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KNOWLEDGE SPILLOVERS TO EXPORTERS: NEW INSIGHTS

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Abstract

Adding to an emergent research stream, I study whether exporters benefit from knowledge spillovers in foreign markets. I do so by using alternative proxies for learning from international markets and export experience. This is relevant as empirical findings until the moment seem fairly contingent upon the choice of the dependent and independent variables. My argument is that firms may learn from their foreign sales and that this learning may help them improve their competitive position in their home market (in terms of market share). However, I contend that repeated interaction with foreign agents is needed for knowledge to flow to the firm. My results show that increasing the commitment to foreign markets has a positive impact on domestic market share, but only in the short term. Firms learn from exporting, but knowledge obtained abroad becomes obsolete relatively quickly.

JEL classification: F23, L10, L60, M16

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1. INTRODUCTION

As firms have increasingly expanded internationally the outcomes of multinationality have attracted much attention from researchers over the years. A good illustration of this growing interest is the recent publication in *Management International Review* of a focused issue on ‘Internationalization and Firm Performance’ (MIR, 47(3), 2007), which reviews and provides new insights to a 40-year tradition of research on this topic.

One of the benefits associated to internationalization has been the sourcing of knowledge from foreign markets (Almeida, 1996; Penner-Hahn and Shaver, 2005). Indeed, some studies have shown that asset-seeking motivations are behind international expansion (Kogut and Chang, 1991; Shan and Song, 1997; Wesson, 1999). Most of this research on the internationalization-performance relationship in general, and on the learning from foreign operations in particular has focused on FDI. Nevertheless, a research line has emerged and grown recently in the economics (and, to a lesser extent, in the strategy) literature that explores the learning implications of firms’ export behavior.

However, results are conflicting in this literature. While most studies find no significant effect of export behavior on firm performance (see, among others, Aw and Hwang, 1995; Bernard and Wagner, 1997; Bernard and Jensen, 1999; Aw *et al.*, 2000; Delgado *et al.*, 2002; Fariñas and Martín-Marcos, 2007), some others find evidence of learning by exporting to take place (Kraay, 1999; Castellani, 2002; Wagner, 2002; Girma *et al.*, 2004; Aw *et al.*, 2007). Some scholars have attributed this divergence of findings to the use of inadequate proxies for learning (Salomon and Shaver, 2005a) or for export (Castellani, 2002).

Then, as choosing the appropriate variable/s for capturing knowledge acquisition or learning seems to be key for properly assessing some of the benefits that firms may realize from internationalization. More studies that complement the existing literature are thus needed if we want to have a better understanding of this phenomenon. Also, in view of the mixed results in the literature, new findings will also help inform theory on the exports-learning relationship.

Accordingly, this paper tries to complement and add new insights to this relatively recent body of research.

To do so firstly I propose a different form of measuring learning by exporting: domestic market share increments. I argue that this may be a suitable proxy as it is a way of assessing if firms really apply the learning they obtain in international markets to their home market operations and whether this knowledge is useful and helps them get a better competitive position in their home market. So, by using this proxy we will not only be able to know whether firms learn from their foreign sales, but also whether they actually use the knowledge available to them in the host market(s).

And secondly, I consider the effect that commitment to and experience in foreign markets may have on organizational learning. In this vein I argue that knowledge acquisition is influenced by the frequency of interaction with foreign agents. Entry into international markets itself does not guarantee learning. Thus a committed and/or stable presence in those markets (permitting a continuous and repeated interaction with foreign agents) may be necessary for learning to take place.

2. LEARNING BY EXPORTING: ARGUMENTS AND HYPOTHESIS

The potential for learning by exporting has been recently discussed in the literature. Exporters are argued to benefit from information and knowledge spillovers in foreign markets. By exporting, firms engage in interaction with foreign agents and through this interaction they may have access to information and knowledge that is not available (to firms) in their home market¹. Therefore, competing in foreign markets exposes exporters to best practices and permits them to acquire and accumulate valuable information. This information may be either technological or market related (Clerides *et al.*, 1998). For example, the firm may learn from the technical expertise of its foreign buyers (Clerides *et al.*, 1998), which may lead to the introduction of new product designs and/or new methods of production. Or the firm may gather new knowledge concerning customers' preferences and/or in respect to the existence of competing firms and products, which may lead to better targeting its products in its markets, to the improvement of existing products (Mitchell *et al.*, 1992) or, again, to the creation of radically new ones (Salomon, 2006).

Based on this rationale, a growing number of studies in the international economics literature have analyzed whether internationalized firms actually realize those potential benefits from exporting. Their argument is that if firms learn from international markets, exporters will then be more productive and efficient than their non-internationalized counterparts. Thus, learning by exporting will manifest in improved *ex-post* firm performance. In this vein, they look at whether increases in exporters' productivity and efficiency occur after the initiation of foreign market sales². If so, they would conclude that

¹ In order for this to happen, knowledge must be spatially bounded and therefore unavailable to those who are not players within those limits (Salomon and Shaver, 2005a).

² They also look at (and obtain empirical support for) whether strength in the home market allows firms to internationalize by exporting. I will not further explore this argument as it is beyond the scope of this study.

learning by exporting takes place. However, most of these studies have failed to find a significant and positive effect of exports on productivity (see, among others, Aw and Hwang, 1995; Bernard and Wagner, 1997; Bernard and Jensen, 1999; Aw *et al.*, 2000; Delgado *et al.*, 2002; Fariñas and Martín-Marcos, 2007). Only a few have found evidence of such a positive relationship (Kraay, 1999; Castellani, 2002; Wagner, 2002; Girma *et al.*, 2004; Aw *et al.*, 2007).

Some scholars have pointed at different (though related) causes as the primary source for this mixed evidence on the learning by exporting hypothesis.

On the one hand, within the international economics field, some researchers have claimed that correctly choosing the export measure is influential on the findings about learning from foreign sales. In this vein, when finding that there are large differences in learning effects between recent entrants and established exporters, Kraay (1999) allows for the possibility that the failure of earlier studies to find learning effects may be simply the result of not accounting for different export histories among firms. Similarly, Castellani (2002) argues that the presence in international markets itself does not necessarily lead to learning. Experience on and commitment to foreign activities is required to gain such learning. He observes that studies using export status (export / does not export) as a proxy of export behavior find no learning effects, whereas studies using the share of exports on total sales (export intensity) tend to find positive learning effects.

On the other hand, within the international business literature, other researchers attribute the heterogeneous and somewhat contradictory results on learning by exporting to the dependent variable used by economics' researchers. Salomon and Shaver (2005a) argue that,

for several reasons, productivity and efficiency measures may not fully and directly capture the learning potential derived from foreign sales.

Accordingly, they depart from previous studies and try to capture those learning effects by examining the influence of export behavior on innovative outcomes. They suggest that product innovation and patent counts may more directly reflect learning from international sales. By doing so, they find significant evidence supporting the learning by exporting hypothesis.

Considering all of the above, finding a positive influence of export behavior on learning seems to be highly contingent upon correctly choosing the dependent as well as the independent variables. Thus, if we want to obtain more informed conclusions about the potential for learning that international markets have, more research is needed. In this vein, I try to add some new insights to the learning by exporting literature by considering combinations of the independent and dependent variables different from the ones used in previous work on the topic. This may contribute to the extension and refinement of knowledge in this field and to inform theory.

In the first place, I subscribe Salomon and Shaver's (2005a) arguments about the appropriateness of productivity and efficiency measures used in the economics literature as proxies for learning. In this vein, I propose a different way of capturing learning by exporting: domestic market share increments. To the best of my knowledge, this variable has not been used in the economics literature that has studied this phenomenon. In the strategy literature it has been used by Mitchell *et al.* (1992), albeit as a performance indicator. However, they present a set of case studies where they find that those firms that increase their

market share while also increasing their international presence³ do so partly because they incorporated at home technological advances obtained in their foreign subsidiaries. Thus, they argue that in order to gain from increased international presence firms must use their foreign operations as a source of learning.

Accordingly, I argue that domestic market share increments may be a suitable proxy for learning as they not only capture whether firms learn from foreign sales, but also, and what may even be more relevant, whether they actually apply the learning they obtain abroad to their home market operations and whether this knowledge is useful and helps them get a better competitive position in their domestic market. So by using this proxy we will not only be able to know whether firms learn from their foreign sales, but also whether they actually use the knowledge available to them in the host country/countries.

And secondly, I also agree with Castellani's (2002) argument about the need of repeated interaction with foreign agents for knowledge to be obtained. However, this study differs from his in two basic aspects. On the one hand he relies on productivity indicators to measure learning. As stated above, this type of measure may not be the most appropriate for this purpose. Accordingly, I do assess the impact of export behavior on domestic market share which, as argued earlier, I believe is a better proxy for learning. And on the other hand, to take into consideration the relevance of experience in foreign markets I use export volume instead of export intensity as an explicative variable, because of the methodological problems involving the latter⁴.

³ *In their analysis (and in their findings) they do not distinguish between the effect of becoming an exporter, from that of initiating foreign manufacturing or from that of becoming a multinational firm (defined as one that combines domestic and foreign production, exports and imports).*

⁴ *These are detailed in the following section.*

Considering all of the above, I argue that knowledge spillovers take place in international markets and that exporters may benefit from them. By exporting, firms interact with a variety of actors in international markets (customers, brokers, competitors...) that would have escaped their purview had they not exported. By this interaction, exporters may receive valuable information and acquire knowledge that otherwise would be unavailable to them. I also argue that what is relevant about this knowledge is that firms may apply it in their home market. For example, they may learn how to develop newer or better products or how to better target their offerings to customers' demands. As that knowledge is actually not available to their non-exporting competitors, everything equal, exporters will do better than non-exporters in their home market. Nevertheless, participation in export markets itself does not guarantee learning. Besides, interaction with foreign agents (consumers, intermediaries, competitors...) must be repeated for relevant information to flow to and be assimilated by the firm and for knowledge to be built and applied. So learning is dependant on commitment and experience in export markets. Thus, I argue that those firms more committed to international sales will be more likely to learn from foreign agents and consequently to improve their competitive situation in their domestic market. I then propose the following hypothesis:

H1: The higher the commitment to exports of a firm, the higher its learning from international markets and, thus, the higher its domestic market share.

3. DATA AND ECONOMETRIC MODELS

3.1. Data

In testing the previous hypothesis I have employed data for the Spanish economy. Specifically, the *Encuesta Sobre Estrategias Empresariales* (ESEE from here on) -Spanish Survey on Business Strategies- has been used. ESEE is a yearly survey conducted on a representative sample of Spanish manufacturing firms employing 10 or more workers. The survey is drawn up annually by the *Fundación SEPI* (SEPI Foundation) and is currently co-sponsored by the Spanish Ministry of Industry, Tourism and Trade.

For this empirical study, data from the ESEE for the years 1990-2002 are used, allowing the use of panel data structure. However, it is worth noting that this is an unbalanced panel, as the same number of observations for all firms is not available. This is due to several reasons.

In the first place some of the firms have stopped participating in the survey throughout these 13 years. Nevertheless, new firms have been incorporated to the survey during all these years. As is logical, no information is available for these new firms in the years previous to the one in which they started participating in the survey. Table 1 shows the evolution of the sample over the years.

TABLE 1 ABOUT HERE

In the second place, even when a firm participates in the survey, it does not always provide information for all fields in the questionnaire. Thus, there are many missing values for some of the variables used in this study.

In the third place, the structure of the ESEE questionnaire (especially in respect to market information) has imposed several restrictions in the analysis, making it necessary to drop some data. In the questionnaire sent by the *Fundación* the firms are asked to identify the geographical scope of their main markets⁵: Spain, other countries or both. The rest of the information in respect to that market is thus linked to its geographical scope. Considering that this study is focused on identifying the variations in the Spanish market share as a consequence of exporting I have only used data for those firms indicating the Spanish market as their main market. Thus many observations are lost.

In the fourth place, consistent with my argument that firms will apply foreign knowledge in their domestic market, I have excluded from the analysis firms switching industries in any of the 13 years for which data is available. The applicability of knowledge gained in a specific activity to a different one is potentially more difficult. Thus, variations in domestic market share for these firms may surely not be attributable to learning by exporting.

And finally, the econometric technique that has been used (specifically, estimation in first differences and the use of lags) has also imposed a notable reduction in the number of observations that can be used in the estimation of the model.

⁵ Up to a maximum of five. Many firms provide information for only one market, so I have decided to limit my analysis to that market.

For all the above, I not only work with an unbalanced panel, but I do it with a much smaller number of observations that is initially available.

3.2. Variables

3.2.1. *Dependent variable*

According to previous arguments, the dependent variable chosen in this study is the market share that a firm holds in its domestic market, expressed as a percentage. Given the characteristics of the econometric technique used, the model is estimated in first differences, what automatically turns this variable into an increment: that of market share one year to market share in the previous year.

3.2.2. *Independent variable*

I have proxied commitment to international markets and the degree of interaction with foreign agents by export volume (in absolute terms) in a given year.

Though the most widely used indicator in the literature in this respect is export intensity (export sales to total sales), export volume is preferred due to some methodological issues associated with how export intensity is measured. Total sales include domestic as well as foreign sales. Thus, increments/decrements observed in export intensity are not necessarily associated to an increased/decreased commitment to foreign markets (higher/lower export volume), but they could be caused by a fall/rise of sales in the domestic market even in the absence of variations in export volume. Given the radically different implications of each

alternative to our argument, I have opted to use export volume in absolute terms rather than a measure of export commitment in relative terms.

3.2.3. Control variables

In the estimation of the econometric model presented later in this study I have controlled for a set of factors that, besides learning by exporting, may cause domestic market share to vary.

I first control for firm size to diminish the potential for a size effect in my data. Large firms generally have greater resource bases than small firms, so they normally have greater market power than the latter. Size has been proxied by the number of employees.

Similarly, foreign investors may inject resources into the firm that may help it improve its competitive position in the market. In that case, we would expect participated firms to realize higher domestic market shares. Besides, learning may not come from internationalization itself for participated firms, but from access to technological and market information from the parent firm. Then, in order to control for the way in which foreign ownership may affect the focal firm's home market share, I incorporate foreign capital participation as a control variable. This is defined as the percentage of ownership held in the focal firm by foreign companies in a given year.

Also, reputation and brand image may have a positive impact on market share. Therefore I control for a firm's expenditures in advertising and public relations in a given year. Although the ESEE does not identify whether these are aimed at the domestic or

foreign markets, I assume that most of them are aimed at the Spanish market. This assumption is consistent with some empirical evidence showing that advertising expenses either do not have an effect on exports (Cavusgil and Naor, 1987) or have a negative one (Benvignati, 1990). It is also in line with Caves' (1981) argument that advertising does not carry well across borders, so firms investing on it do so to increase their domestic sales.

Besides, certain changes in the market may affect a firm's share on it.

For instance, changes in competition. Entrance of new firms will make it more complicated to increase market share. On the contrary, if the number of competitors decreases, a firm's market share may increase only because there are fewer firms competing in the market, but not necessarily because the firm had learnt from foreign markets or because it is outperforming its competitors. To control for these effects I have built a dummy variable taking value 1 if the number of competitors that hold a significant share of the Spanish market has decreased in respect to the previous year, and value 0 otherwise.

Similarly, the evolution of the domestic market may also have a clear influence on a firm's share on it. If the domestic market is growing, we may expect firms to increase their market share even in the absence of learning from foreign markets. However, if a firm gets to increase its domestic market share in a stagnant or declining market, that will be clearly indicating that the firm is doing something better than its competitors. According to my arguments, that may be due to the use of foreign knowledge obtained through exporting. Thus, I have built and included as an additional control a dummy variable taking value 1 if a firm's domestic market is growing and 0 otherwise.

Additionally, I have taken into account the possibility of a persistence effect on market share. That is, that a favorable competitive position in the market in the past causes a favorable competitive position in the market today. Following Mitchell *et al.* (1992) I have included as an additional control the change in the firm's domestic market share lagged one period.

Finally, a set of annual dummies has also been included as a control in model specification.

3.3. Econometric model

The proposed hypothesis has been tested by means of the Arellano and Bond (1991) linear, dynamic panel data estimator, known as the generalized method of moments (GMM). This econometric technique adequately resolves the endogeneity of some explanatory variables, especially of the proxy for export experience.

To do so the GMM estimator employs instrumental variables, this way avoiding correlation with the error term (ϵ_{it}). Specifically, the instrument used for export volume has been its own value lagged one period. Proxies for size and reputation have been instrumented the same way, using their own values also lagged one period.

Besides, estimation of the proposed model is done in first differences, which eliminates firm-specific effects and provides unbiased estimates. In this way we avoid spurious correlations between export volume and Spanish market share due to unobservable firm characteristics that affect both variables.

On the basis of the above, the general model to be considered is as follows:

$$\Delta X_{it} = \lambda \cdot \Delta X_{it-1} + \beta_n \cdot \Delta Y_{it-n} + \gamma_m \cdot \Delta Z_{it-m} + \phi \cdot \Delta V_{it} + \mu \cdot W_{it} + \delta \cdot T_t + \Delta \varepsilon_{it}$$

where the variables are described as follows.

On the one hand, X_{it} and Y_{it-n} denote, respectively, the indicators for domestic market share and export volume for firm i . Three lags have been taken for the latter variable to allow for the possibility that the effect of export commitment on market share might not be immediate. Thus, $n = 0, 1, 2, 3$.

On the other hand, Z_{it-m} brings together two variables: firm size and advertising expenditures. Lags have also been taken for these variables, though in this case only for one year. Thus, $m = 0, 1$.

V_{it} represents participation of foreign capital, while W_{it} groups the two dummy variables accounting for changes in the Spanish market: the one for market evolution and the one tracking variations in the number of competitors.

Finally, T_t corresponds to the set of annual dummies.

With the exception of the dummies, all variables are expressed in increments (Δ) as estimations are made in first differences.

Econometric tests were performed with Stata 9.1 for Windows.

4. RESULTS: DISCUSSION

Table 2 presents the results obtained after estimating the proposed model. Coefficients for all relevant variables (with the exception of time dummies) are presented, as well as values for the Sargan test and the test for second-order autocorrelation in the first-differenced residuals⁶. Table 2 also gives information on the number of firms and observations.

TABLE 2 ABOUT HERE

One first consideration in respect to Table 2 is that the values of both the Sargan and the autocorrelation tests do not let us reject their respective null hypotheses. This is indicative of the appropriateness of the instruments used, as well as of the treatment given to the different variables. Validity of the model is thus confirmed.

In respect to results themselves, it is worth noting that all of them are highly significant (including time dummies, not presented in the table).

⁶ Sargan test proves the absence of correlation between the instruments and the error term. I only include the test for second-order autocorrelation in the differenced residuals as the presence of first-order autocorrelation does not imply inconsistent estimates, what would however be the case in the presence of second-order autocorrelation (Arellano and Bond, 1991).

Starting with the control variables, the signs of the coefficients for advertising expenditures and for the dummies capturing market evolution and the variation in the number of competitors are as expected.

As may be observed in Table 2, increasing the expenses in advertising and public relations, both in the current as well as in the previous year, is positively linked to current increments in the firms' domestic market share. Thus, it is confirmed that investing in corporate image or at least in adequately communicating what the firm offers to consumers pays off in the short term in the form of a better competitive position in the market. These results are consistent with the positive effect of advertising expenditures on domestic market sales found in other studies (Salomon and Shaver, 2005b).

Also, my results show that firms may increase their domestic market share due to favorable conditions in that market. In fact there is evidence supporting that both competing in a market that is growing⁷ (as compared to do it in one that is stagnant or declining), as well as competing in a market in which the number of competitors has decreased (as compared to do it in one in which it has remained stable or it has increased) let firms increase their market share.

However, coefficients for the proxies for firm size and foreign capital are negative, which runs counter to what was expected. This would be indicating that increasing firm size or participation of foreign capital in the firm's ownership structure make the firm's domestic market share fall.

⁷ *This is consistent with the evidence found by Salomon and Shaver (2005b) for domestic market sales.*

In respect to size, this unexpected result may be related to the indicator used: the number of employees. Increasing personnel may generate some complexities in the firm, at least in the short term (which is the time span in which we have measured the effect of this variable on market share). Besides the time necessary to fully integrate new employees in their new environment, some management and coordination problems may arise if the increment in size is high, which may lead to difficulties in firm operations. This may in turn lead to worse quality of products, longer delivery times... which will surely be reflected in a fall in demand and, as a consequence, in market share.

And in respect to the percentage of foreign capital in the firm's ownership structure, it may be the case that foreign investors would lack local knowledge and that, at least in the short term, there would be a mismatch between their decisions and the characteristics and demands of the Spanish market. A fall in market share would again be the outcome.

Besides, results show a clear persistence effect in market share. Strength in the domestic market in the past makes the firm grow in its domestic market today.

Now focusing on the main variable in this study, export volume, we observe that its effect on market share is contingent upon the time span considered. Results in Table 2 show that recent increments in foreign sales (up to one year) have a positive effect on domestic market share (which is consistent with my hypothesis), but increments in export volume realized two and three years before will have a negative impact on domestic market share.

These results show that *in the short term* a more committed presence in international markets helps firms to improve their competitive position in their home market. According to

our arguments, increasing export volume will let firms interact with foreign agents more frequently, which in turn will let them acquire knowledge that afterwards they will apply in their operations in the home market. Thus, in the short term exports and domestic sales are complementary. This finding is interesting in the sense that it complements that of Salomon and Shaver (2005b) who, using the same data (though for a shorter period), do not find significant effects of exports on domestic market sales.

If, as has been argued throughout this paper, there is learning from a committed and repeated presence in foreign markets the negative coefficients for the increments of export volume lagged two and three periods may be explained in terms of the temporal usefulness of the knowledge acquired. Knowledge is argued to be time sensitive (Levitt and March, 1988; Argote, 1999). Old knowledge becomes obsolete and less relevant in new environments as products and processes evolve (Argote, 1999). My results would support this argument. If consumer tastes change over time, applying old knowledge would not let the firm meet their customers' needs and expectations. Lower demand and reduced market share are the likely outcomes. This evidence is consistent with Perkins' (2008), albeit in a different context.

Notwithstanding what has been said so far, it is necessary to take into account that the magnitude of the coefficients for export volume is rather low. So the effect (in either way) of increasing international presence and interaction with foreign agents, though statistically significant, must be taken with certain caution.

5. CONCLUSIONS

In the last years there has been an increasing interest in the literature in the study of the learning that firms may get from foreign markets. Despite the good amount of work that has been done so far, findings have been heterogeneous. Taking into account the factors leading to this divergence in results I have attempted to add complementary evidence in respect to learning by exporting, with the aim of advancing knowledge of this phenomenon. To do so I have used combinations of dependent and independent variables different from those traditionally used in the literature.

In this respect, I have found additional evidence of learning from exporting to take place. The outcome of this learning, however, is different from what has been previously shown in the literature. Aside from some productivity improvements (Kraay, 1999; Castellani, 2002; Wagner, 2002; Girma *et al.*, 2004; Aw *et al.*, 2007) and especially from innovative outcomes (Salomon and Shaver, 2005a), my results show that knowledge obtained from foreign markets may also help firms to increase their domestic market share. Besides, and in line with what the literature have previously shown, I have also found evidence supporting the relevance of commitment to and experience in international markets for learning to take place.

Additionally, considering the results presented in the previous section, we may also draw the following conclusions from them.

On the one hand, firms may make strategic decisions that will help them strengthen their competitive position in their domestic market. Committing to international markets and

making use of the knowledge gained in them, investing more heavily in corporate image and reputation or at least in an adequate communication of their offer are factors under direct control of the firm that will let it increase its domestic market share. In this respect it is also important to take into account that it is the more recent investments the ones that will have the desired effect. Thus, even when it is possible and relevant to learn from interaction with foreign agents, the knowledge acquired will only be useful for a relatively short period of time. This implies that firms have to make an effort to apply this knowledge quickly. If too much time goes by between obtaining knowledge and applying it, knowledge will become obsolete and instead of helping the firm to better target consumers' needs and expectations, it will have the opposite effect.

And on the other hand my results also show that there is another set of factors, *a priori* (and in the short term) beyond the firm's direct control, that will affect its competitive position in the market. Specifically, the expansive/declining cycles of the market, as well as the entry/exit of competitors. In the most likely case that the firm will already be competing in the market, there is limited scope for action about it. In that case, when facing unfavorable conditions in the market the firm should concentrate on using the strategic variables in its power to offset those negative effects and, if possible, to modify them in its own benefit. However, if the firm is considering whether to enter a new market or not, those are factors that it should take into account before making such a decision, as they may affect its future success in that market.

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TABLE 1: SAMPLE EVOLUTION (1990-2002)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1. Surviving sample^a		2,188	2,059	1,977	1,869	1,876	1703 ^c	1,716	1,920	1,776	1,754	1,870	1,724
1.1 Participate	2,188	1,888	1,898	1,768	1,721	1,693	1,584	1,596	1,764	1,631	1,634	1,693	1,635
1.2 Disappear		62	52	72	53	51	28	35	18	45	38	20	18
1.3 Do not answer		187	62	124	45	55	33	54	22	35	24	0	12
1.4 No access		51	47	13	50	77	58	31	116	65	58	157	59
2. Firms recovered^b		129			99								73
3. New firms		42	79	101	56	9	132	324	12	123	236	31	0
Total # of firms	2,188	2,359	2,438	2,539	2,595	2,604	2,736	3,060	3,072	3,195	3,431	3,462	3,462

^a 1.1+2+3 from the previous year.

^b In 1991 these are large firms that had already received the questionnaire in 1990 but had not answered. In 1994 these are large firms that had previously answered the questionnaire, but stopped doing so at some point.

^c One firm stops collaborating in 1995 but is recovered in 1996.

Source: http://www.funep.es/esee/datos_esee.asp

TABLE 2: RESULTS

	Δ Spanish market share _t
Δ Spanish market share _{t-1}	0.3037191*** (235.48)
Δ Export volume _t	0.000000393*** (8.28)
Δ Export volume _{t-1}	0.00000162*** (18.66)
Δ Export volume _{t-2}	-0.00000295*** (-73.48)
Δ Export volume _{t-3}	-0.00000599*** (-115.51)
Δ Advertising expenditures _t	0.00000409*** (15.64)
Δ Advertising expenditures _{t-1}	0.0000125*** (4.91)
Δ Firm size _t	-0.0784201*** (-24.07)
Δ Firm size _{t-1}	-0.0064825*** (-3.31)
Δ Participation of foreign capital _t	-0.3156909*** (-7.61)
Evolution of the Spanish market _t	4.809749*** (48.82)
Variation in the number of competitors _t	3.394992*** (39.32)
Sargan test	0.4059
Autocovariance in residuals of order 2 test	0.4488
Number of observations	451
(Number of firms)	(102)

Two-step estimator.

* (**) (***) indicates, respectively, significance at the 10% (5%) (1%) levels. Z values in parenthesis, below coefficients.

Year dummies included as control variables but not presented.

Source: Own elaboration based on ESEE data