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Title

Do sunk exporting costs differ among markets? Evidence from Spanish manufacturing firms.[1]

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Abstract

In this paper, we test the hypothesis of sunk exporting costs differing among markets. We use a sample of Spanish firms from Encuesta sobre Estrategias Empresariales (ESEE) for period 1991-2002. Our results confirm the importance of those sunk costs and demonstrate that they differ depending on the market they export to. Although most of the firms exports to developed markets, the costs to enter (and "to re-enter") are greater in those markets.

Key Words: Sunk costs, heterogeneity of firms, Regionalism.

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0. Introduction

To entry in a foreign market, firms have to adapt their products to foreign demand and technical and administrative standards and find distribution networks. Sunk exporting costs are usually presented as a consequence of imperfect information and informal or formal barriers that separate domestic and foreign markets. Literature on border effect and gravity equation gives an idea of the importance of these hidden barriers, often seen as the better candidates to explain the "mystery of the missing trade"[6] (Trefler, 1995).

Our contribution is twofold: first, we test whether sunk costs differ from one market to another, a hypothesis that has not been tested by micro-level studies. Secondly, we test whether experience in one market has the same influence on the probability to export to this market as an experience in other market. We use a panel data probit model to study the export behaviour of a sample of Spanish manufacturing firms continuously operating from 1991 to 2002.

The fact that exporters are generally more productive than non-exporters is commonly justified by the existence of sunk costs, see Melitz (2003) for a theoretical justification of this self-selection effect. Roberts and Tybout (1997) derive an empirical model, using data from Colombia, and find evidence in favour of the *hypothesis of sunk exporting costs*: a firm incurs in a cost for entering (re-entering) in a market, then a firm exports only if their expected gross profit is positive and its current export status depends on its past experience. Bernard and Jensen (2004) obtain similar conclusions with a panel of manufacturing companies of the U.S.A. for period 1984-1992. Campa (2004) uses a sample of Spanish manufacturing firms and finds sunk costs hysteresis to be an important determinant of export market participation.

Mañez et al. (2005) find that sunk costs, labour productivity, size of the firms, R&D intensity, unobserved characteristics of products and correlations in exogenous shocks influence firms' participation in exports market. Esteve et al. (2001) find that survival rate at exporting is positively correlated with the export intensity. Furthermore, firms exporting to closest markets export a longer time. Barrios et al. (2001) show that R&D activities exert a determinant effect on the exporting decision and on the intensity, for national and foreign firms, moreover when exporting to EU and OECD. Finally, Fariñas and Martin-Marcos (2007) show that exporters exhibit greater economic performance and they do self-select. In particular, firms selling a higher share of their exports in OECD markets have greater productivity than firms that mainly export to the Rest of the World (ROW).

This paper is organised as follows. In Section 1, we present the empirical model. In Section 2, we describe the data set. Our findings are explained in Section 3. Section 4 concludes.

1.- Empirical Model

We closely follow Roberts and Tybout's (1997) approach to model a multi-period export decision for entry and exit with sunk costs. They consider that in each period, a firm decides to export if the increment to the expected gross profits associated with exporting is positive. Following related literature, a reduce form of the dynamic model is estimated. We assume that the expected gross profits depend on exogenous firm characteristics (X_{it}), macro conditions (μ_t) and past exports. Let us define I_{it}^k an indicator function that takes value 1 if firm i exported to k in year t. Because the fixed cost is not observed, we include the lagged export status in the explanatory variables[7]. Firm's characteristics and macro-conditions are assumed observable to the firm in the period. Therefore the equation for the decision to export is

$$I_{it}^k = \begin{cases} 1 & if \ 0 \le \mu_t + \beta X_{it} + \sum_k \sum_{h=1}^{H} \gamma^h I_{it-h}^k + \varepsilon_{it}^k \\ 0 & otherwise \end{cases} \tag{1}$$

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[6] This expression describes the fact that trade is larger than predicts by demand- supply analysis. Then it is partly explained by common language, presence of bilateral agreements, cultural proximity.
[7] We follow Roberts and Tybout (1997) and Bernard and Jensen (2004).

where ε_{it}^{k} is an error term and *k=(ALL, EU, OECD, ROW)*. The vector X_{it} is a set of characteristics of the firm that includes: the age of the firm in logarithm (*lage*); the size of the firm in logarithm terms (*lsize*); a dummy that takes value 1 if more than 25% of its capital is owned by foreigners (*FORCA*P); a variable to measure the firm's labour productivity in logarithm terms (*lprod*); a variable to measure the R&D intensity in logarithm terms (*lrdi*); a dummy that takes value 1 if the firm receives any subvention for R&D (*SUBRD*) and a set of dummies for year and sector.

We expect the lagged export status to affect the export-decision positively when explaining the export in general. The inclusion of time-specific effects pursues to capture macro-level changes in export conditions like temporal variations in export profitability, start-up costs that are common across firms, the influence of business cycle, credit-market conditions, aggregate exchange rate movements, trade-policy conditions, overall changes in demand for Spanish exports and other time-varying factors. The industry dummies control for unobservable market characteristics where firms compete, being proxies of market concentration, use of technology or firms behaviour by industry.

The parameter γ_{i} reflect the role of sunk costs in the decision to export. If significant, these coefficients should be interpreted as the rate of depreciation of export market experience and accumulated knowledge in foreign markets on the exporting likelihood.

2.- Data

The Encuesta sobre Estrategias Empresariales (ESEE) is an annual representative survey of Spanish manufacturing firms classified by industrial sector[8] and size categories[9]. The ESEE includes variables relative to the structural characteristics of the company, information on the volume of exports and imports and its disagregation for three regions: OECD countries, EU, and ROW[10]. .

We use a panel of continuously operating firms from 1991 to 2002[11]. We end up with a balanced panel of 756 firms. Note that the period is larger than in most studies studying sunk costs, especially for Spain. Sample representativeness is very close to the complete sample from the ESEE. This is true especially for relevant variables like the probability of being an exporter/non-exporter and the share of exporting firms in total sales.

Table 1 presents some firms' relevant characteristics by export market[12]. The main destination of Spanish exports is the EU(15). This pattern is more striking for exports value than for the number of exporting firms. The share of exports on sales, productivity and the presence of foreign capital is larger for those firms that export to the EU exclusively or at the same time to any of the others destinations. We do not observe the same for advertisement intensity and R&D intensity, larger for firms that export to the ROW/OECD in 1991/2002.

3. Econometric results

We estimate the model considering the export to four sets of countries: ALL, EU, ROW, and OECD. We consider the past experience (three-lagged value of export status) in each of these markets. Results are reported in Table 2. Dummies for years and sectors are included, but dropped from tables from simplicity, they are generally significant.

Considering firm's characteristics, we find that the eldest and largest firms display higher probability of exporting. This result is consistent with the hypothesis of increasing returns and with other empirical studies. Technological framework and innovation process are also important features for exports. The intensity in R&D expenditure does have a significant and positive effect in all cases. Firms that benefited from R&D subvention also have a greater probability of exporting in general. However, it does not matter when a specific market is considered.

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[8] NACE-93 classification.

[9] Participation rate to the survey is about 70% for firms with more than 200 employees. Firms that employed between 10 to 200 were randomly sampled by industry and size strata holding around a 5% of the population.

[10] Since 2000, the disagregation includes Latin America and Asia. We cannot take it into account here because the period is very short.

[11] We correct problems from nonreporting or misreporting, dropping observations for the year 1990 (too incomplete) and those non-reported or non-answered. While in 1991, there are 2359 firms, in 2002 increase up to 3462. Since some firms have disappeared, the number of answers is lower in all years.

[12] Since it could be the case that a firm exports to more that one market per year, the total number of firms is larger than that of the sample.

More striking results are found concerning productivity and ownership. The productivity has a positive and significant effect in all cases except OECD case, which is positive but not significant. These results are the expected from the Melitz model and confirm a presence of self-selection effect in the export market. A higher foreign participation increases the probability of exporting to developed markets (EU and OECD) but does not matter for others destinations.

Regardless the destination, we find that there is a significant difference between the re-entry cost of a firm that has exported three years ago and a firm that never exported. Besides coefficients for the experience at exporting to OECD and ROW have a greater impact on current export status.

Focusing on the probability to export to the EU, ROW or OECD, sunk costs clearly differ among markets since the experience as an exporter to the ROW is not relevant for exporting to the EU and less important for the probability to export to the OECD. In the same way, have been previously exporting to the EU does not increase the probability of exporting to the ROW.

4. Conclusions

Summarizing, this paper shows that the costs to enter (and "to re-enter") are greater in developed markets than in those of the ROW. Moreover, we find that a previous experience in the EU market (respectively the ROW) increases both the probability of exporting to the OECD and to the same market but is not relevant for the ROW (respectively for the EU). OECD countries (non-EU) appear as an intermediate case. European norms may be very specific and homogeneous among members countries whereas the difficulties or norms in other OECD imply different type of organisation that are easily used to perform in other market.

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Table 1.- Firms characteristics by export market (continuous sample).

	Share in firms	Share in exports	R&D-Intensity	Adver-Intensity	Added Value by employee	Foreign Capital > 25%	Exports/Sales
1991							
EU	13.35	5.96	0.51	4.19%	6128	38.18	11.78
OECD	0.00	----	----	----	----	----	----
ROW	4.61	0.10	0.50	7.41	6239	15.79	1.39
EU & OECD	10.44	16.19	0.72	1.44	5468	44.19	27.08
EU & ROW	18.93	5.45	0.99	1.79	5274	26.92	10.27
OECD & ROW	1.46	0.01	0.68	0.45	3457	0.00	0.07
EU, OECD & ROW	51.21	72.29	1.90	2.36	5542	33.65	25.79
Non-exporters	----	0.00	1.16	1.63	5474	4.69	----
	100.00	100.00					
2002							
EU	21.33	11.03	0.47	3.01	8155	20.18	28.47
OECD	1.17	0.50	4.66	7.76	4535	33.33	12.26
ROW	3.52	0.08	0.17	5.23	6501	5.56	3.62
EU & OECD	10.96	14.56	0.55	3.50	8594	35.71	31.80
EU & ROW	18.20	10.88	0.70	2.63	9119	32.26	20.38
OECD & ROW	0.39	0.00	0.00	0.44	2062	0.00	4.92
EU, OECD & ROW	44.42	62.95	2.43	2.75	7690	36.12	40.04
Non-exporters	----	0.00	0.42	4.65	6366	2.05	----
	100.00	100.00					

Table 2.- Probability of Exporting

	I_t^{ALL}	I_t^{UE}	I_t^{OECD}	I_t^{ROW}
I_{t-3}^{UE}	0.218**	0.478***	0.305**	-0.200**
	[0.133]	[0.102]	[0.123]	[0.087]
I_{t-3}^{OECD}	0.561***	0.380***	0.793***	0.250***
	[0.095]	[0.130]	[0.092]	[0.089]
I_{t-3}^{ROW}	0.546***	-0.166	0.166*	0.390***
	[0.097]	[0.101]	[0.098]	[0.073]
lage	0.301***	0.426***	0.271***	0.185**
	[0.078]	[0.080]	[0.080]	[0.074]
lsize	0.815***	0.826***	0.884***	0.694***
	[0.056]	[0.054]	[0.059]	[0.051]
FORCAP	0.063	0.707***	0.305**	0.014
	[0.121]	[0.163]	[0.129]	[0.122]
lprod	0.204***	0.298***	0.041	0.268***
	[0.072]	[0.070]	[0.071]	[0.058]
lrdi	0.022**	0.052***	0.029***	0.027***
	[0.009]	[0.011]	[0.009]	[0.008]
Subrd	0.236**	-0.105	0.135	0.020
	[0.102]	[0.135]	[0.108]	[0.103]
Constant	-6.348***	-5.631***	-4.632***	-5.311***
	[0.821]	[0.773]	[0.849]	[0.682]
Obs.	8972	8972	8969	8964
# firms	756	756	756	756

Stand. dev in brackets * significant at 10%, **at 5%; ***at 1%

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