

MANUFACTURING FIRMS' EXPORT ACTIVITY: BUSINESS AND FINANCIAL CYCLES OVERLAPS!

Abstract

This paper models how the business and financial cycles interact in firms' export activity. Specifically, we study the influence of macroeconomic variables on the decision to export and on the volume of exports, being controlled by firms' characteristics. A distinction is made between the firms' export activity in reaction to increases in external demand after improvements in national competitiveness, and firms' exporting in response to a reduction in aggregate internal demand. The decision to export depends positively on the countries' competitiveness variables, and the volume of exports also depends positively on national competitiveness and negatively on growth of internal demand. We also find a positive influence of the leverage of the economy on extensive and intensive export activity. Our results suggest that the financial cycle overlaps with the business cycle in influencing firm export activity decisions.

Keywords: Exports; industrial and manufacturing; macroeconomics; competitive advantage; internal demand; credit cycle.

JEL: C23, C24, D22, F14, F41, F44

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1. Introduction

During the Great Recession, many countries relied on increasing exports as a way of speeding the recovery of national production and employment. Firms make export decisions balancing private benefits and costs of selling abroad. Public policies can influence the net pay-off of exporting by improving national competitiveness through currency devaluations, price inflation controls and lowering production costs, such as labour costs. If these policies succeed in their final goal, goods produced in the country can sell at lower prices in foreign markets (becoming more competitive) and firms still make profits in their sales abroad. However, cost-reducing policies to increase external competitiveness, for example internal devaluation by lowering salaries, may have negative effects on internal aggregate demand. Firms did realize that their sales in the domestic market went down and viewed the export decision not as a response to higher external demand from improvements in national competitiveness, but as a way of occupying idle capacity after a fall in domestic demand.

If policies aimed at increasing external competitiveness have a negative side effect by depressing internal demand, the export activity may not be able to turn around the growth of the economy during a recession; this will occur when the increase in export, in response to the increase in external demand, does not compensate the contraction in internal demand. The policies and strategies for a demand-led recovery can then be much less successful than expected, as some research has documented (di Mauro and Forster, 2008; Dieppe et al., 2012; Fagan, Henry and Mestre, 2005; Esteves and Rua, 2015; European Commission 2010). The time evolution of external competitiveness indicators can then be insufficient to capture the effects of macroeconomic conditions on the aggregate volume of exports of the economy. Moreover, in order to properly attribute either to one explanation or to the other (competitiveness or aggregate internal demand) the behaviour of exports along the time, it is

necessary to model exports as a function of both, competitiveness and internal demand variables (Bobeica, Esteves, Rua, and Staehr, 2016; Christodouloupoulou and Tkačevs, 2016; C'Zorzi and Schnatz, 2010; Esteves and Rua, 2015).

This paper empirically examines the combined effect of external competitiveness and growth in internal demand on the export activity of Spanish manufacturing firms along the period 1996-2013.

Spain is a founding member of the Euro zone as well as one of the countries that suffered quite deeply a negative shock as a consequence of the financial crisis in 2008. The panel data includes three time sub-periods with sufficient variability among them, to make the empirical analysis particularly relevant: the Euro preparation years of 1996-1999; the first years of the Euro, a period of economic expansion, 2000-2008; and the final five years period of the Great Recession, 2008-2013. The data unit is a manufacturing firm that either exports or not and, if it does it, reports the volume of exports of the corresponding year. The data allow for testing the effect of competitiveness and domestic demand on the export activity of manufacturing firms, being controlled by firm level variables, which have been seen as relevant in explaining export activity. All the above referenced papers on competitiveness and domestic demand, as determinants of export activity, use aggregate country level time series data so they do not separate between effects on intensive and extensive export activity, neither they control for heterogeneity among firms in the estimation of macroeconomic effects.

Euro membership softened the external financial constraint of the Spanish economy and during the years 2000-2008 this economy accumulated foreign private debt at levels not seen before. Previous research (Bellone, Musso, Nesta and Schiavo, 2010; Campa and Shaver, 2002; Greenaway, Guariglia and Kneller, 2007) has examined the influence of financial conditions of firms in their export decisions. However, nothing is known as to whether the credit cycle-bank loans- affects the export decisions of firms or not. It can be expected that, with similar financial

structure, firms will be less constrained to access to external funds (bank loans for example) to finance exporting-oriented projects in periods of financial expansion than in periods of financial contraction. The financial cycle of the Spanish economy in the years under study, is measured by the ratio of corporate debt over GDP. Therefore we should expect a positive effect of this variable on both, extensive and intensive, export activities.

We use firm level data because they have two important advantages. First, they can explain separately the decision to export and the volume of exports. Second, the use of firm level data has the additional advantage that in the estimation of the macroeconomic effects, the overlap of business and financial cycles, it is possible to control by and estimate firms' idiosyncratic effects on export decisions.

We find that macroeconomic variables affect differently the probability that one firm exports in a particular year and the volume of exports for those ones that decide to export, except for the macroeconomic financial conditions variable which affects positively the two export decisions. In particular we find that the indicators of external competitiveness of the Spanish economy influence both the intensive and the extensive measure of export activity, with the expected sign. As the Spanish economy becomes more externally competitive the probability that a firm exports increases and so the volume of exports per exporter. On the other hand, lower growth in domestic demand increases the volume of exports per exporter but does not affect the decision to export. We interpret these results as an evidence that Spanish manufacturers perceive that the gains in competitiveness are higher and more permanent than the decrease in internal demand. So lower domestic demand alone does not compensate for the costs of starting to export, while it does for those who already are exporters, who only have to decide on how much to increase the volume of output exported.

The rest of the paper is organized as follows. Section 2 formulates the empirical model and details the description of the sample and the variables used. Section 3 analyses the empirical

results obtained. Finally, Section 4 presents the conclusions, the implications of the findings and points to some limitations of the research.

2. The macroeconomic determinants of firms' export activity: conceptual considerations.

The literature on determinants of export decisions by firms distinguishes between micro or firm level variables, which affect the cost benefit analysis of becoming an exporter and, if so, how much to export (Bernard and Jensen, 1995; Fabling and Sanderson, 2013; Greenaway et al., 2007; Roberts and Tybout, 1997), and variables common to all firms (from the same market, industry or economy) that can affect each firm individually in a similar or in a different manner (Bobeica et al., 2016; Christodouloupoulou and Tkačevs, 2016; Esteves and Rua, 2015).

The goal of this study is to examine the determinants of the decision to export and the export intensity of manufacturing firms in Spain using firm-level data, with special attention to how firms' export decisions respond to the time changes in domestic demand, foreign competitiveness and the credit cycle.

Public policies intended to increase external competitiveness of products or services produced in country A often rely on currency devaluation and/or internal devaluation, as a way of reducing the price at which such products or services can be sold abroad. The implicit assumption is that the lower prices in national currency of country B of goods and services exported from country A, will increase the demand for these products and exporters will increase their sales to external markets in order to service the higher demand. However, for a profit maximizing firm, the decision to export and sell at a lower destination market price will depend on the resulting profits. Among the possible conditions, at least in the short run, for a firm in country A exporting to country B, could be that the firm has idle capacity and the marginal cost of using this one is lower than the selling price.

Under stationary competitive industry equilibrium the use of installed capacity of firms

in the domestic market will be mainly determined by shocks on the aggregate domestic demand, affecting all firms or at least all firms in the same industry or market. Consider a situation where domestic demand experiences a negative shock so demand falls for all firms in the country. For national firms that are already exporting, the decision to increase exports-directed production as a way of compensating for the fall in internal demand, and maintaining the utilization of the existing capacity, will be based on the comparison between incremental costs of selling abroad and the reduction in selling price. If the exporting firm is a price taker in the foreign market and the market price is higher than the assumed constant marginal production cost, the volume of exports will just be equal to the difference between installed capacity and domestic demand.

If the firm that experiences the fall in domestic demand is a non-exporter, then the decision to export as a way to use idle capacity is more complex because the decision to become an exporter implies, on one hand, running up fixed and sunk costs, such as creation of an export channel, building relationships with foreign customers and so on (Bernard and Jensen, 1995; Roberts and Tybout, 1997). The decision to build this infrastructure, or pay for using an existing one and then start exporting, will require that the difference between the price in the destination market and the marginal cost of producing and selling, times the units sold abroad, in present value will be at least equal to the costs of becoming an exporter and keeping the necessary infrastructure. The possibility that a non-exporter prefers to keep the capacity idle in order to become an exporter is a real one.

On the other hand, whether the firm decides to be an exporter or not will depend on idiosyncratic characteristics that determine the cost or value competitive advantage for average external domestic and international macroeconomic conditions over one or several business cycles. Since the publication of the seminal works by Bernard and Jensen (1995), and Roberts and Tybout (1997), many papers have examined the export activity of an economy using firm level data. Different empirical papers relate the financial health of companies to export decisions (Campa and Snaver, 2002; Greenaway et al., 2007; Bellone et al., 2010). Other

analyses relate firms' productivity dynamics with their decisions to serve overseas markets through exports and/or foreign direct investment (Melitz, 2003; Girma et al., 2004; Greenaway and Keller, 2007; Wagner, 2007, 2008; Fabling and Sanderson, 2013). In some cases it has also been included some environmental conditions, such as exchange rates and trade policy, which includes subsidies, upgrading, or technology enhancements (Bernard and Jensen 2004; Campa, 2004). Finally, theory and existing empirical work suggest that superior R&D capability leads firms to export. In other words, the most innovative firms, those with differentiated products and using cutting-edge technology, become exporters (Grossman and Helpman, 1995; Bleaney and Wakelin, 2002; Barrios et al., 2003; Aw et al., 2007; Girma et al., 2008).

Variations in aggregate demand over time, in the end, are unlikely to modify the structural decision of being a non-exporter when the idiosyncratic characteristics dictate. If internal demand falls, the sunk costs of entry in foreign markets act as an entry barrier. Firms for whom the idiosyncratic characteristics make them exporters will have to respond to positive and negative domestic demand shocks. If domestic demand increases, the exporter may not respond to the higher demand by reducing exports because, in the long run, it is more profitable to keep intact the already built export structure than damage it by reducing exports: the sunk costs act as a barrier to exit as an exporter. On the other hand, if the domestic demand falls, the exporter will likely respond with an increase in exports as long as the marginal cost of occupying the idle capacity is not too high.

These arguments suggest that controlling by the idiosyncratic characteristics of firms, that determine the long run profitability of entering into exporting, could be independent of the dynamics on domestic aggregated demand. Among firms that choose to export, the volume of exports would be inversely related to the dynamics of domestic demand growth.

Let us look at the response of domestic firms, regarding to their exporting activity, when faced with increases in foreign demand of their products resulting from changes in the country's

external competitiveness. One could expect that a depreciation of real exchange rate, which implies an increase in the economy's competitiveness, should rise the probability firm starts into exporting (Bernard and Jensen 2004; Campa, 2004), and the already exporting firms probably will increase their exports. In the face of both, shrinking domestic demand and increased external competitiveness, it could make it easier for firms to enter into the export markets.

Let us suppose that external competitiveness induces an increase in external demand. A domestic firm that already exports will have to decide between reducing sales in the domestic market and increasing sales abroad, ignoring the increase in external demand, or, alternatively, implementing an international expansion growth strategy (Barkema and Vermeulen, 1998; Luo and Tung, 2007; Datta, Liang, and Musteen, 2009). The profit maximizing decision will be to increase exports, if the difference from the selling price in the foreign market and in the domestic market compensates the marginal incremental costs of exports. Otherwise, the choice will be to maintain the current mix between sales in domestic and foreign markets. If the increase in foreign demand coincides with a period of depressed domestic demand, the decision is likely to be different because the opportunity cost of increasing sales abroad, in terms of reducing sales in the domestic market, is zero. Therefore, in this situation of excess capacity if external demand increases exporters will increase their sales abroad as well.

For those firms that are not exporting when external demand of domestic products increases, the response is likely to vary depending on the particular circumstances of firms. For example, if a firm is an occasional exporter and the current situation of selling only in the domestic market can be changed at not substantial sunk cost, the decision to export or not, if external demand increases, will be made in terms similar to those discussed above for the exporting firm. For the firms whose idiosyncratic conditions had led them to be non-exporters, the increase in external demand may justify changing the non-exporter status and becoming an exporter. This will happen if the increase in demand is expected to last long enough, so that the

incremental present value of profits from export markets are at least equal to the sunk entry costs of becoming an exporter. How many firms will perceive the increase in external demand from improvements in sustained national competitiveness enough to make the decision to become an exporter a profitable one, is difficult to tell and it will have to be determined empirically case by case (country by country).

Summing-up, the behavior expected of a firm entering into export activities to an increase in external competitiveness would depend on its past performances (occasional exporters or permanent non-exporters) and foreign volume demand. Exporting firms would increase exports when increase competitiveness.

Finally, we incorporate the financial cycle in our analysis. Different papers link access to external financial resources and the existence of financial constraints at firm level with the probability of exporting (Bellone et al., 2010; Minetti and Zhu, 2011). However, to our knowledge, no studies determine how the leverage cycles of an economy as a whole affect the probability of a firm exporting. Previous studies look for sensitivity of business investment with respect to the monetary conditions of the economy and the stage of the business cycle - expansion or contraction (Korajczyk and Levy 2003; Levy and Hennessy 2007). However, it is also necessary to incorporate how macroeconomic conditions influence the supply side of financial markets. Under Minsky's Financial Instability Hypothesis (1992), higher leverage ratio of non-financial corporations (a proxy of lax monetary and financial conditions) could have a positive effect on the likelihood of exporting and/or on the intensity of exports. This fact may imply that firms would rely, proportionally, more on external debt finance to finance the investments needed to enter to exporting and to keep doing it.

We are going to incorporate into our analysis the total indebtedness of Spanish non-financial firms in order to capture the process of borrowing over the economic cycle. The idea is to analyse whether the bank credit cycle affects or not, both the probability of a Spanish

manufacturing firm exporting and the export intensity of exporters.

The export activity of the economy is the outcome of aggregating the export decisions of firms. Changes over time in macroeconomic variables, such as the evolution of domestic aggregate demand and of external competitiveness, will affect differently the export decisions of firms which are already exporters, and of firms who are not exporters at the time of the change. Since being an exporter or not depends mainly on idiosyncratic characteristics of firms, for the correct evaluation of the sensitivity of exports to macroeconomic variables it will be necessary to control through the characteristics that determine whether a firm decides to be an exporter or not.

3. Methods and data

The goal of this study is to examine the determinants of the decision to export and the export intensity of manufacturing firms in Spain using firm-level data, with special attention to how firms' export decisions respond to the time changes on domestic demand, foreign competitiveness and financial cycle. The methods will integrate, on one hand, the decision to export and, on the other hand, the volume of exports of the exporters.

3.1. Probit model for decision to export

The binary probit model for exporting decisions (y_{it}) is written as:

$$y_{it} = 1[x_{it}\beta + w_t\gamma + a_i + u_{it} > 0] \quad (1)$$

where $i = 1, \dots, n$ are firms, $t = 1, \dots, T$ are time periods and $1[\cdot]$ is the indicator function, which denotes value one when firm i exports at time t and zero otherwise; x_{it} are a set of variables on firm characteristics related with structural, strategy, resources and productivity, and financial variables; w_t is a vector of macroeconomic variables, including business and credit cycle and competitiveness; a_i are unobserved time invariant characteristics of firms (managerial ability, foreign experience, etc.) and u_{it} is the error term.

The firm specific and unobserved characteristics in equation (1) may either be uncorrelated with the other explanatory variables or correlated with them. In the first case, the random-effects panel probit method estimation provides unbiased estimates of the coefficients, but when the unobserved effects are correlated with the explanatory variables then the correct estimation method is the fixed-effects panel probit method.

3.2. Heckman model for export intensity

The selectivity issue in econometric models on volumes of exports arises because these volumes are observed only for those firms that choose to export. Semykina and Wooldridge (2010) propose estimating the full model as the following system of two equations:

$$y_{it2} = x_{it}\beta_1 + w_t\gamma + \eta_1 + \bar{z}_t\zeta_1 + a_{i1} + u_{it1} \quad (2)$$

$$y_{it1} = 1[z_{it}\delta_2 + \eta_2 + \bar{z}_t\zeta_2 + a_{i2} + u_{it2} > 0] \quad (3)$$

The dependent variable (y_{it2}) is the logarithm of the export value of firm i in year t and it is only selectively observed when the latent participation decision is positive (Equation (3)).

The system includes different sets of explanatory variables. In export equation (2), we introduce exogenous explanatory variables linked with structural, strategy, resources and productivity, and financial variables (x_{it}) as well as macroeconomic variables (w_t), with β_1 and γ the corresponding vector of parameters. In participation equation (3), z_{it} is a vector of strictly exogenous variables that can be observed regardless of whether individual i is active in the export market or not, with δ_2 the corresponding vector of parameters. Semykina and Wooldridge (2010) propose an estimation method that following Mundlak (1978) and Chamberlain (1980), decomposes the unobserved individual effects into a systematic part linearly dependent on \bar{z}_t (which are time averages or initial levels of the exogenous variables in z_{it} – the so-called Mundlak terms) and an unexplained remaining term independent of z_{it} (a_{i1} and a_{i2}).

Participation equation (3) is estimated as a series of cross-sectional probit models; in each of them we calculate the inverse Mills' ratios (IMRs) of the corresponding time period for each firm. Then, for the selected sample of firms, Equation (2) is estimated using fixed effects with the IMRs added. The explanatory variables included in the selection equation presumably affect the probability of being in the selected sample but are assumed not to affect the export rate. Time-constant Mundlak terms are specified as time-averaged variables that are taken as exogenous. Bootstrapping standard errors are calculated in order to avoid misleading estimator precision (Cameron et al., 2008).

We need various tests. A test for the presence of selection bias can be carried out by means of Wald tests on the joint significance of the IMRs. The null hypothesis is that the coefficients are jointly zero. Sargan-Hansen's test (Wooldridge, 2010) compares fixed effects versus random effects under the null hypothesis that the individual effects are uncorrelated with the observed explanatory variables.

3.3. Simulated decomposition of the contribution of macroeconomic variables to export activity

One of the objectives of our paper is to explain the relationship between macroeconomic conditions and firm-level export activities, which should be interesting to achieve a better knowledge about the influence of economic policy on the foreign sector. This way it would be very interesting to simulate some potential responses of the export profile of Spanish manufacturing firms to structural adjustments in terms of macroeconomic scenarios for those years related to the economic and financial crisis, that is, 2008-2013.

In 2008 the Spanish housing bubble bursts, leading to a deep recession and to the collapse of domestic demand. That should have forced exporting firms to increase significantly their intensity in order to maintain their profits. However, the decision of a non-exporter firm to export is more complex because it means assuming fixed and sunk costs. So, it would be

worth investigating under what business and financial conditions of the Spanish economy a non-exporter firm can decide to export.

It would be of interest to simulate the contribution of the different macroeconomic variables related to business and financial cycles to the time evolution of extensive and intensive export activity of the firms in the sample. The estimated coefficients of the macroeconomic variables for the export activity (equations (1)-(3)) will allow us to extrapolate what percentage of the variation, both in the decision to export and in export intensity, has been due to each macroeconomic variable, assuming the other independent ones take their value before the crisis, in 2007. These calculations will be made taking as a representative firm, the one that is in the mean of the distribution of our sample for continuous variables, and the median for dummy variables.

3.4. Sample Data and Variables

Database on this paper comes from different combined sources corresponding to the period 1996-2013. (i) Survey on Business Strategies (ESEE)¹, which includes manufacturing firms operating in Spain, for firms' characteristics (structural, strategy, resources and productivity, and financial variables). The ESEE is representative of the Spanish manufacturing firms classified by industry and size. The sampling scheme of the ESEE is the following. Firms with 10 to 200 employees were randomly sampled and the rate of participation is around 4%. Firms with more than 200 employees were requested to participate, obtaining a participation rate around 60%. To minimise attrition, the survey annually incorporates new firms with the same sampling criteria as in the base year. Information on business and financial cycle variables come from different institutions: (ii) Spanish Statistical Office (INE) for GDP indicators²; (iii) Bank

¹ The dataset, the questionnaire and the description are available from: <https://www.fundacionsepi.es/investigacion/esee/en/spresentacion.asp>

² The dataset and the description are available from: https://www.ine.es/dyngs/INEbase/en/operacion.htm?c=Estadistica_C&cid=1254736164439&menu=ultiDatos&idp=1254735576581

of Spain (BDE) for financial cycle variable³; (iv) Ministry of Economy and Competitiveness of Spain (MINECO) for the Spanish competitive indicators⁴; and (v) Netherlands Bureau for Economic Policy Analysis (CPB) for World Trade data⁵. Table 1 shows detailed information about the variables, the reason of use, the sources and the related equations.

Table 1.- Variables Description

<i>Variable</i>	<i>Definition</i>	<i>Rationale</i>	<i>Source</i>	<i>Eq</i>
<i>Dependent variables</i>				
y_{it1}	Dummy variable for exporter firm	Dependent variable for the export decision and expresses the status of every firm and year as exporter	ESEE	[1] [3]
y_{it2}	Value of the exports expressed in Euros at constant prices (GDP prices deflator)	Dependent variable for the export intensity	ESEE INE	[2]
<i>Independent variables</i>				
<i>Structural variables</i>				
Employees	Number of employees	Proxy of size. Increases in size are expected to have a positive effect on export activity, but this effect decreases as employment rises. (Bernard and Jensen, 2004)	ESEE	[1] [3]
Age	Dummy variable for years since the firm was founded. Young if the age is between 0 and 5 years; mature if the age is between 5 and 15; and old if age is higher than 15, which is the omitted category	It is expected that the positive effect of age on the export activity will be marginally decreasing (Roberts and Tybout, 1997; Greenaway et al., 2007).	ESEE	[1] [3]
Sales	Sales expressed in Euros at real terms by employing the individual firm deflator calculated from the yearly variation in the prices of their products.	Proxy of size. If the estimated coefficient of the sales variable is higher (lower) than 1 the proportion of exports in the total sales of the firm increases (decreases) as the size of the firm increases. (Greenaway et al., 2007)	ESEE	[2]
Group Membership	Dummy variable for firms that belong to a business group.	Firms belonging to a business group are expected to be more likely to export, since the group allows firms to overcome the problem of lacking the resources needed to export, such as finance, or physical or human capital (Bernard and Jensen, 2004; Greenaway et al., 2007).	ESEE	[1] [3]
Owned by Foreign Capital	Dummy variable for firms with non-residents holding a proportion of shares of the firm above 50%	Multinational firms have business relationships with firms located in foreign countries. They also have the advantage of using their multinational distribution networks (Greenaway et al., 2007).	ESEE	[1] [3]
<i>Strategy variables</i>				
Investment Projects in R&D	Dummy variable for firms that invest funds in R&D activities	R&D capability leads firms to export through differentiated products and/or cutting-edge technology (Barrios et al., 2003; Aw et al., 2007; Girma et al., 2008)	ESEE	[1] [3]
Standardized Products	Dummy variable for firms that produce and sell standardized products.	Firms that produce and sell standardized products are more likely to compete with a cost advantage (Cavusgil and Zou, 1994)	ESEE	[1] [2]
R&D Intensity	Ratio between R&D expenditures and sales	Firms that raise the intensity of R&D, increase the intensity of exports (Bleaney and Wakelin, 2002; Girma et al., 2008)	ESEE	[2]
Advertising Intensity	Ratio between advertising expenditures and sales	Firms advertisement can help in increasing export sales	ESEE	[2]
<i>Resources and productivity variables</i>				
Real Net Fixed Assets per Employee	Ratio between plant and property assets at constant prices and employees	Export firms tend to be more capital intensive than those non-exporters. (Fabling and Sanderson, 2013).	ESEE	[1] [2]
Real Labour Cost per Employee	Ratio between total labour costs at constant prices and employees	Measure the quality of the labour and/or labour costs (Girma et al., 2004)	ESEE	[1]
Skills	Ratio between employees with a university degree and the total number of employees.	Firms with labour quality produce output with a higher value (Bernard and Jensen 1995, 2004; Bernard et al. 2006).	ESEE	[1]
Real Value Added per Employee	Ratio between value added at constant prices and employees	If TFP contributes to making a firm an exporter or to exporting more, then the labour productivity variable should have an	ESEE	[1]

³ The dataset and the description are available from: https://www.bde.es/webbde/en/estadis/infoest/temas/sb_cfesp.html

⁴ The dataset and the description are available from: <http://www.comercio.gob.es/en/comercio-exterior/estadisticas-informes/Pages/Indice-de-tendencia-de-competitividad-.aspx>

⁵ The dataset and the description are available from: <https://www.cpb.nl/en/worldtrademonitor>

		estimated positive coefficient (Girma et al., 2004; Fabling and Sanderson, 2013).		
Unit labour cost	Ratio between labour cost per employee and the real value added per employee	Lower unit labour costs is a proxy of net profits per employee, which is an indicator of financial performance (Girma et al., 2004)	ESEE	[2]
Financial variables				
Cash Flow/Assets	Ratio between internally generated cash flows and total volume of assets	Firms with higher cash flows will be less restricted to finance the investments resulting from export activities (Bellone et al., 2010; Minetti and Zhu, 2011)	ESEE	[1] [2]
Debt with cost/Liabilities	Ratio between external funds available and total volume of liabilities	Firms with lower financial risk will be in a better position to obtain a fraction of debt to finance investments (Bellone et al., 2010; Minetti and Zhu, 2011)	ESEE	[1] [2]
Debt Average Cost	The weighted average of the cost of long and short debt with cost	Firms with higher debt cost will be more restricted to finance investments (Bellone et al., 2010; Minetti and Zhu, 2011)	ESEE	[1] [2]
Macroeconomic variables				
Real Domestic Demand Growth	Annual percentage change in Spanish real domestic demand at constant prices obtained directly from Annual Spanish National Accounts (it is the interannual variation rates of chain-linked volume index of internal demand)	A shrinking domestic demand increases the probability and/or intensity of exporting. (Esteves and Rua, 2015; Bobeica, et al., 2015).	INE	[1] [2]
World Trade Volume Growth	Annual percentage change on the world trade volume	A higher external demand increases the probability and/or intensity of exporting. (Esteves and Rua, 2015; Bobeica et al., 2015).	CPB	[1] [2]
Spanish Competitiveness Index	Real effective exchange rate for the Spanish economy against OECD countries, as calculated from the unit value indexes of exports and nominal exchange rate indexes for all these countries.	An increase (decrease) in this index means an appreciation (depreciation) of the Spanish currency in real terms and, therefore, deterioration (improvement) of the external competitiveness of the Spanish economy (Campa, 2004; Ca' Zorzi and Schnatz 2007; Christodouloupoulou and Tkačevs, 2014).	MINECO	[1] [2]
GDP Deflator	Annual percentage change in the Spanish GDP Deflator	An increase in the GDP price deflator reduce the probability and/or intensity of exporting (Ca' Zorzi and Schnatz 2007; Christodouloupoulou and Tkačevs, 2014)	INE	[1] [2]
Debt Non-Financial Companies/GDP	Ratio of the total debt of Spanish non-financial companies over Spanish nominal GDP	An increase in the ratio of the debt of non-financial firms over GDP means better access to external financial resources, which increases the probability of starting export and also shortens the time before firms decide to serve foreign customers	BDE	[1] [2]

The final database consists of an unbalanced sample of 22,830 firm-year observations, over a varying number of years. Table 2 shows how the panel is distributed, and also that the proportion of time observations in which firms report export activities is independent of the number of years we observe the firm, around 55% and 87% of the years.

Table 2.- Composition of the panel

Time observations	Total sample		Subsample Export	
	Num firms	Num observations	Num firms	Num observations
1	347	347	302	302
2	306	612	235	470
3	361	1083	284	852
4	292	1168	220	880
5	231	1155	167	835
6	245	1470	162	972
7	350	2450	232	1624
8	95	760	65	520
9	89	801	67	603
10	120	1200	78	780
11	79	869	48	528

12	109	1308	79	948
13	82	1066	58	754
14	75	1050	41	574
15	97	1455	56	840
16	77	1232	51	816
17	74	1258	52	884
18	197	3546	123	2214
Total	3,226	22,830	2,320	15,396

Table 3 presents the basic summary statistics of firm characteristics for total sample and for subsample of firms with export activities. Several facts stand out. The firms that export are the largest and oldest ones. In addition, firms with export activities are participated by foreign capital and belong more often to a group of firms.

Table 3.- Basic summary statistics of firms characteristics

	Total sample		Subsample Export	
	Mean	Std. Dev.	Mean	Std. Dev.
Exports (in thousands)	30925.37	220206.30	45822.59	266774.10
Sales (in thousands)	68252.62	304199.80	96503.31	365592.40
Employees	269.84	809.20	371.38	959.95
Age < 5 (% of firms)	4.34	20.37	3.25	17.74
5 ≤ Age < 15 (% of firms)	24.92	43.26	19.60	39.70
Age ≥ 15 (% of firms)	70.74	45.50	77.15	41.99
Group membership (% of firms)	36.46	48.13	47.95	49.96
Owned by foreign capital (% of firms)	17.25	37.78	24.33	42.91
Standardized Products (% of firms)	59.79	49.03	61.93	48.56
Investment projects in R&D (% of firms)	38.69	48.70	52.22	49.95
Debt with cost/Liabilities	0.25	0.20	0.25	0.20
Cash Flow/Assets	0.10	0.69	0.10	0.82
Debt Average Cost	4.93	2.00	4.79	1.91
Real Value Added/Total Workers	42235.21	44963.66	47524.80	49231.89
Real Labour Costs/Total Workers	20569.06	13490.93	22459.17	14745.64
Real Net Fixed Assets/Total Workers	51418.92	173822.80	61058.36	206379.70
Skills (% Bachelors)	5.66	8.02	6.63	7.92
Investment R&D/Sales	0.01	0.22	0.01	0.03
Publicity/Sales	1.27	2.99	1.53	3.22
Observations	22,830		15,396	

4. Empirical results and discussion

4.1. Results of Probit Model for the Decision to Export

Table 4 presents the results of the estimations of probit model Equation (1). In the left hand side of the table, the estimated model includes firm level and time varying macroeconomic variables as explanatory for the decision to export. In the right hand side estimations the macroeconomic variables are replaced by time dummy variables; the estimated coefficients of the dummy variables will indicate the net effect of internal and external demand pressures in firms' export decisions. For each specification of the probit model, Table 4 presents the results of the estimation assuming that the firm specific effects are random, first, and assuming that they are fixed, next. The statistic parameter of the Hausman test rejects the null hypothesis of random firm specific effects in the two specifications so we will focus on the results when the firms' effects are fixed.

Table 4.- Results of the Estimation of the Probability of Exporting

	<i>Model with Macro Variables</i>						<i>Model with temporal dummies</i>					
	<i>Fixed Effects Panel Data</i>			<i>Random Effects Panel Data</i>			<i>Fixed Effects Panel Data</i>			<i>Random Effects Panel Data</i>		
	<i>Coef.</i>	<i>Std. error</i>		<i>Coef.</i>	<i>Std. error</i>		<i>Coef.</i>	<i>Std. error</i>		<i>Coef.</i>	<i>Std. error</i>	
Employees	0.003	(0.000)	***	0.004	(0.000)	***	0.003	(0.000)	***	0.004	(0.000)	***
Employees^2	-5.0E-07	(0.000)	***	-2.7E-07	(0.000)	***	-5.0E-07	(0.000)	***	-2.7E-07	(0.000)	***
Age < 5	-0.722	(0.158)	***	-0.986	(0.127)	***	-0.663	(0.162)	***	-0.968	(0.129)	***
5 ≤ Age < 15	-0.431	(0.085)	***	-0.642	(0.071)	***	-0.393	(0.087)	***	-0.629	(0.072)	***
Group membership	0.316	(0.118)	***	0.763	(0.092)	***	0.307	(0.118)	***	0.766	(0.092)	***
Owned by foreign capital	0.588	(0.187)	***	1.329	(0.135)	***	0.584	(0.187)	***	1.330	(0.135)	***
Standardized Products	-0.014	(0.087)		0.089	(0.072)		-0.017	(0.088)		0.090	(0.072)	
Investment Projects in R&D	0.289	(0.086)	***	0.782	(0.072)	***	0.295	(0.086)	***	0.786	(0.072)	***
Debt with cost/Liabilities(-1)	0.215	(0.165)		0.203	(0.139)		0.227	(0.166)		0.208	(0.139)	
Cash Flow /Assets (-1)	0.011	(0.025)		0.009	(0.022)		0.013	(0.027)		0.010	(0.023)	
Debt Average Cost (-1)	-0.005	(0.016)		-0.021	(0.014)		0.004	(0.018)		-0.024	(0.016)	
Real Value Added / Employees	-1.3E-06	(0.000)		1.8E-07	(0.000)		-1.2E-06	(0.000)		1.9E-07	(0.000)	
Real Labour Costs / Employees	1.9E-06	(0.000)		6.6E-06	(0.000)	**	1.7E-06	(0.000)		6.6E-06	(0.000)	**
Real Net Fixed Assets/ Employees	2.2E-07	(0.000)		8.8E-07	(0.000)	*	1.4E-08	(0.000)		7.6E-07	(0.000)	*
Skills	0.008	(0.006)		0.017	(0.005)	***	0.007	(0.006)		0.017	(0.005)	***
1996							-0.282	(0.174)		0.139	(0.148)	
1997							-0.025	(0.156)		0.286	(0.134)	**
1998							0.038	(0.139)		0.214	(0.121)	*
1999							0.013	(0.128)		0.128	(0.112)	
2000							0.129	(0.126)		0.228	(0.112)	**
2001							0.052	(0.126)		0.153	(0.112)	
2002							0.080	(0.124)		0.135	(0.110)	
2003							-0.068	(0.125)		0.012	(0.111)	
2004							-0.103	(0.124)		-0.070	(0.110)	
2005							0.090	(0.125)		0.088	(0.112)	

2006						-0.007	(0.127)	-0.042	(0.114)
2008						0.049	(0.117)	0.029	(0.101)
2009						0.008	(0.124)	0.092	(0.106)
2010						0.067	(0.126)	0.090	(0.108)
2011						0.151	(0.126)	0.170	(0.108)
2012						0.346	(0.132)	***	0.328 (0.113) ***
2013						0.249	(0.134)	*	0.252 (0.116) **
$\chi^2(17)$						25.22	*	26.78	*
GDP Deflator	-5.436	(3.034)	*	-3.526	(2.686)				
Real Domestic Demand Growth	1.267	(1.689)		-1.115	(1.483)				
World Trade Volume Growth	-0.132	(0.517)		0.208	(0.451)				
Debt Non Financial Companies/GDP	0.297	(0.164)	*	-0.078	(0.141)				
Spanish Competitiveness Index	-0.035	(0.012)	***	-0.024	(0.010)				**
Sectorial dummies $\chi^2(19)$				155.11	***			155.75	***
Constant	6.996	(126.290)		4.108	(1.029)	***	3.625 (142.798)	1.395	(0.366) ***
Hausman Test	258.548	***					265.004 ***		
Observations	22,830			22,830			22,830	22,830	
Log pseudolikelihood	-2543.1			-5555.3			-2536.9	-5550.9	

Note: (***) significant coefficient at 1%; (**) significant coefficient at 5%; (*) significant coefficient at 10%.

The sign and absolute values of estimated coefficients of the firm level variables are very similar in the specification with macroeconomic variables and in the specification with time effects. Only the structural variables of size, age and ownership, and the strategy variable of doing formal R&D have estimated coefficients statistically significant different from zero. The likelihood of exporting is higher as the size of the firm increases, but the marginal effect of size on the likelihood of exporting decreases for higher values of size at which the marginal effect is evaluated. Older firms, firms belonging to business groups and firms with foreign ownership are more likely to export than young, independent and Spanish-owned firms. Finally, the likelihood of being an exporter is higher among firms that do formal R&D than among firms that do not. Neither the variables that capture the financial conditions of firms, nor the variables on resources and productivity have estimated coefficients significantly different from zero. The capital intensity and quality of labour input variables (skills and labour costs per employee), have estimated positive and significant coefficients in the random effects specification but not in the fixed effects one, which suggests that differences in these resource input variables across firms are correlated with idiosyncratic and unobservable characteristics of them.

The results of fixed effects estimations in Table 4, the likelihood of being an exporter increases with size, age and group and foreign ownership of firms, coincide with the results of Greenaway et al. (2007). As we find here with Spanish firms, Greenaway et al. (2007) also find that the variables on financial conditions of firms have no significant effect on the probability of being an exporter, controlling for firm specific effects. Other papers, for example Bellone et al. (2010) find that firms with better financial conditions are more likely to be exporters but they do not control for firms' specific effects. The evidence of a higher likelihood of being an exporter among firms that do R&D has been found also in previous research (Girma, Görg and Hanley, 2008), although without controlling for firms' fixed effects.

The results of Table 4 indicate that the likelihood of being an exporter significantly depends on the competitiveness index of the Spanish economy, on the GDP deflator and on the ratio of indebtedness of non-financial corporations. The estimated negative signs of the coefficients of the Spanish Competitiveness Index and GDP deflator variables indicate that lower costs of producing in Spain, and higher comparative price competitiveness of Spanish exports, both increase the likelihood that a firm of given characteristics will export. Higher leverage ratio of Spanish non-financial corporations, a proxy of lax monetary and financial conditions, has a positive effect on the likelihood of exporting.

The estimated coefficients of the Real Domestic Demand Growth and World Trade Volume Growth variables are not statistically different from zero. Therefore the evidence indicates that controlling for the characteristics of firms, the decision to export or not is unaffected by the time evolution of the domestic aggregate demand. Bernard and Jensen (2004), for US firms, and Campa (2004), for Spanish manufacturing firms, also find a positive effect of devaluation of the national currency relative to the currency of the country of destination of exports on the likelihood of becoming an exporter. The result of a positive effect of the ratio of indebtedness of the economy on the likelihood of exporting is new in the literature.

When time dummy variables are used as explanatory variables of the likelihood that a firm exports in a particular year of the time period, the only statistically significant coefficients are those of the time dummies 2012 and 2013; the omitted time dummy variable is the year 2007. The positive signs of the significant coefficients indicate that, controlling for firms' characteristics, the macroeconomic conditions for being an exporter improve in 2012 and in 2013, compared to those in 2007 and the rest of the years.

Table 5 presents additional estimated values of the parameters of the model for different specifications consisting in removing the GDP deflator, column one, and the competitiveness index, column two, of the explanatory variables of the likelihood of exporting. In the two estimations the coefficients of the firm level variables are practically the same as those obtained in the base model (Table 4). When the GDP deflator variable is excluded from the explanatory variables, the competitiveness variable maintains a negative and significant estimated coefficient, but the estimated coefficient of the GDP variable is significant only when the competitiveness variable is one of the explanatory variables of the model.

The time evolution of the cost of producing in Spain alone, captured by the GDP deflator, is uninformative of the likelihood of exporting but, combined with the information on price competitiveness of the exports, it is (although the coefficient is significant only at 10%). When exporters lower export prices, and external demand of goods produced in Spain increases, if costs of producing in Spain also go down the profit margins of exported goods are unaffected by the lower export prices; the more favourable profit margin is, the more will increase an additional stimulus for firms deciding to export.

Table 5.- Probability of Exporting: Robustness

<i>Model with Macro Variables</i>						
	<i>Fixed Effects Panel Data</i>			<i>Fixed Effects Panel Data</i>		
	<i>Coef.</i>	<i>Std. error</i>		<i>Coef.</i>	<i>Std. error</i>	
Employees	0.003	(0.000)	***	0.003	(0.000)	***
Employees^2	-5.0E-07	(0.000)	***	-4.9E-07	(0.000)	***
Age < 5	-0.722	(0.158)	***	-0.717	(0.158)	***
5 ≤ Age < 15	-0.440	(0.085)	***	-0.425	(0.085)	***
Group membership	0.322	(0.118)	***	0.319	(0.118)	***
Owned by foreign capital	0.573	(0.187)	***	0.596	(0.187)	***
Standardized Products	-0.015	(0.087)		-0.008	(0.087)	
Investment Projects in R&D	0.297	(0.086)	***	0.292	(0.086)	***
Debt with cost/Liabilities(-1)	0.226	(0.165)		0.209	(0.165)	
Cash Flow /Assets (-1)	0.010	(0.025)		0.011	(0.025)	
Debt Average Cost (-1)	-0.009	(0.016)		-0.019	(0.015)	
Real Value Added / Employees	-1.4E-06	(0.000)		-1.3E-06	(0.000)	
Real Labour Costs / Total Workers	2.2E-06	(0.000)		2.3E-06	(0.000)	
Real Net Fixed Assets / Employees	2.3E-07	(0.000)		2.4E-07	(0.000)	
Skills	0.008	(0.006)		0.008	(0.006)	

GDP Deflator				-4.682	(3.020)	
Real Domestic Demand Growth	-1.056	(1.082)		0.541	(1.668)	
World Trade Volume Growth	0.268	(0.466)		-0.088	(0.516)	
Debt Non Financial Corporation/GDP	0.226	(0.159)		-0.009	(0.127)	
Spanish Competitiveness Index	-0.033	(0.012)	***			

Constant	6.832	(132.060)		3.824	(132.220)	
Hausman Test	256.830		***	255.18		***
Obs.	22,830			22,830		
Log pseudolikelihood	-2544.68			-2547.44		

Note: (***) significant coefficient at 1%; (**) significant coefficient at 5%; (*) significant coefficient at 10%.

4.2. Results and discussions of Heckman model for export intensity

We now present in Table 6, the results of estimating the model on the determinants of the proportion of exports in the total sales of the firm, intensity of exports, equations (2) and (3), where the standard errors are obtained using panel bootstrap (see Cameron and Miller, 2015). The hypothesis of random firm unobserved effects is rejected by the Sargan-Hansen test so we present only estimates with firm fixed effects. Column one shows the results of the estimation with time varying macro-economic variables and column two the results of estimating with time dummy variables. The statistically significant estimated coefficient of the Mills' ratio

variable confirms the relevance of controlling for possible sample selection bias in the estimation of the coefficients of the model.

Table 6.- Results of the Estimation of Exports' Intensity

	<i>Fixed Effects Model with macro variables</i>			<i>Fixed Effects Model with temporal dummies</i>		
	<i>Log (Exports)</i>			<i>Log (Exports)</i>		
	<i>Coef.</i>	<i>Std. Error</i>		<i>Coef.</i>	<i>Std. Error</i>	
Log(sales)	0.945	(0.053)	***	0.924	(0.055)	***
Standardized Products	-0.132	(0.049)	***	-0.127	(0.049)	***
Debt with cost/Liabilities(-1)	0.219	(0.068)	***	0.215	(0.067)	***
Cash Flow /Assets (-1)	-0.019	(0.063)		-0.018	(0.049)	
Debt Average Cost (-1)	-0.019	(0.007)	***	-0.007	(0.008)	
Expenditures R&D / Sales	-0.001	(0.654)		-0.039	(0.658)	
Advertising expenditures / Sales	-0.004	(0.006)		-0.003	(0.006)	
Unit Labour Costs	-7.5E-05	(0.001)		-5.7E-05	(0.001)	
Real Net Fixed Assets / Employees	-5.9E-08	(0.000)		-8.0E-08	(0.000)	
1996				-0.067	(0.071)	
1997				-0.017	(0.059)	
1998				0.000	(0.053)	
1999				0.005	(0.042)	
2000				0.044	(0.042)	
2001				0.043	(0.035)	
2002				0.036	(0.044)	
2003				0.040	(0.046)	
2004				0.035	(0.044)	
2005				0.024	(0.038)	
2006				0.010	(0.032)	
2008				0.048	(0.030)	
2009				0.133	(0.041)	***
2010				0.206	(0.039)	***
2011				0.264	(0.041)	***
2012				0.349	(0.037)	***
2013				0.428	(0.040)	***
$\chi^2(17)$				155.84	***	
GDP Deflator	-3.499	(1.170)	***			
Real Domestic Demand Growth	-1.530	(0.626)	**			
World Trade Volume Growth	0.404	(0.157)	***			
Debt Non Financial Companies/GDP	0.088	(0.071)				
Spanish Competitiveness Index	-0.015	(0.004)	***			
Inverse Mills Ratio (IMR) included						
$\chi^2(18)$	29.60	**		31.13	**	
Sargan-Hansen Test.	123.28	***		146.30	***	
Observation.	15,396			15,396		

Note: (***) significant coefficient at 1%; (**) significant coefficient at 5%; (*) significant coefficient at 10%.

The hypothesis that the estimated coefficient of the *Log(Sales)* variable is equal to one is not rejected in the two estimations, ($\chi^2(1) = 1.08$, in the model with macroeconomic variables and $\chi^2(1) = 1.93$ in the model with temporal dummies). The elasticity parameter is equal to one, which means that export intensity will move proportionately with the total sales of the firms.

The leverage ratio, debt over total assets, has a positive effect, while cost of debt has a negative one, both statistically significant on the volume of exports. The positive effect of leverage and external finance on the volume of exports indicate that, as the proportion of exports on total sales increases, firms rely proportionally more on external debt finance to finance the investments needed to sustain exports. Finally, firms with higher cost of debt, presumably riskier firms, reduce the volume of exports, compared with firms with lower cost of debt, because higher financial cost reduces the incentives to invest in export activities.

These results are similar to others in the literature. Fabling and Sanderson (2013) find a positive effect of leverage, external finance, on export intensity, and explain this result with the arguments that export activities are intensive in capital, therefore firms need to finance their high capital investment. Bellone et al. (2010) find that a negative association between exports intensity and financial health of the companies is explained with the argument that sunk costs of exporting lowers the financial performance of firms.

The effect of standardized products on the export intensity is negative and significant. That means that a company with “client tailored” product specification policies exports more intensively than firms that sell standardized products. Other papers have found a positive association between export intensity and proxy variables of product differentiation by firms (Aw, Roberts, and Winston, 2007; Barrios, Görg, and Strobl., 2003; Bleaney and Wakelin, 2002; Christensen, Rocha and Gertner, 1987; Girma et al., 2008; Grossman and Helpman, 1995). The empirical evidence suggests that value effects from differentiation dominate over the scale economies effects of standardization (Cavusgil and Zou, 1994).

The estimated coefficients of the variables intensity of R&D, volume of advertising, unit labour costs and capital intensity are not statistically significant. For those firms that export, the proxy variables that have differences in intensity in tangible and intangible assets, and in unit labour costs, do not seem to influence the volume of exports, controlling for firm specific effects.

The estimated coefficients of the macroeconomic variables are all statistically significant, except *Debt Non Financial Companies/GDP*. The coefficients of the GDP deflator and of the competitiveness index are both negative, and that of the ratio of corporate debt is positive, i.e. the three maintain the same signs as in Table 4. The estimated coefficient of the growth in domestic demand variable is negative and the coefficient of the variable growth in world trade is positive. Lower production costs in Spain and lower relative prices in export markets (competitiveness) have a positive effect on the volume of exports, relative to total sales of the firms, beyond the effects on the volume of exports resulting from the characteristics of firms. The intensity of exports is inversely related to the pressure from internal demand, increasing when internal demand goes down and decreasing when internal demand goes up. The general effect from external demand growth, World Trade Volume Growth, is also positive and statistically significant.

The sensitivity of exports intensity to the pressures from internal demand found in this paper with firm level data is in line with the similar results found recently with country level data (Bobeica et al., 2016; Esteves and Rua, 2015). Christodouloupoulou and Tkačevs (2016) find a negative association between GDP deflator and export intensity with data from the Euro area member states. Campa (2004) also finds a negative association between price competitiveness, exchange rate, and export intensity with data from manufacturing Spanish firms in the period when Spain was still out of the Euro zone.

The second column in Table 6 shows the results of the estimation of the model on determinants of intensity of exports using time dummies instead of macroeconomic variables as explanatory of time varying effect common to all firms. The estimated coefficient of the average cost of debt variable is no longer statistically significant and the coefficient of the capital intensity variable is negative and significant with p value $< 10\%$. The effect of the cost of debt variable on the volume of exports is better captured by a time changing variable common to all firms than by firms' differences with regard to the values of the cost variable. The Euro and the changing monetary conditions for Spanish firms after Spain joined the Euro zone, probably explains this result that is not captured by the macroeconomic variables chosen as explanatory of exports in column one.

The estimated coefficients of the time dummy variables are positive and significant for the years 2009 till 2013; the omitted time dummy is 2007. Moreover, the estimated coefficients are increasing over time, indicating that the intensity of exports across firms have been steadily increasing over time since 2009, i.e. during all the years of the crisis. Controlling for the characteristics of firms, the export intensity in 2013 is 42.85% higher than in 2007.

4.3. Assessment of the contribution of macroeconomic variables to export activity

In this section, we quantify the contribution of the evolution of macroeconomic variables, internal and external demands growth, external Spanish competitiveness and corporate sector leverage, over the time evolution of the extensive and intensive export activity of the firms in the sample. For this purpose, we fix the values of the firm level variables at their sample mean values, and estimate the effect on the probability of exporting and on the volume of exports, substituting in the estimated model the values of one of the macroeconomic variables at a time every year between 2008 and 2013.

The results of the simulations are presented in Figure 1, extensive exporting, and Figure 2, intensive exporting; the values shown are cumulative in the sense that the predicted change in a period is added to the beginning of the period level of the corresponding predicted variable.

Figure 1.- Simulating Cumulative Macroeconomic Effects on the Change of Probability of Exporting

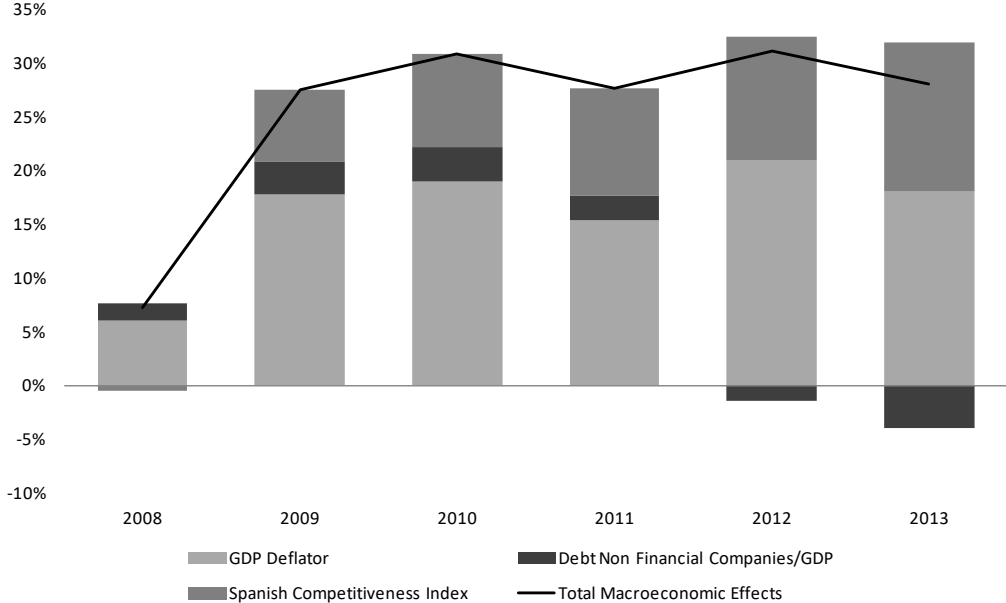
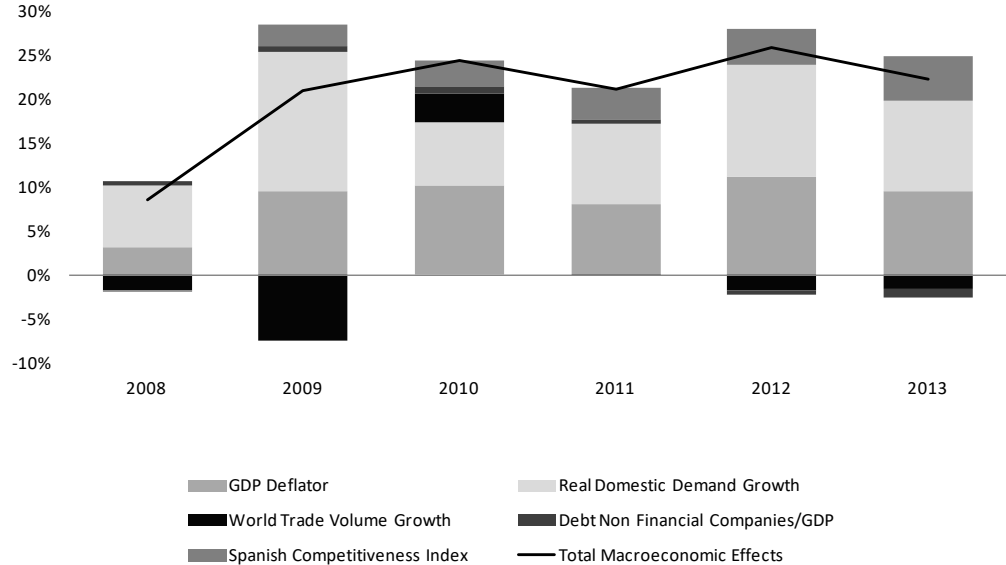


Figure 2.- Simulating Cumulative Macroeconomic Effects on the Change of Export Intensity



The contributions of cost, *GDP deflator*, and price competitiveness, *Spanish Competitiveness Index*, to the likelihood of exporting have always been positive in the period,

Figure 1. The financial cycle first contributed positively until 2011 and later on negatively, 2012 and 2013. In 2008, the only relevant contribution to the probability of exporting is from the fall in the GDP deflator; in 2009, the additional fall in the GDP deflator increases, substantially, the contribution of production costs to the value of the dependent variable and the positive shock has continued more or less at the same cumulative level for the rest of the period (except for a decline in 2011 with respect to 2010). The positive contribution of external price competitiveness to the probability of exporting is positive since 2009 and has been cumulatively increasing every year since. As said before, the deleveraging of the corporate sector in 2012 and 2013 has contributed negatively to the likelihood of exporting. In 2013, the cumulative increment in the probability of exporting attributed to the evolution of macroeconomic variables since 2007 is around 30%; half of the contribution from lower production costs, and the other half from lower export prices.

As for the intensity of exports among exporters, Figure 2, the larger contribution comes from the time evolution of the real growth in domestic demand, followed by the time evolution of the GDP deflator and by the competitiveness index. Once again, the highest positive shock from internal demand and from the time evolution of the GDP deflator on the intensity of exports occurs in 2009; in this year the growth of external demand contributes negatively and substantially to the intensity of exports of Spanish manufacturing firms. By the end of the period, 2013, the cumulative positive effect on exports' intensity since 2007, attributed to the evolution of the macroeconomic variables, is 20%. Now the largest contribution is from the decrease in internal demand, 45%, followed by cost, 35%, and price competitiveness, 20%.

5. Conclusions

This paper examines the determinants of a firm exporting and, among the exporting firms, the determinants of the intensity of exporting activity, for a representative sample of manufacturing

Spanish firms in the period 1996–2013. The research question is, controlling for firms' characteristics that affect their incentives to become exporters and the volume of exports, to what extent export related decisions of firms are influenced by macroeconomic conditions? More particularly the paper investigates whether there is a tradeoff between economic policies that increase external price, and cost competitiveness (for example internal wage deflation) and the depressing effect of these policies for domestic demand growth on exports-led economic recoveries.

For this purpose, we model and empirically estimate with data from Spanish manufacturing firms in the period 1996-2013, the decision of a firm to export in year t and the intensity of exports of exporting firms also in year t . In both models the explanatory variables include characteristics of firms (size, financial performance, business strategy) and macroeconomic conditions (growth of domestic demand, growth in world exports, national price and cost competitiveness). The statistical tests justify including time invariant firm specific effects as explanatory of the likelihood of exporting and of the intensity of exports. These tests also justify controlling for sample selection bias (Heckman type model) in the estimation of the determinants of export intensity.

The empirical results indicate that the macroeconomic conditions affect the export activity of firms, even when controlling for firm characteristics including firm fixed effects. They also indicate that the macroeconomic variables affect differently the decision to be an exporter and the volume of exports by the exporters, consistent with the predicted influence of sunk costs in the decision to be an eventual exporter. In particular, we find that external price and cost competitiveness of the Spanish economy positively affects both the decision to export and the volume of exports. On the other hand, the growth of domestic and external demand only affects, inversely, the volume of exports but not the decision to export; the decision to export appears to be independent of demand conditions. We also find that the credit cycle affects positively the export decision but not the volume of exports.

Policy initiatives that increase external competitiveness but depress internal demand will affect the volume of exports of the country through two channels, the direct one of increasing external demand of domestically produced products, if higher external competitiveness allows firms to lower export prices; and the indirect one through the occupation of idle capacity resulting from depressed domestic demand. In terms of contribution to job creation of export-led recoveries by increasing external competitiveness, the exports and employment tied to them should not be counted since they just compensate for the jobs lost as a consequence of lower domestic demand. For the Spanish case studied here, internal demand growth does not contribute significantly to the probability of exporting but it does so in the intensity of exports in a negative way. Consequently, the decrease in domestic demand in 2013 compared with 2007 implies an increase in exports of 10%. Public authorities should also be concerned about the positive effect of firm level and country level leverage on the export activity of firms: more favorable credit conditions stimulate exports but when leverage becomes excessive the need for deleveraging will have negative effects on exports (and jobs).

Although the main interest of the paper is isolating the effect of macroeconomic variables on the export activity of firms, there are other results on the influence of firm level variables in exports worth recalling here. The likelihood of a firm being an exporter increases with size (but at a decreasing rate), with age, with affiliation to a group and with foreign ownership. The likelihood of exporting is also higher among firms that do R&D than among those that do not. However, controlling for idiosyncratic effects, being an exporter appears unaffected by financial, labor costs and productivity situation of firms. The empirical results also show that the intensity of exports among exporters slightly decreases as the size of the firm increases, and that exports intensity increases with the ratio of debt over total assets and decreases with internal generated funds and with the cost of debt. The estimated coefficients of intensity on R&D, advertising expenditures and of the unit labor costs of firms are not statistically significant.

Many other papers have documented what we find here on firm level variables that determine whether a firm is likely to be an exporter, different from the variables that explain the intensity of exports among exporters, but very few control by firm specific effects as we do. The results have policy implications. For example, the evidence that the size of the firm increases the likelihood of becoming an exporter but at a decreasing rate, recommends public policies to reduce the sunk costs of becoming an exporter among firms up to a given size. But the evidence that intensity of exports slightly decreases with size goes against the recommendation of public policies that discriminate across different firm sizes as a way to promote exports. The relevance of idiosyncratic characteristics of firms in explaining differences in extensive and intensive export activities among firms suggests that there are hidden factors, for example the quality of the management team, common to many decisions and attributes of firms, that cannot be detached from the required productive efficiency needed to become a successful exporter.

A further extension of the study would be to analyze export intensity by geographical areas of destination and its relationship to different competitiveness indexes with regard to those areas. This analysis could complement the impact of competitiveness indexes on export intensity.

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