SPILLOVERS IN EXPORT ENTRY DECISIONS ACROSS MARKETS

Jesús Ángel Muñoz
Diego Rodríguez

Universidad Complutense de Madrid and GRIPICO

Abstract: This paper addresses sequential entry in export markets. It focuses on externalities derived from previous activity in countries close to those for which a potential entry decision is adopted (*geographical spillovers*) and those derived from previous presence of other firms in the same industry (*industrial spillovers*). The empirical analysis uses Spanish microdata for the period 2000-2010 in a gravity function framework that also integrates market size, distance, country risk and firm size. The results suggest the positive effect of both geographical and industrial spillovers in the entry, though some changes in the effects of distance are obtained when regional spillovers are considered.

Keywords: Sequential entry, spillovers, export activity
JEL code: F10, F14

Corresponding authors:

Jesús Ángel Muñoz Sepúlveda
Department of Applied Economics II
Universidad Complutense de Madrid
Campus de Somosaguas
28223, Pozuelo de Alarcón (Madrid)
jesusangel.munoz@ccee.ucm.es;
Telephone: 91 394 2642

Diego Rodríguez Rodriguez
Department of Applied Economics II
Universidad Complutense de Madrid
Campus de Somosaguas
28223, Pozuelo de Alarcón (Madrid)
drodri@ccee.ucm.es
Telephone: 91 394 2477

1. Introduction

The literature on International Trade has extensively analyzed firms' decisions to enter in foreign markets. In this matter, different papers have studied the persistent nature of export decisions, which are likely related to sunk costs firms face when they decide the entry. It is usually assumed that the current choice of entry in export markets depends on previous decisions - i.e., lagged explanatory variable- (Esteve and Rodríguez, 2012). A complementary literature addresses the whole pattern of export activity by analyzing the duration of export activity spells (Besedes and Prusa, 2006a, 2006b; Esteve *et al*, 2013).

The analysis of export decisions by firms, or even the duration of their export activity, does not usually consider multi-market characteristics of export strategies. This sharply contrasts with the empirical evidence, which points out that multi-market (and multi-product) exporters, that is, firms exporting to more than one country (and more than one product), represent an important percentage of total exports in developed countries. This multi-market feature suggests that geographical or industrial spillovers coming from previous export decisions in other markets could make easier entry in new export markets. This paper analyzes the existence of such externalities, which support the presence of a sequential pattern of entry in export markets. The underlying model is based on an entry sequential assumption that suggests that exporting decisions are made in two stages. In the first stage, the firm decides to enter in a specific market. In the second stage, the firm decides to expand to new export markets. In doing so, previous decisions for geographically close markets would have a positive influence. It does not neglect the presence of entry sunk costs, but merely that such costs would be lower, in the second stage, if firms have a previous stronger position in the regional area.

The spillover effects considered are twofold. On the one hand, those effects coming from previous entry decisions in countries with similar economic, social or cultural characteristics. We assume that these characteristics depend on the proximity between markets, so we refer them as *geographic spillovers*. On the other hand, the entry decision in a specific market could also depend on previous choices taken by other firms that elaborate similar products. This previous entry by other firms located in the same home country generates an information externality that may influence firms that decide *ex novo* to enter in this new market. We refer to this effect as *industrial spillover*. The presence of *industrial spillovers* effects linked at the

export entry is considered as a main argument to justify export promotion policies (Volpe and Carballo, 2010).

By contrast to other countries in which detailed information on export activities by individual firms (microdata) can be obtained, restrictions for the Spanish case lead us to use the data provided by the network of Spanish Chambers of Commerce (Cámaras de Comercio), which are complemented with some basic information provided by SABI (Bureau van Dijk Electronic Publishing). The analyzed period covers 2000-2010. These microdata are combined with country information in the context of a gravity function approach. However, in contrast to the traditional gravity function, the variable to be explained here is a binary variable that analyzes the entry decision by each firm in each market and year. Therefore, the analysis focuses on the extensive margin, defined as the diversification associated to products, countries and/or firms of the aggregate trade data. The lack of data about trade volumes does not allow us to analyze the intensive margin. The empirical analysis combines probit and fixed effects logistic regressions. The latter allows us to control for observable and unobservable firm characteristics, taking advantage of panel characteristics of the set of decisions taken by each firm across export markets.

Two preliminary conclusions related to spillover effects are obtained. First, results point out the positive influence of industrial spillovers. Second, results also suggest the existence of regional spillovers. Additionally, GDP and firm size have a positive effect in the entry, while the signs of distance and risk are negative. However some changes in the effect of distance are obtained when regional spillovers are considered.

The remainder of the paper is organized as follows. Section 2 reviews the recent literature related to sequential entry into export markets. In Section 3, data and some descriptive results are presented. The econometric analysis and main results are contained in Section 4. Finally, Section 5 concludes.

2. Previous research

The recent literature about sequential exporting has increased in the last few years. A common starting point is the influential work of Melitz (2003), who emphasizes the relevance of sunk costs that firms face to start exporting. A main characteristic of the Melitz model is that it assumes that fixed export costs are homogenous between different export markets. However, it could be expected that these costs are specific for each market. The differences between export costs would arise by differences in uncertainty levels, due to imperfect information about the market size, the requirements for product adaptation in the new market, or the performance of the distribution channel, among others. There are at least two possible ways to reduce uncertainty and, therefore, entry costs. Firstly, firms may adopt a sequential entry process, in which previous steps could help to current decisions. Second, new exporters may benefit from strategies followed by other firms in that new destination. The literature about both ways has increased in the last decade.

The study of Chang (1995) is one of the first papers about the sequential process of internationalization, although in this case applied to FDI flows. In particular, the author analyzes the entry process of the Japanese manufacturers in the U.S. market. He observes the existence of two differentiated stages in the entry process. In the first stage, firm enters in the new country through its main business line in order to reduce competition risks with domestic firms. In a second stage, firm gradually introduces other products or activities, including those that initially do not show a clear comparative advantage in the new market. The empirical evidence suggests that sequential entry allows Japanese firms to develop a set of more competitive skills or capabilities in foreign markets. With this strategy, Japanese firms were able to increase significantly their presence in international markets.[1]

The previous paper analyzed entry in foreign markets related to product diversification of business lines in a specific market. However, a complementary perspective addresses the sequential entry in different markets. Eaton *et al* (2008) did it considering entry in export markets for Colombian firms. Their results show a very high rotation rate in export destination, suggesting that almost half of exporters in a given country were not exporters to

[1] Chang (1995) also notes that the successful Japanese internationalization process was due also to the amount and duration of the FDI flows. Japanese firms opted by small volumes of FDI in the long run, in contrast with the occidental strategies to internationalize large investments flows in the short time.

that market in the previous year. The model also identifies two stages in the sequential entry process. In the first stage, the firm begins to export to only one market. If that action is successful, it would start to expand gradually in a greater number of destinations. Therefore, the sequential entry of firms, along with the probability of survival as exporter, depends crucially on the firm's success in the choice of its first destination.

Sequential exporting has also been addressed more recently in Albornoz *et al* (2012), who analyze that process by considering sunk cost and uncertainty that firms face. With Argentinian data for 2000-2007, their results point out that uncertainty about entry success into export markets is key to understand export patterns. They suggest that uncertainty is strongly correlated with time and markets. The study also points out that uncertainty about export success is central to understand the export pattern, since that uncertainty is strongly correlated with time and markets. They develop a model to analyse these implications in which i) the firm finds out its profitability level as consequence of his entry into the export market, ii) the firm can take new decisions about the entry in new markets and iii) once the firm decides to enter in new markets and overcome sunk cost, the correlation between export profitability across markets generates incentives to enter into new markets sequentially. Accordingly, the model indicates that exporting firms benefit from information spillovers that promote entry into new markets, through the reduction of entry sunk costs. The paper also suggests a number of trade spillovers that affect the mechanisms of coordination policy between markets. For example, exports in a country could increase as a consequence of liberalization trade policies taken by other countries.

Related with the presence of uncertainty and information spillovers, Segura-Cayuela and Villarubia (2008) analyze these variables and their influence in export entry. They combine a framework of monopolistic competition between heterogeneous firms in their productivity levels (similar to Melitz, 2003), and entry decision in foreign markets under uncertainty. The main conclusion suggests that uncertainty about size market or about traded products substantially affects entry decisions. This uncertainty determines firm behavior with regard to their entry strategy into foreign markets: export, horizontal FDI, vertical FDI, etc. Similarly, Blum *et al.* (2013) have studied the different ways of entry (and exit) in export markets and, based on that, they model firm-level decisions. In particular, they analyze occasional and perennial exporters.

The relevance of fixed and variable export cost is also addressed in di Giovanni and Levchenco (2012), who analyze the link between entry costs and the extensive margin. In this sense, they develop a multi-country model based in Melitz (2003) and Eaton *et al.* (2011) to explain the importance of fixed and variables cost of trade and the extensive margin for welfare. In this same research line, Eaton *et al.* (2012) use a standard heterogeneous-firm to model the importance of entry cost in trade relationships. Departing from that model, they estimate a gravity equation with aggregated bilateral trade and production data and, then, they simulate entry costs in different markets. The results show that reductions in trade costs increase substantially entry in new bilateral trade relationships, although the value of this new flow is small. In particular, a reduction of 10% in trade barriers increases bilateral trade in 206 new relationships.

Previous papers are examples of a growing literature which indicates that sunk entry costs reduce substantially as a consequence of the previous entry in another markets. Firms are able to develop some kind of *learning-by-exporting* or adaptation related with previous experience in export market, which allows them to overcome more easily sunk entry costs. Sheard (2012) also follows this line of research. His paper predicts that more productive firms choose to enter in a large number of markets and quickly. In contrast, firms with lower productivity levels tend to export in a few numbers of small markets, before exporting to large scale.

As it was commented previously, entry decisions may be affected by previous decisions taken by other firms that export to the same area. This is a part of a vast literature that emphasizes the influence of information spillovers in the choice of export markets. The study of Requena and Castillo (2006) is an example for Spanish firms. Using a sample of small exporter in 1990-1994, the authors identify the existence of spillovers by using several indicators about the geographical concentration of exports. They conclude that only the within-industry agglomeration of Spanish exporters affects significantly to the probability of starting to export in a particular destination.

In relation to trade duration, Esteve *et al* (2013) apply a survival analysis with Spanish data and obtain two relevant conclusions. Firstly, they conclude that export status presents highly persistence, while the destination portfolio is very dynamic. Secondly, they suggest that heterogeneity, measured at the firm and destination levels, is key to explain exporting survival. Besedes and Prusa (2006a) also analyze trade duration, finding that US import flows

have a very short duration. In another paper, Besedes and Prusa (2006b) estimate a Cox proportional hazard model to obtain the main determinants of the trade durations. They conclude that higher product differentiation reduces exit hazard. They also show that the value of the initial trade flow positively affects trade duration.

3. Data and descriptive analysis

This paper combines microdata (firm level information) with industry and country characteristics. As usual, the main problem lies on acceding to individual data on export activity, due to the Spanish Customs does not provide access to that information.[2] Therefore, the database used is the Directory of Spanish Exporting and Importing Firms, which is elaborated by the Spanish Chambers of Commerce in collaboration with the Spanish Tax Agency. This is the only available source with firm level data about export markets and products for Spanish firms. It provides information for every country and product with a trade flow (export and import) for each year in the period 2000-2010. Products are defined according to the Combined Nomenclature (2 digits).[3] Unfortunately, the information about products and countries is not crossed, but it is tabulated apart from one another. Additionally, the database provides information on the overall volume of exports in three segments: less than one thousand euros, between that amount and one million euros, and more than one million euros. This database is not elaborated by using sampling criteria from the overall population of exporting firms. By using the business name, that database has been matched with accounting information contained in the SABI database, elaborated by Bureau van Dijk Electronic Publishing. The matching procedure has led to a final simple of 5,044 firms. A firm is in the panel in 5.7 years in average. The majority of firms incorporated in first years (59.5% in 2001, 21.0% in 2002 and 7.7% in 2003), while fewer entries in the panel are observed later.

[2] Many studies of internationalization for Spanish firms use the Encuesta Sobre Estrategias Empresariales (ESEE). However, that database only provides quadrennial information for four very aggregated geographical areas.

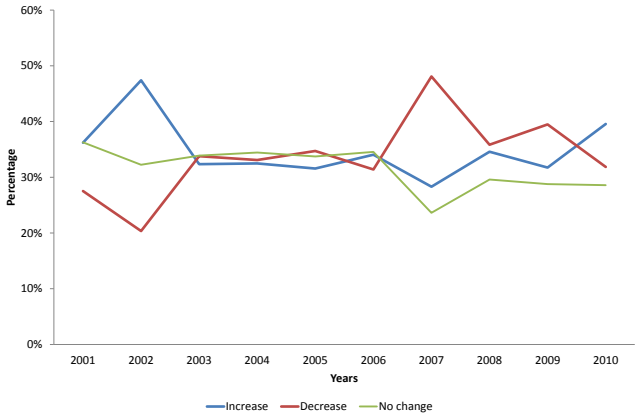
[3] The database is accessible in http://aduanas.camaras.org/. A technical procedure to extract the information was implemented.

Table 1: Distribution of export markets

	2000	2005	2010
Distribution of firms (%):			
1country	29.04	25.71	21.99
2-5 countries	34.30	35.04	31.18
6-10 countries	13.81	13.94	15.37
11-25 countries	15.74	16.55	19.44
26-50 countries	5.54	6.73	8.83
> 50 countries	1.57	2.04	3.19
Average # of countries (per firm)	7.85	8.82	10.83
Total # of firms	7,539	7,954	5,766

Table 1 shows the distribution of firms according to the number of export markets in 2000, 2005 and 2010. As can be seen, for each year almost one fourth of all exporters only sell in one country. As expected, the distribution is highly asymmetric, with a large share of firms exporting to very few countries: almost have of them export to less than six countries. Anyway, this concentration is smaller than obtained by Bernard *et al*. (2007). They concluded that more than 60% of US firms exported to one country, while 13.7% of them exported to more than five countries. Apart from differences between countries related, for example, to larger openness of the Spanish economy, the sample here used may have some biases towards medium and large-sized firms, for which more presence in export markets is expected. Additionally, the average number of exporting countries (i.e., destination countries for Spanish exporters) increases throughout the analyzed period from 7.8 to 10.8. This increase is compatible with a huge turmoil in the firm level behavior. As can be seen in Figure 1, the percentage of firms that do not change their total number of exporting countries in two consecutive years was pretty stable around 35% before the start of the crisis. After 2007, variations in destination markets increased and that percentage decrease to 28%. The percentage of firms that increase or decrease their number of countries in the short-term (i.e., in two consecutive years) is clearly correlated, so increases in the number of exporting countries go associated with a negative variation in the number of destination countries. As we can see, with the start of the crisis in 2007, the percentage of firms that reduced their number of countries was about 50%, while firm increasing its number of markets was close to 28%.

Figure 1: Distribution of firms (%) according to the variation in the number of exporting countries in two consecutive years



As it is expected, Spanish firms mainly trade with other firms located in EU countries. In every year of the sample, Portugal and France were the two main destinations. Distance is, obviously, a main explanatory factor: eleven of the fifteen most frequent export markets belong to the EE. Only the United States, Mexico, Morocco and China are non-EU countries in that short list. This geographical distribution is in accordance with the aggregated data coming from the Balance of Payments which point out that 70% of Spanish exports were traded with EU countries.

Table 2: Main (most frequent) export markets (% of firms)

	2000	2005	2010
Portugal	35.67	35.77	46.25
France	35.54	36.28	45.42
Italy	25.88	28.19	36.19
Germany	26.86	27.66	35.14
UK	25.11	25.65	30.44
Andorra	20.68	25.69	28.89
USA	23.50	24.93	28.23
Belgium	20.56	21.07	26.66
Netherlands	18.90	20.39	25.72
Morocco	14.18	16.28	23.57
Switzerland	15.49	19.25	23.31
Mexico	14.99	17.92	21.19
Poland	9.97	11.87	19.67
Greece	13.34	15.34	18.63
China	4.58	10.13	16.11

Table 3 shows the distribution of exported products according to the Combined Nomenclature (CN), which distinguishes 98 chapters. As can be seen, approximately one third of exporters only trade one product. If we also consider firms that only export two products, that percentage raises to more than 50%. Again, this result is similar to Bernard *et al.* (2007), who obtain that the percentage of US export firms that only trade one product is 42%. Only 25% of the US exporters trade more than five products. The average number of exported products by firm is about four. However, that number has increased throughout the period: firms exported three products in average in 2000, while that number increased to 3.72 in 2010. The most frequently exported products correspond to *Machinery and mechanical appliances* and *Plastic and articles thereof*, which are exported by about 30.2% and 20.2% of firms in the sample, respectively (see Table A1 in Appendix for details). Only 7.9% of all exported products could be considered as high-tech products, according to the usual OECD classification. By the opposite, almost 60 % of exported products could be characterized as low or medium-low tech intensity.

Table 3: Distribution of exported products (defined at 2-digits CN)

	2000	2005	2010
Distribution of firms (%):			
1 chapter	39.24	29.15	34.27
2 chapters	22.26	18.29	21.31
3 chapters	13.00	13.12	12.76
4 chapters	7.25	9.19	8.06
5 chapters	4.77	6.89	5.07
6-10 chapters	10.29	15.39	11.94
11-25 chapters	2.92	7.23	5.85
> 25 chapters	0.28	0.73	0.73
Average # of chapters (per firm)	3.01	4.21	3.72
Total	7,506	7,921	5,743

In summary, the descriptive analysis confirms three basic features of the Spanish export firms. First, the firms use to export only a few products in a few markets. Second, the main destination countries are those integrated in the EU area (in particular, those which share border with Spain). Third, only a reduced percentage of the export products have a high tech intensity.

4. Econometric approach and results

Previous descriptive analysis suggests that, as expected, distance play a main role in explaining entry decisions in export markets. A standard way to deal with this question is by using a gravity equation, with distance and relative size of the import country as explanatory variables. However, this paper does not try to explain the cross-country pattern of Spanish exports, but to address the regional and industrial spillover effects associated to previous decisions. It implies that the analysis is focused on entry in new markets, so both decisions related to current presence (that is, decisions related to continuing or exiting the market) are excluded from the empirical analysis. In other words, we are interested in each entry decision (e_{ijct}) in a country *c* in time *t* taken by firm *i*, which belongs to the industry *j*, conditioned to the fact that such a firm was not exporting to that specific country *c* in *t-1*. More specifically,

$$p(e_{ijct} / e_{ijct-1} = 0) = \beta_0 + \beta_1 SpillR_{ict} + \beta_2 SpillI_{jct} + \beta_3 GDP_{ct} + \beta_4 Dist_c + \beta_5 Risk_{ct} + \beta_6 Size_{it} + \varepsilon_{ijct}$$

This implies a considerable reduction in the initial sample, additional to the drop in those observations corresponding to the first year for each firm, or the year after a blank in the data (remember an unbalanced panel is used). Additionally, we have dropped those countries in which the number of occurrences (that is, firms exporting to that country in a specific year) is lower than 20. It implies that the initial number of considered countries, that was equal to 242, is reduced to 206. The explanatory variables are as follows.

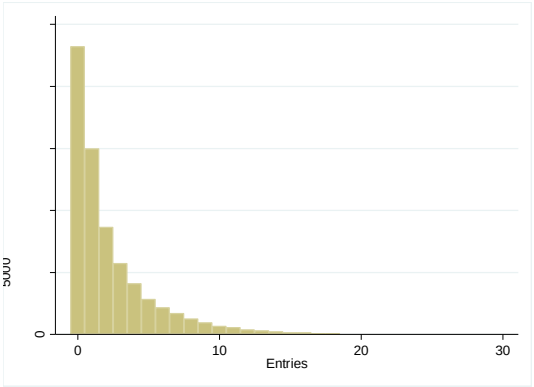
Firstly, a set of variables with geographical dimension: economic size (measured by *GDP* in purchasing power parity), distance (*Dist*) and the commercial risk (*Risk*) of the destination country. The GDP volume of the importing country has been extracted from the World Bank database, while bilateral distances between Spain and importing countries have been elaborated by using the Great Circle method. Additionally, a relevant indicator refers to country risk classification of the Participants to the Arrangement on Officially Supported Export Credits, elaborated by the OECD, which captures transfer and convertibility risk and cases of force majeure. This variable takes values between 0 and 7, where higher values point out higher non-payment risk by the debtor country. As expected, most of the OECD countries show a risk equal to 0. Another variable with geographical dimension is regional spillovers (*SpillR*). This variable takes value 1 in period t when the firm was exporting to a country that belongs to the same geographical area in period *t-1*, and 0 otherwise. Remember that the

sample is conditioned to decisions on new entries, so if *SpillR* takes values 0 means that the decision (at *t*) corresponds to a country in a geographical area in which the firm was not operating (at *t-1*). The geographical areas follow a continental classification which distinguishes nine large areas: North America, Central America, South America, Europe, other European countries, Africa, Middle East, Far East and Oceania (see Table A2 in Appendix for details).

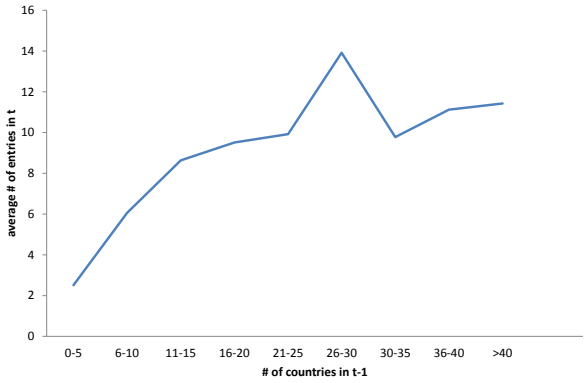
The second group of variables includes those with an industrial or firm dimension. First, the industrial spillover (*SpillI*) measures the number of exporting firms in the same industry *j* that exports to a country *c* in year *t*. This variable tries to capture the information externalities revealed by previous export activity of other similar firms. Finally, a firm level variable measure the number of employees (*Size*). The initial hypothesis is that size influences positively the entry in new export markets. With respect to the rest of explanatory variables, the expected signs for distance and risk are, as usual, negative, while GDP is expected to affect positively. Additionally, the effects for both spillover variables are expected to be positive.

Figure 2: Distribution of entries by year (all years)

a) # of annual entries in 2001-2010



b) Average # of entries by year t, conditioned on the number of market exporting at t-1



The total number of observations with complete data for all the variables is 10,174,052, which refer to 5,044 firms. Only 1.24% of them (i.e., 127,461 observations) correspond to entries. This low rate of occurrence for value 1 (entries) is the result from considering all potential decisions for each firm (in each year) in all those countries in which they are not operating. Figure 2(a) shows the distribution of entries for the whole period 2001-2010. As may be expected, the number of entries uses to be small. In average, a typical firm decides to enter in

2.25 markets per year. This average value is conditioned by the geographical diversification of previous presence in export markets. Figure 2(b) shows the average number of entries in *t* conditioned on the number of countries that firm exported in *t-1*. As can be seen, the average number of entries increases with the number of export markets in the previous year, though the positive relationship seems to be less intense once firms export to more than 20 countries.

Table 4: Entry decision model: probit and fixed effects logit

	Probit				Fixed effects logit
	1	2	3	4	5
GDP	0.0015*	0.0010*	0.0016*	0.0013*	0.0991*
	(78.58)	(45.02)	(104.62)	(74.12)	(20.06)
Dist	-0.0006*	-0.0002*	-0.001	0.0002*	-0.0005
	(-60.51)	(-24.20)	(-0.26)	(26.35)	(-0.16)
Risk	-0.0027*	-0.0021*	-0.0017*	-0.0013*	-0.1786*
	(-195.89)	(-130.15)	(-152.78)	(-99.50)	(-38.31)
Size	0.0004*	0.0002*	0.0002*	0.0001*	
	(6.80)	(4.02)	(4.84)	(2.65)	
SpillI		0.0001*		0.0001*	0.0012*
		(176.70)		(156.72)	(44.69)
SpillR			0.0218*	0.0216*	0.8913*
			(235.09)	(222.81)	(30.42)
# observations	7,432,800	6,529,275	7,282,202	6,529,255	417,810
Pseudo R^2	0,0601	0,0856	0.1157	0.1382	0.1313

Note: z-statistic between brackets. * indicates significant at 1%.

Table 4 shows the results (marginal effects) with probit and fixed effects logit estimations. The first column shows the classic results of the gravity equation, which captures the relationship between the entry decision in a country and distance to export countries and its GDP. As expected, distance has a negative effect on the probability of entry, while GDP shows a positive sign. Note that the latter coefficient may not be interpreted in the same way than usual gravity functions, in which GDP elasticity of the importer country is close to 1. The variable *Risk* also shows the expected sign, pointing out that the higher the risk of non-payment the lower the probability of entry in this country is. As expected, firm size also shows a positive and significant sign. In this way, larger firms are more prone to enter in new markets.[4]

[4] A *poisson* regression of the number of countries where firms exports each year (pooled) also shows a positive and significant effect for firm size.

The second column includes the variable related with industrial spillovers (*SpillI*). The results suggest that this variable has a positive effect on entry decisions. It indicates that firms deciding to enter in a new country take into account the evolution of other firms in the same industry that export in the same market. The rest of explanatory variables do not change with respect to previous estimation.

The third column adds the variable that measures geographical spillovers (*SpillR*). As can be seen, this variable has a positive effect on entry decisions, so that the previous export experience in countries in the same region makes easier current entry in other countries of the same area. Variables related with GDP, country risk and size do not change its sign. However, the inclusion of this variable varies the results significantly for distance. In particular, distance is non-significant when geographical spillovers are considered. It could be explained because of the geographical spillover capture the effect of that variable.

The fourth column shows the results of the estimation when all the explanatory variables are considered. As can be seen, GDP, country risk, size and the geographical and industrial spillovers have the expected sign and all of them are significant. However, distance has a positive and significant effect.

An interesting issue to be emphasized refers to not having considered panel characteristics of the dataset in previous estimations. Actually, there are two bi-dimensional features of firms's decisions that are potentially interesting: firms x years (for every country) and firms x country (for every year). Due to the purpose of this paper, that emphasizes differences in decisions among countries adopted by each firm, the second one is definitively the most relevant for us. If we concentrate our attention in a specific year, we can take advantage of multiple decisions taken by each firm to control for fixed-firm effects, that is, firm characteristics that are independent of the specific entry decision adopted by each firm in each market. This is the case for employment or any other firm-level variable. The advantage is that now estimators with cross-country dimension ($\theta = \beta_{1,\ldots}\beta_5$) are consistent even with the presence of observable or unobservable) fixed effects. This is a well-known technique to estimate panel data in a logistic specification with fixed effects, that was proposed by Chamberlain (1980). The rationale is to condition the observed events (entry or no entry) on a sufficient statistic which

cancels out the fixed elements in the conditioned likelihood function. This purpose is achieved by conditioning the observed pattern of entry decisions for a given firm in a set of N_i countries ($e_{i,c=1}, e_{i,c=2}, ..., e_{i,c=N_i}$) to the sum of its dependent variables (the amount of 'ones' for the N_i different decisions faced by the firm ($\sum_{c \in N_i} e_{ic}$).The inclusion of firms that decide not to enter in any market (or to enter in all countries, an event not observed ever) is irrelevant for the ML estimators. Therefore, the conditional logit excludes these firms from the sample to work with, without any other consequence.

The last column of Table 4 shows the results of the fixed effect logistic regression for the set of decisions that correspond to 2010. As can be seen, estimators related with GDP, risk, size and the geographical spillovers have the expected effect and all of them are significant. Therefore, entry decision in a determined country is affected by the latter variables when a fixed effect logistic regression is considered. As in the third column, distance is non-significant under this methodology.

5. Conclusions

This paper analyses entry decisions in new export markets by Spanish firms in the period 2000-2010. The study combines firm level data with industrial and country information. The main objective is to address those effects related to previous presence in other markets in the same geographical areas (*regional spillovers*) and, also, related to export activity in that market by other firms in the same industry (*industrial spillovers*). In a gravity equation framework, other variables concerning firm and country characteristics are also considered. This study is framed in the emerging literature about sequential entry as a mechanism to reduce sunk cost that firms face when they decide to enter in export markets.

The descriptive analysis confirms two important features of Spanish exporters: they export more frequently with closer countries and they export few products in few countries. The latter result is similar to the obtained in studies for other countries, and it points out the high trade concentration and potential improvement in terms of the extensive margins.

There are different ways to analyze empirically export decisions. In this paper, we estimate an entry equation by which a firm decides to enter in a specific new market. Therefore, persistence and exit decisions, which are both based on previous presence in that market, are not considered.

The results point out that distance and non-payment risk of export credits have a negative effect on market entry. By contrast, GDP of new markets and firm size affect positively the entry. Results also suggest a positive influence of industrial spillovers on entry probability. We argue that those are associated to information spillovers linked to decisions adopted by other firms. Similarly, results also indicate the positive influence of geographical spillovers. It suggests that previous export activity in other countries in the same region facilitates the entry in new markets located in the same area. However, the inclusion of this latter variable modifies some results. Particularly, distance is no longer significant and even is positive. Future research (in course) is required to deal with this issue.

Appendix: Descriptive and variable construction

Table A1: Most frequently exported products in 2010 (2 digits CN code)

	# of firms	%
Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof (84)	1,956	30.23
Plastics and articles thereof (39)	1,311	20.26
Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles (85)	1,269	19.61
Articles of iron or steel (73)	1,017	15.72
Printed books, newspapers, pictures and other products of the printing industry; manuscripts, typescripts and plans (49)	972	15.02
Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated nameplates and the like; prefabricated buildings (94)	870	13.45
Paper and paperboard; articles of paper pulp, of paper or of paperboard (48)	754	11.65
Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof (90)	697	10.77
Vehicles other than railway or tramway rolling stock, and parts and accessories thereof (87)	625	9.66

Geographical spillover

Firm *i* decides to export (1) or not (0) to country *c* at time *t*, conditioned to not exporting at *t-1* (e_{ict} /e_{ict-1} = 0). That country *c* belongs to a region R_c according to the classification showed in Table A2. Then, the geographical spillover for firm *i* in country *c* at time *t* considers whether or not the firm was exporting to other country in the same region R_c at time *t-1*. Due to the sample is conditioned to entering in *c*, that country is not accounted in the set of countries in R_c at time *t-1*.

Industrial spillover

The database provides information on goods exported by each firm, classified in 99 groups of products according to the Combined Nomenclature. That information corresponds to firm's exports as a whole, and it is not crossed for each export destination. Therefore, we assume that each firm exports the same bunch of products to all export destinations. The industrial spillover for a firm *i* exporting to country *c* at time *t* computes the number of firms that were exporting similar products to the country *c* at time *t-1*. Therefore, the procedure is as follows. Firstly, for each firm *i* that belongs to the subsample of firms exporting to a country *c* at time *t*, we calculate the number of firms in that subsample that export any of the products exported by the firm at time *t-1* (b). Secondly, the industrial spillover is computed as the difference between that number and the total number of goods produced by the firm (a). Next table shows an example for five firms (in a specific country and year).

	Products				# of firms in each product							
Firms in country c at time t	P1	P2	P3	Total # of products (a)	ds1	ds2	ds3	ds4	ds5	ds6	Total # of firms (b)	Spill-Industry (a – b)
1	2	3	5	3	0	2	2	0	3	0	7	4
2	3	5	6	3	0	0	2	0	3	1	6	3
3	1	2	.	2	1	2	0	0	0	0	3	1
4	4	.	.	1	0	0	0	2	0	0	2	1
5	4	5	.	2	0	0	0	2	3	0	5	3

When the firm is not exporting to country *c*, the industrial spillover is defined as b (not as a-b) and it captures the number of firms exporting at least one of the products to the same country/year.

Table A2: Country classification by geographical areas

Country	Region	Country	Region
Afghanistan	Middle East	Latvia	Europe
Albania	Other European countries	Lebanon	Middle East
Algeria	Africa	Lesotho	Africa
Angola	Africa	Liberia	Africa
Antigua and Barbuda	Central America	Libya	Africa
Argentina	South America	Lithuania	Europe
Armenia	Middle East	Luxembourg	Europe
Australia	Oceania	Madagascar	Africa
Austria	Europe	Malawi	Africa
Azerbaijan	Middle East	Malaysia	Far East
Bahamas	Central America	Maldives	Far East
Bahrain	Middle East	Mali	Africa
Bangladesh	Far East	Malta	Europe
Barbados	Central America	Mauritania	Africa
Belarus	Other European countries	Mauritius	Africa
Belgium	Europe	Mexico	North America
Belize	Central America	Moldova	Other European countries
Benin	Africa	Mongolia	Far East
Bhutan	Far East	Montenegro	Other European countries
Bolivia	South America	Morocco	Africa
Bosnia and Herzegovina	Other European countries	Mozambique	Africa
Botswana	Africa	Myanmar	Far East
Brazil	South America	Namibia	Africa
Brunei Darussalam	Far East	Nepal	Far East
Bulgaria	Europe	Netherlands	Europe
Burkina Faso	Africa	New Zealand	Oceania
Burundi	Africa	Nicaragua	Central America
Cambodia	Far East	Niger	Africa
Cameroon	Africa	Nigeria	Africa
Canada	North America	Norway	Europe
Cape Verde	Africa	Oman	Middle East
Central African Republic	Africa	Pakistan	Middle East
Chad	Africa	Panama	Central America
Chile	South America	Papua New Guinea	Far East
China	Far East	Paraguay	South America
Colombia	South America	Peru	South America
Comoros	Africa	Philippines	Far East
Congo, Dem Rep.	Africa	Poland	Europe
Congo, Rep.	Africa	Portugal	Europe
Costa Rica	Central America	Qatar	Middle East
Côte d'Ivoire	Africa	Romania	Europe
Croatia	Other European countries	Russia Federation	Other European countries
Cyprus	Other European countries	Rwanda	Africa
Czech Republic	Europe	Samoa	Oceania
Denmark	Europe	São Tomé and Príncipe	Africa
Djibouti	Africa	Saudi Arabia	Middle East

Dominica	Central America	Senegal	Africa
Dominican Republic	Central America	Serbia	Other European countries
Ecuador	South America	Seychelles	Africa
Egypt	Africa	Sierra Leone	Africa
El Salvador	Central America	Singapore	Far East
Equatorial Guinea	Africa	Slovak Republic	Europe
Eritrea	Africa	Slovenia	Europe
Estonia	Europe	Solomon Islands	Oceania
Ethiopia	Africa	South Africa	Africa
Fiji	Oceania	South Korea	Far East
Finland	Europe	Sri Lanka	Far East
Former Yugoslav Republic of Macedonia (FYROM)	Other European countries	St. Kitts-Nevis	Central America
France	Europe	St. Lucia	Central America
Gabon	Africa	St. Vincent and Grenadines	Central America
Gambia	Africa	Sudan	Africa
Georgia	Other European countries	Suriname	South America
Germany	Europe	Swaziland	Africa
Ghana	Africa	Sweden	Europe
Greece	Europe	Switzerland	Europe
Grenada	Central America	Syria	Middle East
Guatemala	Central America	Taiwan	Far East
Guinea	Africa	Tajikistan	Middle East
Guinea-Bissau	Africa	Tanzania	Africa
Guyana	South America	Thailand	Far East
Haiti	Central America	Timor-Leste	Fast East
Honduras	Central America	Togo	Africa
Hong Kong, China	Far East	Tonga	Oceania
Hungary	Europe	Trinidad and Tobago	Central America
Iceland	Europe	Tunisia	Africa
India	Far East	Turkey	Other European countries
Indonesia	Far East	Turkmenistan	Middle East
Iran	Middle East	Uganda	Africa
Iraq	Middle East	Ukraine	Other European countries
Ireland	Europe	United Arab Emirates	Middle East
Israel	Middle East	United Kingdom	Europe
Italy	Europe	United States	North America
Jamaica	Central America	Uruguay	South America
Japan	Far East	Uzbekistan	Middle East
Jordan	Middle East	Vanuatu	Oceania
Kazakhstan	Middle East	Venezuela	South America
Kenya	Africa	Vietnam	Far East
Kiribati	Oceania	Yemen	Middle East
Kuwait	Middle East	Zambia	Africa
Kyrgyz Republic	Middle East	Zimbabwe	Africa
Laos	Far East		

Table A3: Descriptive statistics of the explanatory variables

Variable	Name	Mean	Std. Deviation	Min	Max
GDP (Billions $, in PPP)	*PIB*	0.2731	1.02	0.0001	13.14
Country Risk	*Risk*	4.71	2.50	0	7
Distance (km.)	*Dist*	6,162.47	3,822.4	502.7	19,839.6
Number of employees	*Size*	82.26	499.5	1	25,308
Industrial spillover	*SpillI*	211.24	442.91	0	14,477
Regional spillover	*SpillR*	0.32	0.47	0	1

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