

On the Relationship between Export Activity and Size

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Abstract

Together with the general and sector environment and various internal factors, firm size is one of the main groups of factors determining export activity. However, few works have examined this aspect, with the studies of Alonso and Donoso (1994, 1998) standing out in the Spanish case. The objective of this empirical work is, on the one hand, to describe the size of non-consolidated exporting Spanish SMEs or those not exporting but interested in export and, on the other hand, to assess the possible relationships between export activity and the size and other demographic characteristics of the firms participating in this study.

Key words: Internationalization of businesses, export, small and medium firms, firm size.

JEL Code: M21, M3, F23

1. The importance of firm size

There is no consensus about a single classification of factors determining exporting, since; while some authors agree in general, they sometimes differ in their opinions about which variables influence the exporting activity. However, most authors classify the determinants of that activity into two types; external environment factors and business area factors (Aaby and Slater, 1989; Alonso and Donoso, 1994, 1998). We understand the first type of factors to include cultural, political, social and macroeconomic factors, among others, and the second type to include aspects that are essential to the company strategy and the corporate capabilities that are necessary for the exporting activity.

While the most common criterion in classifying determinants of commitment to export is the distinction between internal and external factors, Alonso and Donoso (1994:114) establish that "it is necessary, however, to add a third relevant factor: the analysis of *management* attitudes and aptitudes". Those authors state that, from an alternative perspective, this factor can be considered to be included in the company's corporate resources, but that, because of its different nature, more subjective than objective, its relative autonomy compared to other factors, and its decisive influence on company behavior, it is advisable to treat it differently. In this respect,, Kamath, Rosson, Patton and Brooks (1987) differentiate between the determinants in the business area, the characteristics of the company itself and the decisive factors.

In reality, this new factor refers to a set of subjective factors that influence business decisions, making it necessary to include the dominant values within the firm, its willingness to take risks, management styles and other emotional factors. Thus, Alonso y Donoso (1994:115) argue that "[...] few variables have shown a more solid association in empirical studies than

that which links an exporting behavior with management aptitudes", citing the empirical works of Bilkey (1978), Aaby and Slater (1989) and Axinn (1985). Therefore, the fact that a firm includes an exporting activity in its strategic behaviors does not depend exclusively on it having the ability; those other, motivational factors are also needed since they decisively change the scope and quality of the decision to export.

It can be deduced from the works reviewed that there is a series of internal company factors that are linked to an exporting commitment. Three types of research can be distinguished from that review: (1) research focused on the analysis of internal factors affecting the decision to export (Pavord and Bogart, 1975; Welch and Wiedersheim-Paul, 1977; Reid, 1980; Cavusgil and Nevin, 1981), (2) studies that aim to identify differences in export commitment among a group of exporting companies (Axinn, 1985; Alonso and Donoso, 1994, 1998), and (3) works designed to explain the intention to export or to increase exports (Gripsrud, 1990; Yang *et al.*, 1992).

On the whole, company size has been one of the variables most studied as a possible determinant of an exporting behavior and of the internationalization process, with the relevant works in literature taking different postures toward the relationship between company size and exporting (*e.g.*, Bilkey and Tesar, 1977; Aaby and Slater, 1989; Christensen, da Rocha and Kerbel, 1987; Bonaccorsi, 1992; Caughey and Chetty, 1993; Lefebvre *et al.*, 1998).

The first problem that we encounter is the lack of a clear, unequivocal concept of company size, which makes it necessary to examine a great number of definitions that have been proposed. To give some examples, Aaby and Slater, (1989) understand size as the sales growth rate, while Caughey and Chetty (1993) refer to market share and Lefebvre *et al.* (1998) to the availability of financial and non-financial resources.

There are two main reasons for authors attaching so much importance to company size: 1) this variable serves as an approximate indicator of available resources, and 2) that information is easy to obtain from the number of employees, amount of assets or sales turnover (Rogers, 1995).

Regarding the results and conclusions of the studies that relate firm size to the export activity, some works have clearly reached the conclusion that large companies have an advantage when they internationalize (Christensen, da Rocha and Kerbel, 1987; Bonaccorsi, 1992; Lefebvre *et al.*, 1998), basically because of their greater financial and non-financial (personnel, knowledge, etc.) resources. However, other works argue that small and medium firms show a more active exporting conduct (*e.g.*, Alonso and Donoso, 1994). In the review of the literature, only Bilkey and Tesar (1977), after their empirical study, categorically state that size is not significantly related to the propensity to export. .

To be more specific, Cavusgil and Noar (1987) and Bonaccorsi (1992) defend the hypothesis that the smallest firms tend to expand in their domestic markets first, which entails lower levels first of uncertainty and risk. Furthermore, Bonaccorsi (1992) suggests the likelihood of becoming an exporting company may grow in line with the company size. However, that hypothesis excludes, on the one hand, high technology companies, for whom domestic demand is soon met and, on the other, companies with a product aimed at a market niche with a global demand, such as industrial equipment.

The review of the literature seems to reveal that large firms have more resources, have the advantage of a broader, more intensive sales operation and that they enjoy a greater ability to assume risks (Christensen, da Rocha and Kerbel, 1987; Gripsrud, 1990). One explanation of

why the probability of exporting increases with size refers to the need to have a minimum level of available resources, both financial and organizational (personnel, knowledge, etc.), to take on an exporting operation. .

Another argument implies that large firms with areas where they can make economies of scale (production, marketing, research and development, etc.) tend to increase their export activity. In this respect, Alonso and Donoso (1989) consider that economies of scale place large firms in a better position to export, since those economies reduce the unit cost.

There are two dimensions to economies of scale; static and dynamic (Helpman and Krugman, 1985). The static dimension is seen in the areas mentioned above, such as production, marketing or research and development, where there is high fixed expenditure, which, with increased sales, is spread over a greater number of units. The dynamic dimension is based on a learning curve in the firm due to the creation and dissemination of knowledge and technology inside the firm. In this respect, Bonaccorsi (1992) considers that this is the third basic argument explaining why the larger a company is, the more it benefits from exporting.

While economies of scale give the large firm advantages in the manufacture of standardized products or a differentiated range of goods (Christensen, da Rocha and Kerbel, 1987), the small and medium firm has the advantage of achieving a high level of specialization. This enables them to exploit market niches that would be of little interest to large firms and so facilitates their presence in markets that require differentiation or innovation in products. For Alonso and Donoso (1994), that advantage means that specialization, like innovation, boosts the exporting activity of small and medium companies by ensuring optimum use of their production capacity, on the one hand, and by recovering the financial effort devoted to the technological side, on the other.

2. Objectives and methodology of the empirical research

The objectives of our research are: (1) to measure the size of the firms participating in the study, (2) evaluate possible associations between the size and other demographic characteristics of the firm and (3) to examine the association between size and exporting commitment and the presence of a specialized export department.

With those empirical objectives in mind, we have chosen small and medium firms for various reasons. One is that the internationalization process follows a sequential strategy of approach to foreign markets that is mainly applicable to small and medium firms taking their first steps in international business (Young, 1987). Exporting is one of the first steps and is an almost obligatory step for small and medium firms.

Another is that, in Spain, small and medium firms constitute 99.9% of all companies and generate 64% of total sales but only 44% of exports (See Table 1). We must also take into account that 95.7% of large companies have export activities, while the percentage drops to 30.7% in the case of firms with fewer than 20 employees (Ortega and González, 2000).

Table 1: SMEs in Spain and the European Union
 Based on data from the INE (Spanish National Institute of Statistics)

	Spain	European Union
% SMEs of total companies	99.9%	99.8%
% Micro-companies (< 10 employees) of total companies	95%	93%
% SME sales of total sales	64%	70%

	Spain	European Union
% SME employment of total employment	70%	66%
% SME exports of total exports	44%	61%

Note: Data from DIRCE (Central Register of Companies), which stores a set of magnetic material encoded data prepared by the INE since the end of 1989.

The unit of analysis of this work comprises Spanish non-consolidated exporting firms and Spanish firms that do not export but are interested in doing so, all of which participate in the PIPE 2000 Program. This is a program of assistance in internationalization, specifically in the development of the foreign promotion and marketing stages of non-exporting Spanish SMEs with some interest in exporting, and non-consolidated exporting SMEs. The program is organized and run by ICEX⁵ and the Board of Spanish Chambers of Commerce with the collaboration of the Autonomous Communities. Every year the administrations involved in the management of the program run advertising campaigns and take widespread communication actions via the national, regional and local governments, as well as through business associations. That leads us to assume that few non-exporting firms that are, or have been, interested in exports are not included in the program. We should also point out the choice of this program is seen favorably since it covers an entire, known and multi-sector population, while its partial results, 2,000 new export companies in the year 2000, indicate the accomplishment of its objectives (Ortega and González, 2000).

Thus, our unit of analysis comprises Spanish non-consolidated exporting companies and those firms not exporting but interested in doing so, all of which are participating, or have participated in PIPE 2000 from 1997, when it began, to November 2002. Our sample population was 2,590 firms, the total of those meeting the above requirements

The instrument used to gather the information was a postal questionnaire mailed to every firm in the population. To be specific, a self-reported postal questionnaire was used since the population was large and geographically widespread (Ortega Martínez, 1990), and because of the limited resources available to perform the research. The questionnaire was the result of careful preparation and considered the recommendations of Ortega Martínez (1990) regarding brevity, simplicity, relevance and precision. To make the questionnaire easier to complete, and to avoid non-response, closed or semi-open questions were preferred and were based on a review of the mainly empirical literature. We should mention that the individuals chosen to receive the questionnaire, and consequently be the informants providing the data necessary for our research, are those ultimately responsible for their companies' exports. This is because they are the ones who have the competence to make export decisions within the firm.

A total of 478 of the 2,590 firms that were sent questionnaires collaborated in the research, which means a response rate of 18.5%, with a sampling error of 4.22%. However, the real response rate was 18% after our rejection of 15 questionnaires that had some basic questions left unanswered, had been completed by the wrong person, or the correct participant recognized the uncertainty in his/her answers⁶. As a result, the final sampling error was 4.5%.

⁵ Spanish Institute of Foreign Trade (ICEX). Ministry of industry, Tourism and Trade.

⁶ To measure the accuracy of their answers, the participants were asked to indicate the degree of certainty with which they had answered the questions. They indicated that degree on a Likert type scale from 1 to 7 (total uncertainty to total certainty) and an average value of 5.90 was obtained, with a typical deviation of 0.84. All questionnaires that obtained a value of less than 4 were rejected.

Apart from the traditional descriptive aspect of the size of the participating firm, there was also a series of statistical analyses to identify possible associations between size and a set of variables referring both to the firms' demographic characteristics (sector, turnover, legal form of enterprise and average net profit margin) and to characteristics of the export activity (presence of an export department and propensity to export).

2. Results

The size of the participating firms

As already mentioned, the relationship between firm size and export activity is one of the most widely studied aspects in the literature on international businesses, and an almost obligatory analysis in any study of the exporting behavior. Size is a synthetic variable to which many other aspects regarding the firm's technical possibilities and economic, management and financial capacity may be related. From this perspective, size provides a simple, frequently available criterion for defining company groups with homogeneous characteristics and strategic possibilities. The concept of firm size is quite relative in any sector that we consider, since it can be measured using different parameters or criteria, such as turnover, number of employees or productive capital, among others.

The empirical works on the export behavior of companies have used various criteria to measure firm size. These include sales turnover or volume of business (*e.g.*, Reid, 1985) and/or number of employees (*e.g.*, Axinn, 1985), with the latter being more usual (Alonso and Donoso, 1998). According to those authors, "even when the workforce is the most used variable, size can be calculated by other factors expressing business activity, such as turnover or exports, those three variables have some relationship with one another, but with some interesting connotations" (Alonso y Donoso, 1998:7). However, Ortega and González (2000:89) suggest that "company size defined by the number of employees has a significant effect on exports".

Considering the purpose of our research and the characteristics of our population, we thought it best to use the workforce as the measure of company size. The questionnaire contained an open question asking the participant to indicate the average number of employees per year, subsequently recoding it into the categories traditionally used in the literature⁷: (1) micro-firms, with fewer than ten employees, (2) small firms, with between eleven and forty-nine employees; (3) medium firms, with between fifty and two hundred and fifty employees and (4) large firms with more than two hundred and fifty employees. The respective frequencies are shown in Table 2.

However, in order to exercise prudence regarding which measuring instrument to use, we decided to include turnover as an alternative measure of size. The intervals are as follows: between 0 and 0.6 meuros (between 0 and 100 million pesetas), between 0.6 and 1.8 meuros

⁷ Most national research works carried out in Spain that have considered this variable (*e.g.*, Alonso and Donoso, 1994, 1998; Ortega and González, 2000) include the same categories as we have used in this work, but with different values in the case of the small, medium and large firm. They consider small firms to be those with between 10 and 99 employees, medium firms those with between 100 and 499 and large firms those with over 500 workers. We have followed the criterion laid down by the Spanish Ministry of Finance's Directorate General of Small and Medium Firms, which, in turn is in line with Recommendation 96/280/EC (3 April 1996) of the European Commission, whose financial criteria were modified in 2003 and will come into force on 1 January 2005. For that reason, any extrapolation or comparison of the results obtained in this work with previous studies must be made with caution as far as firm size measured by number of employees is concerned.

(100 and 300 million pesetas), between 1.8 and 3 meuros (300 and 500 million pesetas), between 3 and 6 meuros (500 and 1.000 million pesetas), between 6 and 9 meuros (1.000 and 1.500 million pesetas), between 9 and 15 meuros (1.500 and 2.500 million pesetas) and more than 15 meuros (2.500 million pesetas). We can see from the number of employees that 56.3% of the firms surveyed are small, 17.3% are medium and 25.3% are micro.

Table 2: Firm size measured by number of employees

N° employees	Absolute frequency	Total cases	Valid cases
Micro (from 1-9)	112	24,2%	25.3%
Small (from 10-49)	250	54%	56.3%
Medium (from 50-249)	78	16,8%	17.3%
Not identified	23	5%	-
Total	463	100%	100%

We consider that, apart from using the number of employees to calculate the firm size, it is also necessary to study the turnover of the firms surveyed. Due to the fact that many companies would not give the exact sales turnover, we decided to ask for that figure by intervals, which are shown in Table 3.

It can be seen that 26.3% of the collaborating firms had a turnover of between 0.6 and 1,8 meuros, while the lowest percentage of firms in one interval was the 5.7% that had an annual turnover of more than 15 meuros.

Table 3: Firm size measured by turnover

Millions of euros	Millions of pesetas	n Sample	% Sample
0-0.6	0-100	66	15%
0.6-1.8	100-300	115	26,3%
1.8-3	300-500	78	17.8%
3-6	500-1,000	88	20%
6-9	1,000-1,500	37	8.4%
9-15	1,500-2,500	30	6.8%
More than 15	More than 2,500	25	5.7%
Not identified		24	-
Total		463	100%

Association between size and other demographic characteristics of firms

1. Firm size and activity sector

The results of the χ^2 test show that there are significant differences between the activity sector and the firm size ($\chi^2=28,123$; $p=0,001$). Thus, service and food and agriculture companies are significantly smaller than consumer goods companies and industrial companies.

The results of the frequency analyses in Table 4 reveal that, in the food and agricultural products sector, 46% of the companies are small and 33% are micro. In the consumer goods sector, 56% are small firms and 26% micro-firms, while 66% of firms in the industrial sector are small and 15% micro. Finally, the distribution of firms in the service sector is as follows: 48% small, 43% micro and 9% medium.

Table 4: Association between activity sector and firm size

Sector \ Size	Micro	Small	Medium	Total
Food/agricultural products	33%	46%	21%	100%
Consumer goods	26%	56%	18%	100%
Industrial products	15%	66%	19%	100%
Services	43%	48%	9%	100%

2. Firm size and turnover

The results of the χ^2 test ($\chi^2=345,107$; $p=0,000$) confirm a significant association between these two variables and we now describe the frequencies shown in Table 5.

The joint analyses of firm size and turnover reveal that 83.8% of companies turning over between 0 and 0.6 meuros are micro-firms, while 90% of those with a turnover above 15 meuros are medium-sized. Similarly, medium firms, representing 73.3% of those with a turnover of between 9 and 15 meuros, are the largest group in that interval, while small firms had a greater presence in the 0.6 to 9 meuros range.

Table 5: Association between firm size and turnover

Size	Turnover		From 0 to 0.6 Meuros		From 0,6 to 1.8 Meuros		From 1.8 to 3 Meuros		From 3 to 6 Meuros		From 6 to 9 Meuros		From 9 to 15 Meuros		Above 15 Meuros	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Micro	52	83.8	38	33.3	10	13.6	3	3.5	4	11.2	1	3.4	-	-		
Small	9	14.6	75	65.8	59	81	64	75.3	20	55.5	7	23.3	2	10		
Medium	1	1.6	1	0.9	4	5.4	18	21.2	12	33.3	22	73.3	18	90		
Total	62	100	114	100	73	100	85	100	36	100	30	100	20	100		

3. Firm size and legal form

A check of the possible association between firm size and the legal form, using the χ^2 test, shows that those two variables are related ($\chi^2=45,447$; $p=0,000$).

In that respect, Table 6 shows that most public companies are small (62.8%) and medium (26.4%) firms, while 31% of limited companies are micro and 55.7% are small firms. In the case of cooperative companies, 71.4% are small while 58.3% of companies with other legal forms are micro.

Table 6: Association between firm size and legal form

Legal form Size	Public Company		Limited Company		Cooperative		Others	
	n	%	n	%	n	%	n	%
Micro	17	10.8	78	31.7	1	14.3	14	58.3
Small	98	62.8	137	55.7	5	71.4	9	37.5
Medium	41	26.4	31	12.6	1	14.3	1	4.2
Total	156	100	246	100	7	100	24	100

4. Firm size and net profit margin

The results of the independence test using Pearson's correlation coefficient show a significant association between firm size and the average net profit margin of domestic sales ($r^2=-0,139$; $p=0,018$), and also between size and the average net profit margin from foreign sales ($r^2=-0,133$; $p=0,025$). In both cases, as the size of the firm increases, so the net profit margin falls.

The results, which are shown in Table 7, indicate that foreign sales of products are more profitable than domestic sales for the micro and medium firms in our sample, while domestic sales are more profitable in the case of small firms.

Table 7: Average net profit margin by firm size

Size	Margin	Average profit margin in domestic market	Average profit margin in overseas market
Micro		21.11%	21.94%
Small		18.08%	16.53%
Medium		15.32%	17.06%
Total		18.45%	17.96%

Furthermore, the data contained in Table 8 show that the net profit margin for domestic sales did not exceed 20% in more than 60% of the cases in all three firm sizes analyzed..

**Table 8: Association between firm size and average net profit margin
(in percentages)**

Size	Micro-firm		Small		Medium	
	Domestic	Export.	Domestic	Export.	Domestic	Export.
% Profit						
Below 10%	29%	25%	51%	46%	50%	49%
11% - 20%	35%	41%	21%	28%	31%	27%
21% - 30%	16%	15%	14%	15%	7%	10%
31% - 50%	18%	14%	9%	8%	9%	7%
Above 50%	2%	5%	5%	3%	3%	7%
Total	100%	100%	100%	100%	100%	100%

Association between firm size and exporting activity

1. Firm size and the existence of an export department

In our search for possible significant associations, we also examine the possible relationship between firm size and a certain company complexity regarding international activity. In this

case, we only considered the responses from informants who held the position of export manager or a similar position.

In relative terms (see Table 9), the highest percentage of firms with export managers was found in medium firms (49%), followed by small firms (37%) and micro firms (27%). If we refer to the results of the test between the two variables ($\chi^2=10,906$; $p=0,012$), we can conclude that there is a significant association of 5% between them.

Table 9: Association between firm size and export department

Size \ Export. Dept.	Yes	No	Total
	Micro	27%	73%
Small	37%	63%	100%
Medium	49%	51%	100%
Total	36%	64%	100%

Therefore, those results support the idea that there is a certain correlation between firm size and the presence of an export department, at least in Spanish firms, as proposed in the work of Alonso and Donoso (1998:52). Those authors state that "there is a clear and growing association between size and an export department [...], a tendency that is also evident in previous years since it is due to the higher financial capacity and greater organizational complexity that accompanies an increase in the firm's size". They go on to say that "Similarly, there is a clear positive association between an export department and the propensity to export." (Alonso and Donoso, 1998:53).

2. Firm size and the propensity to export

In order to check whether that last statement is true in the case of the firms in our sample, we prepared a double-entry table (Table 10). The results show that in more than 70% of the sample companies, a maximum of 25% of their total exports was independent of the firm's size. The results obtained from performing suitable tests, in this case Pearson's r^2 , on the data regarding total turnover and export turnover in 1996 ($r^2=0,023$; $t\text{-valor}=0,442$; $p=0,659$), and 2001 ($r^2=-0,49$; $t\text{-valor}=-0,655$; $p=0,514$), enable us to state that the propensity to export seems to be independent of the firm's size, since the correlation between the two variables is practically nil, contrary to what was proposed by Alonso and Donoso (1998).

Table 10: Association between the propensity to export and firm size (in percentages)

Size \ % of Exports	Micro-firm		Small firm		Medium firm	
	1996	2001	1996	2001	1996	2001
Below 25%	83%	78%	90%	78%	88%	73%
26% to 50%	7%	14%	3%	14%	5%	17%
51% to 75%	7%	6%	3,5%	5%	7%	7%
Above 75%	6%	2%	3,5%	3%	-	3%

% of Exports \ Size	Micro-firm		Small firm		Medium firm	
	Total	100%	100%	100%	100%	100%

4. Conclusions

More than half of the companies participating in the PIPE 200 program are small firms, most of them falling in the interval of between 10 and 30 employees. The rest of the companies are micro-firms, followed by medium firms.

Our empirical research seems to find a significant association between firm size (measured by number of employees) and the exporting activity, however, we find no clear relationship between size and the propensity to export, unlike other studies that have found such a relationship to be significant (e.g., Reid, 1980; Aaby and Slater, 1989; Gripsrud, 1990; Lefebvre, Lefebvre and Bourgalt, 1998).

We have found three possible explanations for the differences between the results of this study and those of other works. The first is that the intervals of employee numbers used for the categories or firm size differ from those that we used (0-9, 10-49, 50-249 and 250 or more for the micro, small, medium and large firms respectively, in our case, as opposed to 0-9, 10-99, 100-499, and 500 or more in the other works). We should point out that we applied the classification established by the European Commission in their recommendation 96/280/EC.

The second possible explanation refers to the fact that our population does not include consolidated exporters or a significant percentage of non-exporting companies. The final explanation may be that most of the reviewed works included SMEs and large firms in the same sample and mostly found a significant relationship between the two variables. However, we chose to exclude large firms from our study and found no such association in the cases of micro, small and medium firms.

Perhaps that relationship should be qualified in the sense that significant associations related to size are seen insofar as large firms show significant differences in their propensity to export compared to SMEs as a whole. However, that may not justify saying that there are significant associations between micro firms and/or small firms and/or medium firms, especially when all, or almost all, the firms are exporters. In this way, perhaps this offers an explanation of why 95.7% of large Spanish firms export, while the percentage falls to 30.7% of firms with fewer than 20 employees (Ortega and González, 2000).

Moreover, in the Spanish case, our review of the literature revealed only one study that examines the association between size and the propensity to export, and that work confirms the weakness of that relationship. The work of Alonso and Donoso (1998:24) show that "the relationship between size and propensity to export is [...] doubtful: the Spanish case confirms that lack of definition".

As regards the evaluation of the possible relationship between firm size and a certain organizational complexity for international activity measured by the presence of the post of export manager or similar, our results support the idea of a correlation between firm size and an export department, as suggested by Alonso and Donoso (1998). In spite of the above, and analyzing each variable with firm size, we must state that there are significant differences related to sector. In this respect, service and food and agricultural product companies are

smaller than those in the other two macrosectors in the study, namely consumer goods and industrial goods.

There is also a significant association between firm size (measured by number of employees) and total turnover. Size and legal form also show a significant relationship insofar as, the larger a firm is, the greater the probability of it becoming a public company rather than a limited company. As regards the possible significant relationship between the profit margin (average net domestic and export profit margins) and firm size, our results confirm such an association where the larger the firm is, the lower its profit margin will be.

Finally, we should point out that this research work represents a starting point for the development of further studies. Those future studies, besides replicating this research in other national contexts, should include other variables of the export activity apart from the propensity to export and the existence of an export department, one example being the mode of entry.

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