and the innovation intensity (Guarascio et al., 2016). Moreover, empirical research has also discovered a narrow connection between productivity and the firm size (Bernard and Jensen, 1995, for U.S firms; Huerta and Salas, 2012 for Spanish firms) and between productivity and innovation (OECD, 2014). Indeed, productivity, innovation, size and internationalization could respond to a larger element at the core of the firm: the management quality (which of course would be pushed up by feed-backs from all of them).

Usually, the economic science has, somehow, marginalized the business management theory, precisely for considering it less scientific. The exception is Robert Lucas's model (1978) about the links between managerial "talent" and the size of firms[1]. Even though the business management theory may lack the mathematical foundation present in the economic theory, the empirical research about management topics should not be ignored. In this sense, recent literature in the field of business management has revealed that management practices, known as the attributes of the top managers together with the organizational structure, determine the firm's behaviour (Bloom and Van Reenen, 2007).

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[1] According to Lucas's model, the division of persons into managers and employees and the allocation of productive factors across managers could have a consequence on the size distribution of firms.

Bloom and Van Reenen (2007) created an index of management practices conducting a survey to 732 medium size manufacturing firms in Europe and U.S. Managers were asked about 3 topics: Monitoring (tracking and reviewing performance of workers), Targets (type, realism and transparency of targets) and Incentives (promotion criteria, pay, bonuses). They then focused on the relationship between their index of management practices and productivity. They concluded that 29% of the cross-country productivity gap between U.S. and other European countries could be accounted for by observed management differences. According to their results, the heterogeneity of management quality within countries is greater than across countries, due to the existence in every country of a long tail of extremely badly managed firms. In this sense, the differences between countries depend on the size of this "long tail" of bad managed firms.

The reasons behind the cross-country differences in terms of managerial quality are two: market competition and the number of family owned firms (Bloom and Van Reenen, 2013). Regarding market competition, in countries with less labour regulation and less trade barriers, poorly managed or unproductive firms will exit the market. In addition, efficiency improvements have a larger impact on shifting market shares (OECD, 2014). As a result, in U.S., one of the countries with less stringent regulations and where the market discipline is more accentuated, the reallocation of market shares is deeper and faster, and, consequently, efficient firms are able to become larger. This is the reason why the "long tail" of bad managed firms is smaller in U.S. than in other countries. In addition, competition across markets has been proved to be a source of firm productivity growth, through the change in the product mix within firm (Mayer et al. 2014).

Regarding the ownership of the firm, a strong relationship between the number of family firms (and also the number of public firms or firms in which the founder is the CEO) and the size of the tail of bad managed firms exists (Bloom and Van Reenen, 2010). Thus, family firms tend to be very badly managed because in this kind of firms, managers do not need to have any business formation or any previous experience. Compared to the U.S, family firms are more common in France or the U.K. due to "their Normand heritage in which *primo geniture* was legally enforced to preserve concentrated land-holdings for military support" (Bloom and Van Reenen, 2007).

Leaving aside the comparison between countries and focusing on the firm level, International Trade literature places multinationals on the top of the productivity hierarchy (Helpman et al. 2004). However, according to Bloom et al. (2009), this is because multinationals are generally well managed in every country. In fact, decentralization of power within firm, main feature of multinational companies, allows the cooperation between the parent firm and the affiliates, which, in turn, enables more efficient affiliates to grow in scale, improving aggregate productivity ultimately. More generally, this connection between management quality and productivity is established through the workforce's skill. In this sense, firms with higher management quality have higher average worker skills and pay higher wages to the employees (Bender et al. 2016).

Such is the importance of the management quality in the development of firm productivity, that it has been compared to a kind of technology (Bloom et al. 2013). In fact, management quality allows the creation and diffusion of technological innovation, which in turn fosters productivity. This narrow relationship between innovation and productivity is due to business management, which "enhances the ability of firms to undertake the internal reallocations required to implement new technologies and to sustain the innovation process" (OECD, 2014). In sum, the empirical literature focused on researching the role of management quality in the behaviour of firms has concluded that better managed firms are more productive, more innovative, more profitable, have a greater survival rate and grow faster (Bloom et al. 2013).

Regarding the empirical literature for Spain, research has focused on the relationship between management quality and the size of firms in a comparative framework with other countries. Huerta and Salas (2014) concluded that differences in the firm average size between OECD countries are due, in a greater extent, to "differences in organizational and internal management factors rather than differences in the functioning of product markets". Huerta and Salas (2012) assured that the firm heterogeneity in Spain, in terms of efficiency and innovation, has its roots in the heterogeneity of managers education that also affects size of firms. This line is followed by Pérez and Serrano (2012) and by Sebastian and Serrano (2011) who highlight the low level of formation of Spanish firm managers compared to other OECD countries. This low level of manager's formation is associated to smaller firms and self-employment

(Salas et al. 2014). On the contrary, higher educational levels of managers are associated to more competitive and larger firms.

The aim of this paper is, thus, to reconcile the two theories presented above: the theory of international trade focused on the role of firm heterogeneity in the international markets and the theory of management quality and its importance in explaining the behaviour of firms. Until now, literature has shown that the process of internationalization of the firm is narrowly related to productivity, firm size and innovation intensity. On the other hand, research about management quality has highlighted that the business management of the firm is tightly connected to productivity, firm size, and innovation. In this sense, in this paper we will focus on the relationship between the process of internationalization of the firm and the management quality.

3- Data and Methodology

3.1 Data

The data source used in this research is the Survey on Firms´ Strategies (EESE) drawn up by the Spanish Ministry of Industry and the *Fundación Empresa Pública*. This data set is an annual survey, which refers to a representative sample of Spanish manufacturing firms, according to industry and size. The Survey collects sampling information for firms with between 10 and 200 workers and exhaustive information for firms with 200 or more workers. The database, then, is biased towards large firms. The period analysed in this research is between 2009-2013 (5 years). Some firms answer every year while others do not, which makes the dataset an unbalanced panel. For our purposes, we will use three different samples in this research:

- The 1º sample is composed of two kind of firms: those that export in all the periods in which they answer to the survey (*Exporters*) and those that do not export in any period in which they answer to the survey (*Non Exporters*). In this sample we do not take into consideration whether firms invest abroad or not.

- The 2º sample is composed of two kind of firms: those that are involved in foreign direct investment (FDI) activities in all the periods in which they answer to the survey (*Multinationals),* and those that are not involved in FDI activities in any period in which they answer to the survey (*Non Multinationals*). In this sample we do not take into consideration whether firms export or not.

- The 3º sample is composed of three kind of firms: those that neither export nor do FDI in any period in which they answer to the survey (*Domestics*), those that export in every period but are not involved in FDI activities in any period in which they answer to the survey (*Only Exporters*), and those that export and are involved in FDI activities in every period in which they answer to the survey (*Multinational Exporters*).

Table 1 presents the summary of the sample. In every sample, we have controlled by firm industry and size. The activity of firms is classified into 20 different industries, according to the 3 digits aggregation CNAE-09 of manufacturing industries. The complete list of industries is presented in the Appendix 1. We have classified firm size into the following three categories: small (if the firm has less than 50 employees), medium (if the firm has between 51 and 200 employees) and large (if the firm has more than 201 employees).

Table 1: Sample description

1º Sample (Observations: 7.700)		
	Firms	%
Total	2.172	100
Non Exporters	704	32
Exporters	1468	68
2º Sample (Observations: 8.151)		
	Firms	%
Total	2.280	100
Non Multinationals	2.026	89
Multinationals	254	11
3º Sample (Observations: 7.263)		
	Firms	%
Total	2.075	100
Domestics	698	34
Only Exporters	1129	54
Multinational Exporters	248	12

3.2 Management Quality Index (MQI)

The Management Quality Index (MQI) has been elaborated following Campo Martínez, S., and Yagüe Guillén, M. J. "El Capital Directivo" in MYRO, R. (dir.): *Una nueva política para impulsar la industria y el empleo.* Consejo Económico y Social, cap. 6, mimeo. Using this same dataset, the Survey on Firms´ Strategies (EESE), they construct the IBPD (Good Management Practices Index), selecting 46 indicators in the survey (the complete list of indicators is presented in the Appendix 2), dividing them into 6 categories:

- *Leadership* (7 indicators): related to leadership and management abilities.
- *Innovation* (14 indicators): related to management operations of products, processes, or services.
- *Collaboration* (6 indicators): related to the management of partnerships and resources.
- *Employees* (7 indicators): related to the management of the staff.
- *Digitalization* (7 indicators): related to the digital and technological strategy.
- *Results* (5 indicators): related to the measurement of the results

All the indicators are binaries, in other words, when asked about the use of these indicators, the firm's only possible answers are yes or no. Every indicator is constructed as follow:

$$X_{it} = \begin{cases} 1, & \text{if firm } i \text{ in year } t \text{ perform the indicator X (it has answered "yes")} \\ 0, & \text{if firm } i \text{ in year } t \text{ do not perform the indicator X (it has answered "no")} \end{cases}$$

Where X is the value of the indicator, i is the firm and t is the year.

To construct each category, we add the value of each indicator in each category, and then, to build up the Management Quality Index (MQI), we add the values of each category. The MQI is thus reflecting the number of Good Management practices the firm is performing. In other words, the higher the value of the MQI, the better the firm Management Practices. Compared to the "Measure of Management Practices" elaborated by Bloom and Van Reenen (2007), our MQI is more accurate for 3 reasons. Firstly, our sample of firms is larger (more than 2.000 compared to 732). Secondly, we cover more aspects of the Management Quality, 6 categories (Leadership, Innovation, Collaboration, Employees, Digitalization and Results), compared to them, which only incorporate 3 aspects of the firm management (Monitoring, Targets, Incentives). Finally, our survey asks a larger number of questions to firms (46) compared to their survey (18).

3.3 Methodology

For our purposes, we will proceed in two steps. Firstly, we will focus on the management quality levels across different types of firms. Using the 1º Sample, we will estimate the average difference, in terms of MQI, between *Exporters* and *Non Exporters*, controlling for industry and firm size. We will extend this estimation to *Multinationals* and *Non Multinationals* (using the 2º Sample); and to *Domestics*, *Only Exporters* and *Multinational Exporters* (using the 3º Sample). Then, we will compare these management quality bonuses to the productivity bonus on exporters, already presented in literature.

Secondly, we will focus on the firm's export decision. We will create a management quality threshold, representing the minimum level of management quality needed by a firm in order to be able to export. Then, we will classify firms regarding this threshold (under and above the threshold) and compare the relative position of the firm to the threshold with the export status of the firm (exporter or non-exporter). We expect that all the firms with management quality level above (under) the threshold have decided to export (not to export). We will repeat this process with productivity and compare both results. Finally, we will extend the study to the firm's export decision by means of a Logit model estimation. The complete list of variables used in the model is presented in Table 2. Table 3 shows the correlation coefficients and statistics of the variables used in the analysis (industry variables are excluded from this table).

Table 2: Variable description

Variable	Definition
MQI	Value of the Management Quality Index, in logs
Productivity	Labour Productivity, in logs. Measured as the ratio of the Total Value Added, in thousands euros, and the average of the total number of employees
Exporters	1- if firm *i* exports in every year 0- otherwise
Multinationals	1- if firm *i* is involved in Foreign Direct Investment in every year 0- otherwise
Domestics	1- if firm *i* neither exports nor does Foreign Direct Investment in any year 0- otherwise
Only Exporters	1- if firm *i* exports in every year but is not involved in Foreign Direct Investment in any year 0- otherwise
Multinational Exporters	1- if firm *i* exports and is involved in Foreign Direct Investment in every year 0- otherwise
Small	1- if firm *i* in year *t* has less than 50 employees 0- otherwise
Medium	1- if firm *i* in year *t* has between 51 and 200 employees 0- otherwise
Large	1- if firm *i* in year *t* has more than 201 employees 0- otherwise
Industry (20 industries)	1- if firm *i* belongs to industry X 0- otherwise

Table 3: Descriptive Statistics of the Variables

	Mean	S.Dev.	Min	Max	1	2	3	4	5	6
				1º Sample						
	Mean	S.Dev.	Min	Max	1	2	3	4	5	6
1 MQI	2.12	0.81	0	3.66	1.00					
2 Productivity	3.70	0.71	-2.30	7.89	0.41	1.00				
3 Exporter	0.70	0.46	0	1	0.54	0.35	1.00			
4 Small	0.49	0.50	0	1	-0.54	-0.36	-0.49	1.00		
5 Medium	0.29	0.45	0	1	0.19	0.13	0.26	-0.62	1.00	
6 Large	0.22	0.42	0	1	0.44	0.29	0.30	-0.53	-0.34	1.00
				2º Sample						
	Mean	S.Dev.	Min	Max	1	2	3	4	5	6
1 MQI	2.06	0.80	0	3.66	1.00					
2 Productivity	3.66	0.72	-2.30	7.89	0.40	1.00				
3 Multinational	0.12	0.32	0	1	0.33	0.19	1.00			
4 Small	0.53	0.50	0	1	-0.52	-0.35	-0.36	1.00		
5 Medium	0.27	0.44	0	1	0.18	0.12	0.07	-0.65	1.00	
6 Large	0.20	0.40	0	1	0.44	0.30	0.36	-0.53	-0.30	1.00

	Mea	S.De	Min	Max	1	2	3	4	5	6	7	8
				3º Sample								
	Mea	S.De	Min	Max	1	2	3	4	5	6	7	8
1 MQI	2.08	0.81	0	3.66	1.00							
2 Productivity	3.68	0.72	-2.30	7.89	0.41	1.00						
3 Domestic	0.32	0.46	0	1	-0.54	-0.34	1.00					
4 Only Exporter	0.55	0.50	0	1	0.27	0.19	-0.76	1.00				
5 Multin.Export.	0.13	0.34	0	1	0.34	0.19	-0.26	-0.43	1.00			
6 Small	0.51	0.50	0	1	-0.53	-0.35	0.49	-0.21	-0.36	1.00		
7 Medium	0.28	0.45	0	1	0.19	0.13	-0.26	0.19	0.08	-0.63	1.00	
8 Large	0.21	0.41	0	1	0.44	0.29	-0.30	0.04	0.35	-0.53	-0.32	1.00

4- Results

4.1 Management Quality and Productivity Bonuses

Table 4 presents the main results of the regressions performed to estimate the Management Quality and Productivity Bonuses. In regressions (1) and (2) we have used the 1º Sample, including only those firms that export in all the periods in which they answered to the survey (*Exporters*) and those that do not export in any period in which they answered to the survey (*Non Exporters*). The results of the regression (1) prove the existence of a Management Quality bonus in *Exporters*. Controlling for size and industry differences, *Exporters* have, on average, 95% more management quality (0.667 MQI points measured in logs) than *Non Exporters*. Regression (2) exhibits a well known stylized fact (Melitz, 2003): the existence of a productivity bonus in *Exporters*. However, the size of this bonus is considerably small compared to the management quality bonus. Controlling for size and industry differences, *Exporters* are, on average, 36% more productive (0.306 productivity points measured in logs) than *Non Exporters*. The size of this bonus (0.306) comes along with Mainer's (2014) line, who found a similar productivity bonus in Spanish exporters.

In regressions (3) and (4) we have used the 2º Sample, including only those firms that perform Foreign Direct Investment in all the periods in which they answered to the survey (*Multinationals),* and those that don't perform Foreign Direct Investment in any period in which they answered to the survey (*Non Multinationals*). Regression (3) puts forward the existence of a Management Quality bonus in *Multinationals* as well. Controlling for size and industry differences, *Multinationals* have on average, 57% more management quality (0.452 MQI points measured in logs) than *Non Multinationals*. This result is consistent with Bloom et al. (2009) who found that multinationals were generally well managed in every country. Similarly, regression (4) highlights the existence of a productivity bonus in multinationals located in Spain, which fits with the results obtained by Helpman et al. (2004) for U.S. multinationals. Again, the size of the productivity bonus in multinationals is significantly small compared to the MQI bonus. *Multinationals* are only 13,5% more productive (0.127 productivity points measured in logs) than *Non Multinationals.*

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Table 4: GLS Estimation Results

GLS Regressions. Random Effects

Independent Variables	Dependent Variable					
	MQI (1)	Productivity (2)	MQI (3)	Productivity (4)	MQI (5)	Productivity (6)
Exporter	0.667*** (0.032)	0.306*** (0.032)				
Multinational			0.452*** (0.036)	0.127*** (0.037)		
Only Exporter					0.621*** (0.033)	0.289*** (0.032)
Multinational Exporter					0.939*** (0.046)	0.361*** (0.048)
Medium	0.294*** (0.029)	0.217*** (0.034)	0.369*** (0.029)	0.278*** (0.031)	0.260*** (0.030)	0.204*** (0.035)
Large	0.527*** (0.033)	0.361*** (0.037)	0.628*** (0.034)	0.460*** (0.038)	0.476*** (0.035)	0.357*** (0.041)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	7.700	7.700	8.151	8.151	7.263	7.263
Number of Firms	2.172	2.172	2.280	2.280	2.075	2.075
Between R^2	0.438	0.297	0.374	0.264	0.467	0.294
F Test Only Exporter = Multinational Exporter					0.000	0.049

Note: In all the regressions the dependent variable is in logarithms. In all the regressions we have controlled for 3 digits manufacturing industry. Robust standard errors (clustered by firm) are given in parentheses. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively. In the last row, we include the p-value obtained from the F equality Test. The Breusch-Pagan Lagrange Multiplier Test recommended the use of a Random Effects Regression against the use of a Pool OLS Estimation.

Finally, in regressions (4) and (5) we have used the 3º Sample, including those firms that neither export nor do FDI in any period in which they answered to the survey (*Domestics*), those that export in every period but are not involved in FDI activities in any period in which they answered to the survey (*Only Exporters*), and those that export and are engaged in FDI activities in every period in which they answered to the survey (*Multinational Exporters*). The results confirm the existence of a hierarchy of firms in terms of Management Quality. Compared to *Domestic* firms, *Only Exporters* and *Multinational Exporters* have, on average, 86% (0.621 MQI points measured in logs) and 155% (0.939 MQI points measured in logs) more management quality, respectively. In addition, *Multinational Exporters* have 37% (0.318 MQI points measured in logs) more management quality than *Only Exporters.*

However, the hierarchy of firms in terms of productivity is not so strong. According to the results from regression (6), *Only Exporters* and *Multinational Exporters* are, on average, 33% (0.289 MQI points measured in logs) and 44% (0.361 MQI points measured in logs) more productive than *Domestics* firms, respectively. In addition, *Multinational Exporters* are, on average, 7,6% (0.073 MQI points measured in logs) more productive than *Only Exporters.* However, as indicated by the F Test, we cannot reject at a 1% level that the productivity level is the same between *Only Exporters* and *Multinational Exporters.* In other words, even though productivity differences exist between firms serving only domestic market and those that also serve foreign markets, we cannot say that productivity differences between firms that employ different ways of internationalization exist. Furthermore, all the regressions show the importance of firm size in explaining management quality and productivity at the firm level. Larger firms are more productive and better managed than the rest of firms. This result comes

along the literature focused on studying the impact of the firm size in the economic performance of the firm (Bernard et al., 2003, for U.S firms; Fariñas et al., 2007, for Spanish firms).

4.2 Robustness Tests

Several robustness tests have been carried out in order to check the validity of the results. Regarding the composition of the sample, results do not change if we restrict the sample to only conserve those firms that answer the survey during 5 years (removing the firms that enter or leave the survey during the 2009-2013 period). On the other hand, if we include in the sample not only regular exporters, but occasional exporters as well, we find a new hierarchy of firms. Regular exporters are the most productive and better-managed firms; occasional exporters have intermediate levels of management and productivity; and finally, domestic firms present the lowest level of Management and productivity. However, these results change if we analyse the firms that occasionally invest abroad. There is no statistical difference, in terms of management quality or productivity, between occasional and regular multinational firms.

Regarding the measure of internationalization, instead of using the firm export condition we have used the firm export propensity as well. The results come along Merino's (2012) lines and show that once a firm reaches a certain level of exported sales (around 25% or 30% of total sales), its productivity level starts to differ from the rest of exporters, and begins to resemble the productivity level of multinationals. In other words, big exporters behave, in terms of productivity, similarly to multinational firms. However, if we focus on the management quality, results change. Thus, we find that there are no differences, in terms of management quality, between big exporters (those firms which export more than 25% or 30% of sales) and small exporters. The differences appear when we compare exporters, regardless of the weight of exports, with multinationals. In other words, the significant improvement in the management quality of the firm does not occur thanks to the increasing of the weight of exported sales, as it happens with productivity; it occurs when the firm becomes multinational. No only-exporter firm, regardless of the percentage of exported sales, will reach, on average, the management quality level of multinational.

Regarding the measure of Foreign Direct Investment, instead of focusing exclusively on the multinational condition of the firm, that is, wheter the firm invest abroad or not, we have gone deeper into investigating the number of countries in which the firm invests and its impact on management quality and productivity. According to Yeaple (2009), most productive firms invest in a larger number of foreign countries. Nevertheless, what Yeaple (2009) found for U.S. firms differs substantially from what we found for Spanish firms. Thus, we observe that there are not productivity or management differences between firms that invest in one, two, three or four different destinations. In fact, we found that there are differences between firms that do no invest abroad and firms that do invest abroad, multinational versus non-multinational firms, but we do not find any effect on productivity or MQI associated to the increase in the number of investment destinations.

In order to test the robustness of the MQI, we have decomposed the index into the six categories that conformed it: Leadership, Innovation, Collaboration, Employees, Digitalization and Results. We have regressed all the independent variables on these six categories in order to check the validity of these indicators. Results confirm that exporters have a bonus on all of these indicators compared to non-exporters. In other words, exporting firms possess more leadership and more management abilities, perform more innovation activities, collaborate more with partners and distributors, invest more in the management of their employees, have a more accurate digitalization strategy and have a better results measurement than non-exporting firms.

On the other hand, and due to the narrow association between the multinational condition of the firm and the MQI, we have also tested the role of the foreign ownership of the firm. Thus, we define that a firm is foreign owned when the foreign capital represents more than 50% of the social capital. Then, we test the impact of the foreign ownership on the MQI and on the six indicators as well. Results show that, controlling for firm size and sector, the foreign ownership condition of the firm is only relevant when it comes to explaining the "Employees" indicator of the MQI. In other words, foreign owned firms invest more in their employees and manage their staff better than domestic owned firms, regardless of the size, the industry, or the exporter condition of the firm.

Finally, we focus on the human capital role on the export performance of firms. Regressing the exporting condition of firms on the percentage of workers with tertiary education, we found that a human capital bonus exists on exporters as well. In other words, exporting firms have, on average, and controlling for firm size and industry, more educated workers than non-exporting firms. This result is also robust when we focus on the multinational condition of the firm.

4.3 Management Quality and Productivity Thresholds

Until now, we have shown that a management quality bonus exists, as well as a productivity bonus on exporters and multinational firms. Furthermore, we have demonstrated that differences between exporters and non-exporters and between multinationals and non-multinationals are greater in terms of management quality than in terms of productivity. Nevertheless, these bonuses are averages, and, as shown in the introduction, there are a substantial number of low productivity firms that are exporting and a considerable number of high productivity firms that are not exporting. Thus, the aim of this section is to identify these two kinds of firms and to account for them.

To achieve this objective, we will create a productivity threshold, a kind of productivity barrier, representing the minimum level of productivity needed by a firm to be capable of exporting. We will then classify firms according to this threshold and compare the relative position of the firm to the threshold (under and above) with the export status of the firm (exporter or non-exporter). In this sense, according to the theory of sunk costs presented by Melitz (2003), firms with under the threshold productivity levels, could not afford the sunk costs associated to the entry in export markets and, thus, should not export. On the contrary, firms with above the threshold productivity levels could afford these sunk costs and, consequently, should export[2]. Thereby, we expect that all the firms with productivity levels above (under) the thresholds are exporting (not exporting).

Following this same reasoning, we will create a management quality threshold as well, assuming that only better managed firms owned enough managerial assets to be able to export. In this sense, firms with under the threshold management quality levels could not export, while good managed firms owned enough leadership and ambition to be capable of exporting. At the end, we will compare both thresholds (management quality and productivity thresholds) in order to determine which of these two variables is more conclusive in the firm's export decision.

The Export Thresholds have been created as follows:

Productivity Threshold = Non-Exporters Productivity Median + Exporters Productivity Bonus

MQI Threshold = Non-Exporters MQI Median+ Exporters MQI Bonus

To create these thresholds we have used the 1º Sample. Bonuses are those from regressions (1) and (2). Following this same reasoning, we have created an additional threshold, for *Only Multinationals* firms. This threshold will establish the minimum level of Productivity or MQI needed in a firm to get involved in foreign direct investment. To create this threshold, we have used the 2º Sample and the bonuses from regressions (3) and (4).

Finally, the 3º Sample allows us to unify the export threshold and the FDI threshold in order to analyse the hierarchy of firms. Thus, using the bonuses from regressions (5) and (6), we create two other thresholds, this time in a same sample. The first of these two thresholds represents the minimum level of Productivity/MQI needed to start exporting, dividing firms between *Domestics* and *Only Exporters*. The second threshold represents the minimum level of Productivity/MQI needed to start FDI activities, dividing firms between *Only Exporters* and *Multinational Exporters*.

The next step is to analyse the number of firms that are satisfying the MQI threshold rule and the Productivity threshold rule, and to compare them. In other words, to determine which of these two variables is more relevant in the "real world". According to our methodology, only two kinds of firms can satisfy the rule: firms with an under the threshold Productivity/MQI level that are not exporting (not

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[2] Note that all the firms include in the sample are regular exporters, so, the export activity of these firms is not temporary or casual, but responds to a deliberate strategy of internationalization, durable on time.

investing abroad), and firms with an above the threshold Productivity/MQI level that are exporting (investing abroad). Figure 2 presents the main results of this threshold comparative.

Regarding exports, 75% of the firms are satisfying the MQI threshold. In other words, 75% of the firms that have high (low) levels of Management Quality in one year were exporting (not exporting). On the other hand, the Productivity threshold is valid for 68% of the firms: 68% of firms that have high (low) levels of productivity in one year were exporting (not exporting). Focusing on foreign direct investment (FDI), the gap between productivity and management quality is higher. While 72% of the firms satisfy the MQI threshold, only 61% of them satisfy the productivity threshold. Finally, taking the last sample into account, even though the effectiveness of thresholds is lower[3], the differences between MQI and Productivity are still present, 46% versus 36% respectively.

Figure 2: Firms satisfying the Threshold Rule
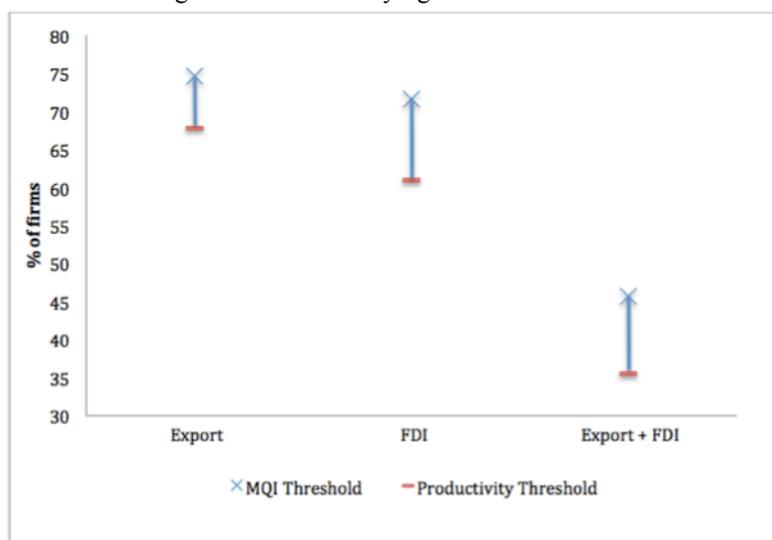
In order to test the robustness of the thresholds, we have changed its construction in several ways. Using the mean or the mode of non-exporters (non-multinational), instead of the median, results do not change. Instead of adding the MQI/Productivity bonus to the median (mean, mode) of non-exporters, we have subtracted the bonus to the median (mean, mode) of exporters. The results still do not change. This consistence of the Management Quality Threshold against the Productivity Threshold proves that the firm level productivity is not so critical in determining the firm export decision. In this sense, around 32% of the firms are permanently exporting with low productivity levels (or focused on the domestic market while having high productivity levels). On the contrary, the firm's management quality has revealed to be important, probably more than productivity, in explaining the behaviour of firms in international markets.

4.4 Logit Model

To go deeper into the firm's export decision, we have carried out a Logit model, where the dependent variable is the firm's export status. Table 5 presents the main results of the Logit estimation. In regressions (1) and (2) we have used the 1º Sample and the 2º Sample, respectively. Regression (1) shows that, controlling for size and industry differences, a 1% increase in the MQI, increases the firm's probability of exporting in a 0,19%. In other words, if the firm doubles the quality of its management practices, the probability of export will increase a 19%. However, the impact of a productivity increase on the export probability is considerably smaller: a 1% increase in firm's productivity will increase the firm's probability of exporting in a 0,08% (if the firm doubles its productivity level, the probability of export will increase in a 8%).

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[3] This fact is probably due to the existence of 3 kinds of firms (*Domestics, Only Exporters* and *Multinational Exporters*) and 2 thresholds, dividing the simple in 9 types of firms instead of 4 (as it was in the first and second sample).

Regression (2) exhibits similar results regarding the firm's decision of getting involved in foreign direct investment. Controlling for size and industry differences, a 1% increase in the MQI, increases the firm's probability of undertaking FDI in 0,03% (if the firm doubles the quality of its management practices, the probability of undertaking FDI will increase 3%). The impact of productivity in this firm's decision is significantly smaller: a 1% increase in firm's productivity will increase the firm's probability of engaging in FDI in 0,006%. Moreover, we can not reject at a 1% level that this probability is 0, in other words, we can not reject at a 1 % level that an increase in firm's productivity has not consequences in firm's decision of undertaking FDI activities.

Table 5: Logit Marginal Effects Estimation Results

Logit Regression

Independent variable	Dependent variable	
	Export (1)	Foreign Direct Investment (2)
MQI	0.194*** (0.009)	0.035*** (0.032)
Productivity	0.080*** (0.008)	0.006** (0.002)
Size Dummies	Yes	Yes
Industry Dummies	Yes	Yes
Number of observations	7.700	8151
Number of Firms	2.172	2.280
Pseudo R^2	0.394	0.306

Note: In all the regressions, coefficients exhibit the marginal change in the dependent variable, as a result of a 1% unit change in the independent variable. In all the regressions we have controlled for 3 digits manufacturing industry and for firm size. Robust standard errors (clustered by firm) are given in parentheses. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

In order to test the robustness of the estimation, we have regressed a Probit model as well. The results showed in the Probit model do not differ from the results in the Logit model, and both the Akaike Information Criteria (AIC) and the Bayesian Information Criteria (BIC) recommended the use of the Logit model against the use of the Probit model. In any case, results prove that the quality of the management practices have a greater role on firm's export decision compared to firm's productivity level.

5- Conclusions

In the last years, literature on International Trade has focused on learning more about the firm's behaviour in international markets. A number of theoretical models and empirical works have revealed the importance of factors such as productivity, firm size or innovation in explaining the firm's export decision or the firm decision of investing abroad. However, all this variables could respond to a deeper element in the core of the firm: the business management quality. In fact, recent empirical studies have shown the existence of a narrow correlation between the firm's management quality, and the firm's productivity level, firm's size and firm's innovation intensity. Now, this paper demonstrates the strong association between management quality and the firm's internationalization decision.

Using our Management Quality Index (MQI) as a proxy of the good management practices in a firm, we have shown two important facts regarding the internationalization process of the firm. Firstly, a management quality bonus on exporters exists, as well as a productivity bonus, and, the size of the management quality bonus is greater than the size of the productivity bonus. In other words, the

difference between exporters and non-exporters is greater in terms of management quality than in terms of productivity. Secondly, it is more determinant, regarding the export decision of the firm, to reach a minimum level of management quality (management quality threshold) than a minimum level of productivity, and that a change in the firm's management quality has a deeper impact on the export decision than a change in firm's productivity. In addition, we have seen that all these results are also extensible to explain differences between multinationals (firms involved in foreign direct investment) and non-multinationals, as well as to explain the firm's decision to invest abroad.

These results generate a wide range of implications for public policy design. In Spain, the internal demand has been depressed since the beginning of the recession in 2008, but the Spanish exports have given light to the Spanish economy, through a successfully growth spurt: if in 2007 exports represented 25% of the GDP, in 2015 they represented 33% of the GDP. However, not all the Spanish firms are exporting and, as shown, this is partly due to the management quality. In general, small firms are those who have the less export propensity and also the lower levels of management quality. A public policy oriented to provide advice on good management practices to small firms, could increase the firm's performance and, therefore, the firm's export propensity. Undeniably, a public policy with the aim of improving the management quality of firms could be more effective than a public policy with the aim of affecting the firm's productivity.

Appendix 1

Industry classification

Industry	Definition
Industry	*Definition*
1	Meat industry
2	Food products and tobacco
3	Beverages
4	Textiles and clothing
5	Leather and footwear
6	Wood industry
7	Paper industry
8	Graphic arts
9	Chemical industry and pharmaceutical products
10	Rubber and plastic products
11	Non-metallic mineral products
12	Ferrous and non-ferrous metals
13	Metal products
14	Agricultural and industrial machines
15	Computer, electronic and optical products
16	Machinery and electrical equipment
17	Motor vehicles
18	Other transport equipment
19	Furniture industry
20	Other manufacturing industries

Appendix 2

Variables included in the ESEE and used in the creation of the Management Quality Index (MQI)

Variables linked to leadership and management abilities (7 indicators)	Technological guidance or committee (DCT)
	Innovation activity plan (PAI)
	Use of consultants for technology information (UAIT)
	Owners and family support in leadership and management PAFDG)
	Expenditure on environmental protection (MEDGAS)
	Investment on environmental protection (MEDINV)
	Degree of diversification (IGM)
Variables linked to the operations management (processes, products and services) (14 indicators)	Product standardization (EP)
	Normalization and quality control (NYCC)
	Scientific and technique information systems (SICYT)
	Total innovations (NIP)
	Product innovations (IP)
	Process innovations (INP)
	Product and process innovations (IPYINP)
	Equipment goods acquisition for product improvement (ADBEM)
	Organizational methods innovations (IMO)
	Innovations in the external relations management (IMOGE)
	Merchandising innovations (ICO)
	Process innovations of new equipment (IPRME)
	Process innovations of software (IPRPI)
	Process innovations of new techniques (IPRTM)
Variables linked to the management of partnerships and resources (6 indicators)	Technological cooperation agreements (ACT)
	Technological collaboration with customers (CTCL)
	Technological collaboration with competitors (CTCO)
	Technological collaboration with suppliers (CTPR)
	Collaboration with universities or technological centres (CUCT)
	European Union research programme (PIUE)
Variables linked to the management of the staff (7 indicators)	External expenditure on language training (RGEFI)
	External expenditure on engineering and technical training (RGEFIF)
	External expenditure on sales and marketing training (RGEVM)
	External expenditure on computer and technologies training (RGEFIT)
	External formation on training in other themes (RGEFOT)
	Hiring employees with experience in the R&D public system (REPID)
	Hiring employees with experience in R&D (REEID)
Variables linked to the digital and technological policy and strategy (7 indicators)	Own internet domain (WEBPRO)
	Web page on the firm server (WEBEMP)
	Online purchases from suppliers (WEBCOM)
	Online sales to final customers (WEBB2C)
	Online sales to firms (WEBBEB)
	Evaluation of alternative technologies (ETAE)
	Evaluation of technological change prospects (EPCT)
Variables linked to the measurement of results (5 indicators)	Market surveys (EMYM)
	Innovation performance indicators (IRI)
	Online sales impact indicator (WEBVEN)
	Identification of the competitive position in the main market (PMPN)
	Positive evolution of the market share (ECM1N)

REFERENCES

Andrews, D., Westmore B. (2014). Managerial Capital and Business R&D as Enablers of Productivity Convergence. *OECD Economics Department Working Papers,* 1137, OECD Publishing.

Antràs, P. (2014): *Global Production. Firms, Contracts and Trade Structure.* Princeton University Press.

Bender, S., Bloom, N., Card, D., Van Reenen, J., Wolter, S. (2016). Management Practices, Workforce Selection and Productivity. Cambridge, MA: NBER Working Paper Series.

Bernard, A. B., Jensen, J. B. (1995). Exporters, Jobs and Wages in U.S. Manufacturing: 1976-1987. *Microeconomics,* 1995, 369-395.

Bernard, A. B., Eaton, J., Jensen, J. B., Kortum, S. (2003). Plants and Productivity in International Trade. *The American Economic Review,* 93(4), 1268-1290.

Bernard, A. B., Jensen, J. B., Redding, S. J., Schott, P. K. (2007). Firms in International Trade. *Journal of Economic Perspectives,* 21(3), 105-130.

Bloom, N., Van Reenen, J. (2007). Measuring and Explaining Management Practices Across Firms and Nations. *Quarterly Journal of Economics,* 122(4), 1351-1408.

Bloom, N., Van Reenen, J. (2010). Why Do Management Practices Differ across Firms and Countries?. *Journal of Economic Perspectives,* 24(1), 203-224.

Bloom, N., Sadun, R., Van Reenen, J. (2009). The Organization of Firms across Countries. Cambridge, MA: NBER Working Paper Series.

Bloom, N., Sadun, R., Van Reenen, J. (2013). Management as a Technology?.

Cezar, R., Escobar, O. (2015). Institutional distance and foreign direct investment. *Review of World Economics,* 151(4), 713-733.

Davies, R., Jeppesen, T. (2015). Export mode, firm heterogeneity, and source country characteristics. *Review of World Economics,* 151(2), 169-195.

Delgado M. A., Fariñas, J. C., Ruano, S. (2002). Firm productivity and export markets: a non-parametric approach. *Journal of International Economics,* 57, 397-422.

Eppinger, P. S., Meythaler, N., Sindlinger, M., Smolka, M. (2015). The Great Trade Collapse and the Spanish Export Miracle: Firm-level Evidence from the Crisis. Aarhus: Aarhus University.

Fariñas, J. C., Martín-Marcos, A. (2007). Exporting and Economic Performance: Firm-level Evidence of Spanish Manufacturing. *The World Economy,* 30(4), 618-646.

Guarascio, D., Pianta, M., Bogliacino, F. (2016). Export, R&D and new products, a model and a test on European industries. *Journal of Evolutionary Economics*, 1-37.

Grazzi, M., Tomasi, C. (2016). Indirect exporters and importers. *Review of World Economics,* 152(2), 251-281.

Heckscher, E. (1919). The Effect of Foreign Trade on the Distribution of Income. *Ekonomisk Tidskrift,* 21, 1-32.

Helpman, E. (1984): "A Simple Theory of International Trade with Multinational Corporations". *Journal of Political Economy* 92 (3), pp.451-471.

Helpman, E., Krugman, P. (1985). *Market Structure and Foreign Trade.* Cambridge, MA: The MIT Press.

Helpman, E., Melitz, M. J., Yeaple, S. R. (2004). Export Versus FDI with Heterogeneous Firms. *The American Economic Review,* 94(1), 300-316.

Helpman, E. (2011): *Understanding Global Trade.* Cambridge, MA: Belknap Press of Harvard University Press.

Huerta E., Salas, V. (2012). La Calidad del Recurso Empresarial en España: Indicios e Implicaciones para la Competitividad. *Papeles de Economía Española,* 132, 19-36.

Huerta E., Salas, V. (2014). Tamaño de las empresas y productividad de la economía española. Un análisis exploratorio". *Mediterráneo Económico,* 25, 167-191.

Johanson, J., Wiedersheim-Paul, F. (1975). The internationalization of the firm. Four Swedish cases. *The Journal of Management Studies,* 12(3), 305-323.

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,* 8, 23-32.

Krugman, P. (1980). Scale Economies, Product Differentiation, and the Pattern of Trade. *The American Economic Review,* 70(5), 950- 959.

Lucas, R. E. (1978). On the Size Distribution of Business Firms. *The Bell Journal of Economics,* 9(2), 508-523.

Mainer, C. (2014). La heterogeneidad empresarial y la actividad internacional de las empresas manufactureras españolas. Madrid: Universidad Complutense de Madrid.

Máñez, J. A., Rochina-Barrachina, M. E., Sanchis-Llopis, J. A. (2015). The dynamic linkages among exports, R&D and productivity. *The World Economy,* 38, 583-612.

Mayer, T., Melitz, M. J., Ottaviano, G. I. P. (2014). Market Size, Competition, and the Product Mix of Exporters. *American Economic Review,* 104(2), 495-536.

Melitz, M. J. (2003). The Impact of Trade in Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica,* 71(6), 1695-1725.

Merino, F. (2012). Firm's internationalization and productivity growth. *Research in Economics,* 66, 349-354.

Myro, R. (2015). *España en la economía global. Claves del éxito de las exportaciones españolas.* Barcelona: RBA.

Ohlin, B. (1933). *Interregional and International Trade.* Cambridge: Harvard University Press.

Pérez, F., Serrano, L. (2013). Capital humano y formación de directivos: Situación española y estrategias de mejora. *Economía Industrial,* 387, 87-107.

Ricardo, D. (1817). *On the Principles of Political Economy and Taxation.* London: John Murray.

Salas, V., Sánchez-Asín, J. J., Storey, D. (2014). Occupational choice, number of entrepreneurs and output: theory and empirical evidence with Spanish data. *SERIEs,* 5, 1-24.

Sebastián, C., Serrano, G. R. (2012). El entorno de la actividad empresarial en España. Un análisis comparado con la OCDE. *Papeles de Economía Española,* 132, 1-23.

Yeaple, S. R. (2009). Firm Heterogeneity and the structure of U.S. multinational activity. *Journal of International Economics,* 78, 206-2015.