

Exporters of services in Spain

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Key words: exports, services, firm-level evidence, Spain, productivity, heterogeneity

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Abstract

Using unique firm-level data, we analyze the characteristics of services exporters in one of world's most important services traders: Spain. Our paper shows that only a small percentage of firms participate in services export; moreover, exports represent a small share of total turnover for traders. We also find that exporters have a premium over non-exporters in size, sales, labor productivity and differentiation level. These variables also play an important role in determining firms' participation in the export market and in firms' export intensity. Our results show that exporters were already more productive than other firms before starting to export. We do not find evidence that exporting increases firms' productivity.

Resumen

Utilizando micro datos de empresa, este trabajo analiza las características de las empresas exportadoras de servicios en España, uno de los mayores exportadores de servicios en el mundo. El trabajo muestra que solamente un pequeño porcentaje de empresas del sector servicios exporta; además, entre las que exportan, el porcentaje de las ventas que se destina al mercado internacional es pequeño. Nuestro estudio pone de manifiesto que las empresas exportadoras superan a las empresas no exportadoras en empleo, ventas, productividad laboral y grado de diferenciación. Estas variables, asimismo, juegan un papel muy importante a la hora de explicar la participación de las empresas en los mercados internacionales, y la intensidad exportadora. Los análisis empíricos concluyen que las empresas exportadoras ya eran más productivas que las empresas no exportadoras antes de comenzar a exportar. Sin embargo, no hallamos que la productividad crezca más rápido en las empresas exportadoras que en las empresas no exportadoras.

Laburpena

Enpresako mikrodatuak erabilita, lan honetan Espainiako zerbitzu enpresa esportatzaileen ezaugarriak aztertu ditugu, Espainia baita mundua zerbitzuen esportatzaile handienetako bat. Lanak agerian jartzen du zerbitzuen sektoreko ehuneko oso txikiak esportatzen duela; gainera, esportatzen duten zerbitzu enpresetan, nazioarteko merkatuetara bideratzen diren salmenten ehunekoa txikia da. Gure azterlanak erakusten du enpresa esportatzaileak esportatzen ez dutenen gainetik daudela enpleguan, salmentetan, lan ekoizkortasunean eta desberdintze mailan. Aldagai horiek, gainera, oso garrantzitsuak dira enpresek nazioarteko merkatuetan duten parte hartzea eta esportazioen intentsitatea azaltzeko. Análisi enpirikoetatik ondoriozta daiteke enpresa esportatzaileak esportatzen ez dutenak baino ekoizkorragoak zirela esportatzen hasi aurretik. Baina ez dugu aurkitu ekoizkortasuna azkarrago hazten denik enpresa esportatzaileetan esportatzen ez dutenetan baino.

1. Introduction

Services constitute the most important economic activity in the world. According to the World Bank, services accounted for 74 per cent of GDP in high-income countries and 53 per cent of GDP in low and middle-income countries in 2008. With respect to trade, in the year 2009 services already represented 24% of total world exports. Moreover, since the year 2000 exports of services have grown faster than merchandise exports. Growth has been particularly intense in the so-called modern services, such software design, consulting, and engineering, characterized by an intensive use of technology and highly skilled personnel.

Due to the central role that services play in GDP, future growth in the world economy will be tightly link to raising productivity in the services industry.¹ Recent analyses carried out for manufactures have shown that trade might play a very important role in enhancing productivity (Bernard et al., 2007). On the one hand, reductions in the costs of trading lead to a transfer of resources from less productive firms to more productive firms, enhancing the economy-wide productivity level (Pavnick, 2002). On the other hand, the export activity may allow firms to use scale more efficiently, and to learn from customers and competitors in foreign countries (De Loecker, 2007). To determine whether the results obtained for manufactures are applicable to services, we need to analyze the characteristics of services exporters and non-exporters at the micro level. However, due to the difficulty of obtaining microdata on firms engaged in services, there has been scant research in this area.² Moreover, some of the few available databases present limitations with respect to sample size, coverage of services industries, and firm-size.

The contribution of this paper is to enhance the very limited evidence on firm-level trade in services. For that purpose, we analyze the characteristics of the exporters of services in a major European Union country: Spain, which was the seventh exporter of services in the world in 2009 (WTO database). Using firm-level data from the Annual Survey of Services, carried out by the Spanish Statistical Institute (INE), we analyze the share of firms that participate in exports, firms' export-intensity, the concentration of exports across firms, and the differences between exporters and non-exporters in key firm-level characteristics, such as size, turnover, productivity, wages or differentiation level. We also analyze what firm characteristics explain the participation in foreign markets, and the intensity of exports. Finally, we study whether exporting can raise productivity in firms operating in services.³

¹ Moreover, services might also facilitate higher productivity levels in other industries (Francois and Hoekman, 2010). In this respect, Arnold et al. (2011) show that liberalization of services plays a very important role in enhancing productivity in manufactures.

² Previous studies are Gourlay et al. (2005) and Breinlich and Criscuolo (2010) for the UK, Jensen (2008) and Love and Mansury (2009) for the US, Conti et al. (2010) for Italy and Eickelpasch and Vogel (2011) for Germany.

³ Based on other databases, González and Rodríguez (2010) also analyze the characteristics of exporters of services in Spain. However, their sample is much smaller than the one used in this study, and it is biased towards large firms.

Our analyses point out that exporters constitute a small share of firms engaged in services. Moreover, the few firms that export only dedicate a small share of their turnover to international markets. We find that exporters have a premium over non-exporters in size, productivity, wages and differentiation. These characteristics also play a very important role in determining firms' participation in the export market and firms' trade-intensity. We also find that exporters were more productive than non-exporters before starting to export; however, exporting does not seem to help firms on becoming more productive. In sum, results for exporters of services are very similar to those obtained by previous studies for exporters of manufactures, pointing out that models based in firms' heterogeneity provide valid approximations to reality in the services industry.

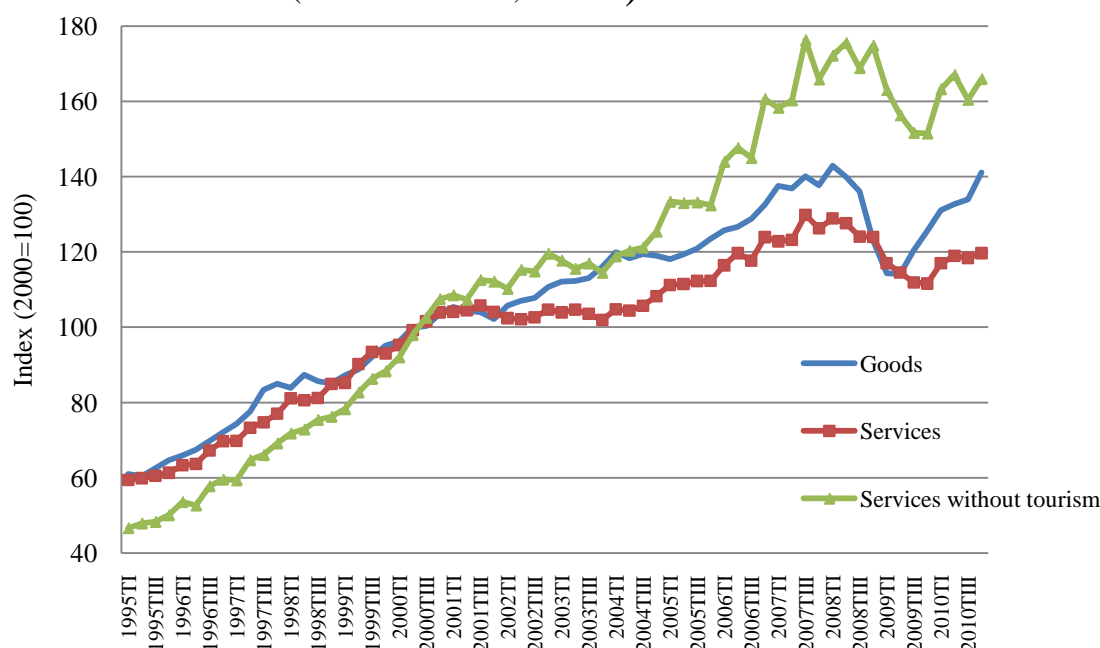
The paper is organized as follows. The next section gives a brief description of the evolution of services exports in Spain. Section 3 presents the database used in our analysis. Section 4 presents different descriptive analyses on service exporters. Section 5 studies the characteristics that determine the participation of services firms in foreign markets and the intensity of exports over total turnover. Section 6 analyses whether exporting enhances firms' productivity level. Section 7 concludes.

2. The evolution of services exports in Spain

Trade in services has received less attention than trade in merchandises in the literature. In fact, until recently, most services were considered as non-tradable, as they demanded face-to-face presence of the customer and the supplier. In contrast to manufacturing, where goods move, in a large number of services' export transactions the supplier or the customer has to move. However, the reduction in communication costs, and in particular the spread of the Internet, has enabled to increase the range of services that can move along long distances. This process, along with trade liberalization and reductions in the cost of travelling, has led to a large increase in services trade. Spain has not been alien to this process.

Figure 1 presents the evolution of the volume of goods exports, services exports and non-tourism services exports in Spain in the period 1995-2010. As shown in the figure, the rate of growth of goods exports has been faster than the rate of growth of services exports: 5.3% annually vs 4.6% annually. However, the lower rate of services exports growth is highly influenced by tourism, which represents almost 35% of services exports in Spain. If we remove tourism from services exports, we can see that other services, such as construction, transport, financial services and business services have experienced an increase in exports, 8.3% annually, that has outpaced the growth in goods exports.

Fig. 1 Evolution of Spanish exports of goods and services , 1995-2010
(Index 2000=100; volume)

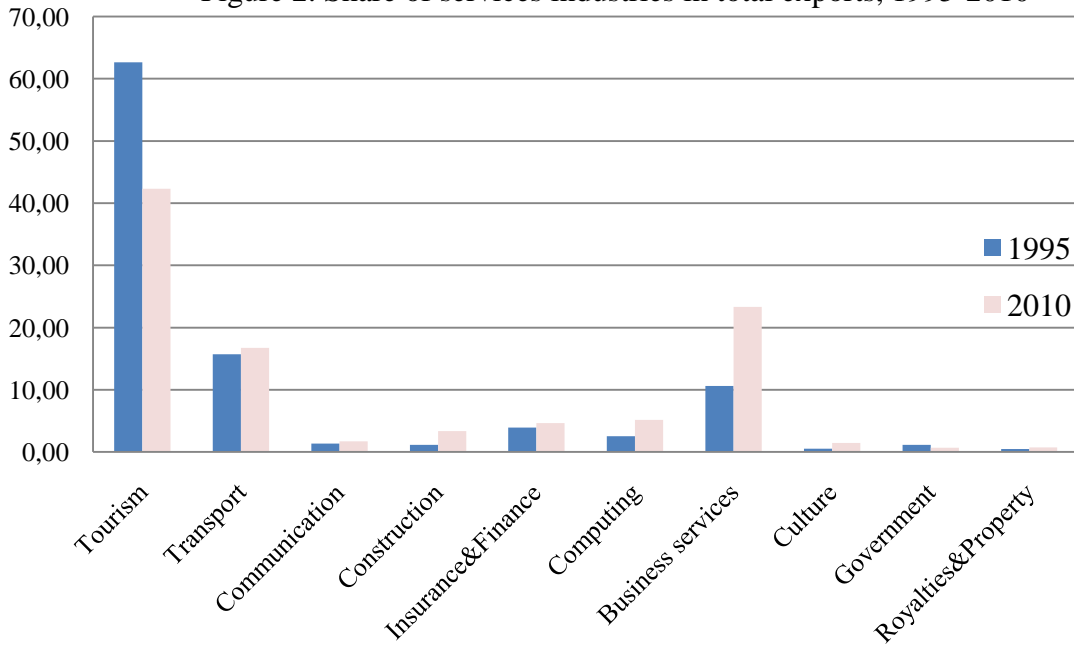


Source: Instituto Nacional de Estadística database.

Due to the higher growth of prices in services than in merchandises, the share of services in Spanish total nominal exports has grown from 30.2% in 1995 to 32.6% in 2010. Figure 2 presents the distribution of services exports across industries in 1995 and 2010. As explained above, tourism accounts for the largest share of services exports in 2010: 42%; nevertheless, its share has been reduced by 20 percentage points during the period 1995-2010. Business services represent the second export industry, with a 23% share; moreover, this share has more than double from 1995 to 2010. Transport has the third highest share, 16%; this percentage has maintained constant during the period of analysis. Among other industries, we should highlight computing (5%), insurance & finance (4%) and construction (3%), which experience a rise in their share during the period 1995-2010.

Finally, Figure 3 presents the evolution of Spain's share in world's exports of services. As shown in the figure, during the period 1995-2009 the Spanish share has kept constant around 3.5%. The highest share in world exports happens in travel, where Spain accounts for 6% of world exports. However, the Spanish travel market share has declined steadily since 2003. In contrast, we observe an increase in the Spanish market share in other services, which rises from 1.8% in 1995 to 2.8% in 2009.

Figure 2. Share of services industries in total exports, 1995-2010



Source: Banco de España database.

3. Microdata

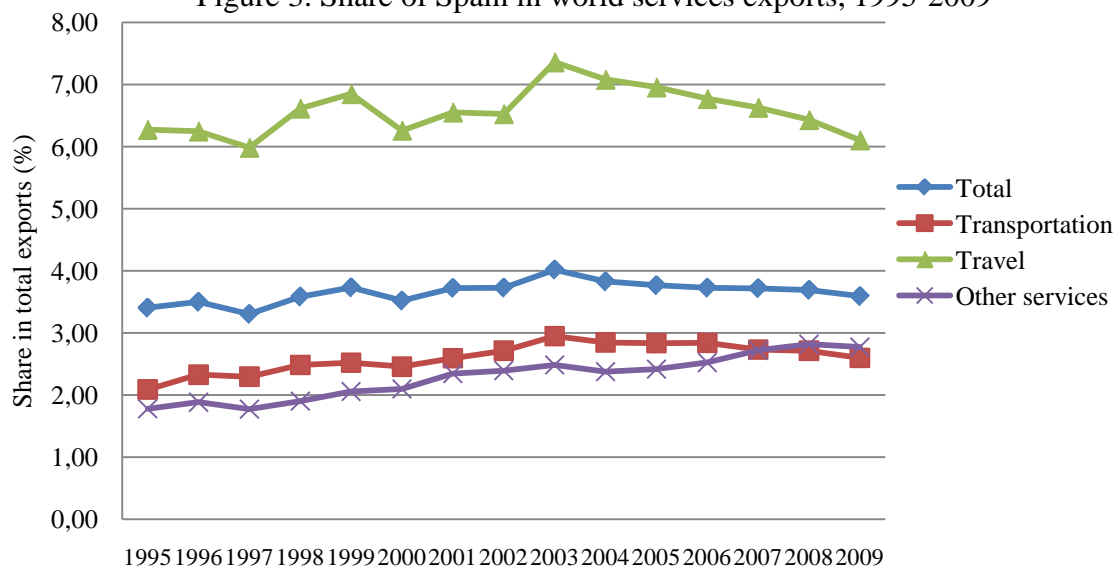
Data on firms operating in services come from the Annual Survey of Services (ASS), which is carried out by the Spanish Statistical Institute (INE). The survey obtains economic and structural information of firms belonging to services industries, such as hotels and restaurants; transport, storage and communication; real estate, renting and business activities; recreational, cultural and sporting activities, and other services activities. The ASS does not survey firms engaged in financial intermediation, public administration and defense, education and social work. Firms with 10 or more employees receive a broader ASS questionnaire than smaller firms. One of the additional questions of the broader questionnaire is the breakdown of firm's sales by destination: domestic and foreign markets. We use this information to identify the exporting firms. Hence, our sample only covers those firms operating in services that have 10 or more employees. The period of analysis is 2001-2007.⁴

Table 1 presents data on the number of firms included in the sample, total employees, value-added and exports per year.⁵ As shown in the table, the average number of firms per year included in the sample lies around 17000, with a minimum of 14040 in the year 2001 and a maximum of 19774 in the year 2007. These figures represent around 1.3% of all firms that belong to the surveyed services industries during the period 2001-2007 (INE database).

⁴ Following strict confidentiality rules, the researcher did not have access to the database, and all the empirical analyses were carried out by INE's personnel in Madrid. The outcome of the empirical analyses was also screened to ensure that no firm could be identified from the results.

⁵ We excluded from the sample those firms with negative value-added, no sales or no purchases.

Figure 3. Share of Spain in world services exports, 1995-2009



Source: World Trade Organization database.

Total employees, which lie, as average, around 2 million per year, account for 52% of all employees in the surveyed services industries. On its hand, the firms included in the sample represent, as average, 29% of the total value-added generated in the surveyed services industries. Finally, our sample covers, as average, 31% of exports recorded by the balance of payments in the surveyed services industries (Bank of Spain database).

Table 1. Description of the sample

	2001	2002	2003	2004	2005	2006	2007
Firms	14040	16706	16568	16872	16765	19027	19774
Employees	1565450	1742066	1881329	1953262	2002497	2244896	2324882
Value-added	65500	77400	84400	89900	96200	112000	124000
Exports	14532	16696	18530	20986	22628	25268	30532

Note: Value-added and exports are in million €

4. Descriptive analyses on services exporters

This section presents some descriptive analyses of exporters in the services industry. First, we analyze the share of exporters in all firms engaged in services, and the percentage that exports represent over firms' turnover. Second, we describe the distribution of exports across industries and firms. Third, we measure exporters' weight in total employees and value-added. Finally, we perform a series of descriptive regressions to determine whether exporters have a

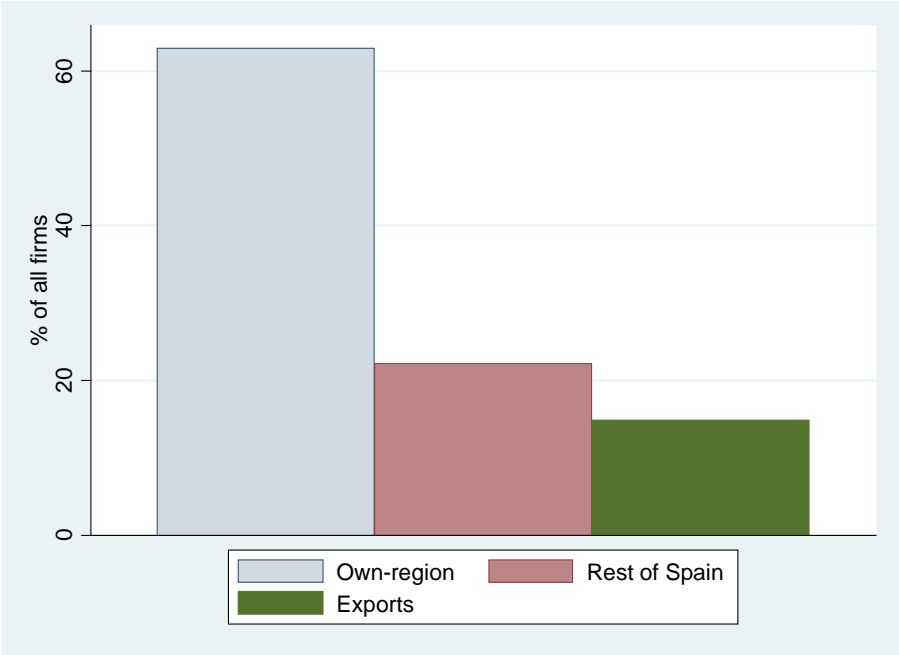
premium in different firm-level characteristics, such as employment or value added, over non-exporters.

4.1. Percentage of exporters and export-intensity

Figure 4 presents the share of exporters in the firms engaged in services in 2007, the latest year available in our sample. As shown in the figure, exporters constitute a small percentage of all firms: 14.9%. This percentage is half the share of exporters in the Spanish manufacturing industry: 29.8% (Fariñas and Martínez-Marcos, 2007). The percentage of firms that only export to the European Union, 8.4%, is larger than the percentage of firms that also export to other countries: 6.5%. We can observe that the majority of Spanish firms in services only sell in the region where they are located: 62.9%; only 22.2% of firms also sell in the rest of the Spanish market.

We have to point out that Spain experienced a construction-related economic during the period 2001-2007. High demand in the domestic market might have reduced incentives for services firms to look for new foreign markets, reducing the percentage of exporters. In fact, in the year 2001, the percentage of exporters was 17.6%, almost 3 percentage points higher than in 2007. This percentage declines as Spain gets into the economic boom, with the lowest percentage of exporters happening in the year 2006: 14.5%.

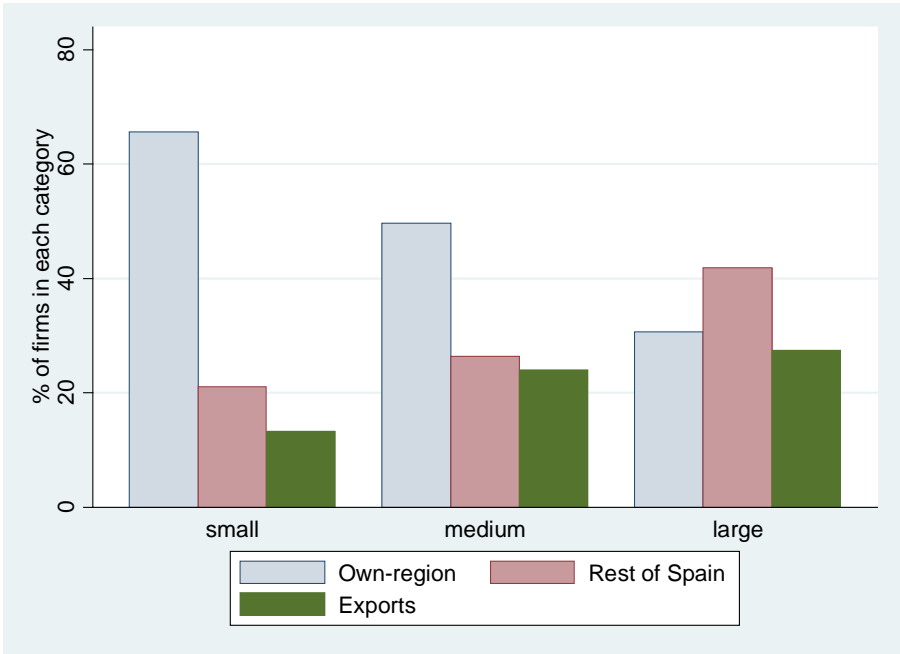
Figure 4. Share of exporters in services, 2007



Note: Percentages are weighted by sample to population elevation factors.

It is interesting to observe that participation in foreign markets is tightly linked to the size of firms, measured by the number of employees. As shown in Figure 5, the share of exporters among small firms (less than 50 employees), is lower than among medium firms (between 50 and 249 employees), and even smaller than across large firms (more than 249 employees). We should point out that not only exports, but also the share of firms that sell in regions different to the one they are located is linked to firms' size. Whereas 21.1% of small firms venture into other Spanish regional markets, the share rises to 26.3% for medium firms and to 41.9% for large firms. This result point out that entering other Spanish regions' markets impose additional costs on firms, and those additional cost seem to be more easily borne by larger firms.⁶

Figure 5. Relationship between exporters' share and firm size



How does the percentage of exporters in Spain compare to other countries? For the United Kingdom, Breinlich and Criscuolo (2011) report a 6.2% of exporters of services for the year 2005.⁷ However, this percentage is calculated over all firms that operate in mining, manufacturing and services industries. If we only consider firms operating in business services, the percentage of exporters raises to 12%, a share more similar to that found for Spain. Eickelpasch and Vogel (2011), using a sample of services industries very similar to that used in our study, report a 14% figure for Germany. In contrast, Conti et al. (2011), which use a much smaller sample of firms, report a 24% figure for Italy. This higher

⁶ Holmes and Stevens (2010) find similar results for US manufacturing industries.

⁷ Table 3 - (1) Share of firms, adding figures for EnoI and EandI.

percentage might be explained by the over-representation of large firms in their study.⁸ Jensen (2008) reports the share of exporters in selected business services in the US, such as software design or architectural, engineering and related services. Although shares vary notably across industries, the average lies around 8%.

We can observe that there are large differences in the share of exporters across industries (Table 2). The highest percentage of exporters is found in air transport, where more than 72% of firms have supplied services to foreign firms or residents. Other transport activities, such as water and land transport also report high exporter percentages (25 and 30 respectively). We should stress, as well, the high percentage of exporters in skill-intensive activities, such as computer (33%) and research and development (46%). The percentage of exporters is also above the average among core business services, such as advertising (24%), architecture and engineering (20%), consultancy (22%), legal activities (22%) and market research (41%). In contrast, the share of exporters is very low in other personal service activities (3%), other business services (6%), accounting (7%) and real estate activities (7%). The share of exporters

Table 2. Share of firms by trade status in services industries, 2007 (% of total firms)

Branch	Own-region	Rest of Spain	Exports
Accounting	62.5	30.9	6.6
Advertising	27.5	48.8	23.7
Air transport	15.0	12.5	72.5
Architecture and engineering	31.6	48.3	20.1
Computer and related activities	26.6	40.4	33.0
Consultancy	39.7	38.5	21.7
Hotels and restaurants	83.2	6.4	10.4
Land transport	38.0	36.8	25.2
Legal activities	63.2	14.8	22.0
Market research	19.0	39.7	41.3
Other business services	73.5	20.1	6.4
Other personal service activities	83.2	13.6	3.3
Other transport activities and of travel agencies	33.6	31.6	34.8
Post and telecommunications	44.9	34.4	20.7
Real estate activities	74.2	18.3	7.5
Recreational, cultural and sporting activities	73.1	16.5	10.4
Renting of machinery and equipment	49.3	38.8	11.9
Research and development	16.0	37.5	46.4
Technical testing and analysis	31.1	53.5	15.4
Water transport	49.0	20.6	30.4

Note: Percentages are weighted by sample to population elevation factors.

⁸ Breinlich and Criscuolo have a sample that includes both small and large firms. Eickelpasch and Vogel (2011) have a sample of firms with an annual turnover over 250,000 euros per year.

for hotels and restaurants is also very low (10%). This figure strikes as too low for a touristic country as Spain. It might happen that some firms, in particular restaurants, do not report as exports the services provided to foreign guests, which would constitute a Mode 2 of exports according to GATS nomenclature.⁹

To finish this section, we analyze exporters' trade-intensity, which is calculated as the share of exports over total turnover. As shown in Table 3, among exporters, exports represented 28% of their turnover. This figure is similar to that found by Breinlinch and Criscuolo (2011) for UK firms. In contrast, Conti et al. (2010) report a much lower figure for Italian firms: 6.5%. However, surprisingly, trade intensity among Spanish services firms is larger than among Spanish manufacturing firms: 21.4% (Fariñas and Martín-Marcos, 2007).

We also observe differences in export-intensity across services industries, although the variation coefficient is lower than the one for exporters' share in total firms. Air transport is

Table 3. Trade intensity: Exports as percentage of total turnover, 2007

Total	27.9
Accounting	36.0
Advertising	13.5
Air transport	46.7
Architecture and engineering	27.1
Computer and related activities	39.1
Consultancy	27.9
Hotels and restaurants	41.9
Land transport	33.6
Legal activities	28.0
Market research	23.8
Other business services	23.1
Other personal service activities	6.4
Other transport activities and of travel agencies	36.1
Post and telecommunications	7.3
Real estate activities	35.1
Recreational, cultural and sporting activities	14.3
Renting of machinery and equipment	21.5
Research and development	30.0
Technical testing and analysis	26.2
Water transport	33.7

Note: Percentages are weighted by sample to population elevation factors.

⁹ Mode 1 refers to services crossing borders (a software program designed in Spain and sold to a Mexican firm), Mode 3 when the service is provided by an offshore affiliate (a branch of Banco Santander providing financial services in Brazil), and Mode 4 when persons move temporarily to provide the service (the Spanish ACS construction firm moving his workers to build a bridge in Portugal).

the industry where exports represent the highest share of turnover (46.7%). Other transport activities also have export-intensity levels that are above the mean. We should stress the high export-intensity for hotels and restaurants (41.9%), which is line with the weight that tourism has in Spain. Some business services, such as accounting (36.0%), and computer services also have large export intensities. At the low end, we find other personal service activities (6.4%) and post and telecommunications (7.3%).

4.2. Concentration of exports by industries and firms

Table 4 presents the share of each industry in total exports. As shown in the table, the bulk of the trading activity is concentrated in the transport industry, which accounts for 47% of all exports. We should highlight, as well, the high share of computer and related services (15%), and hotels and restaurants (10%). In contrast, most of the highly skilled business services, except for architecture and engineering, represent a very small share of exports.

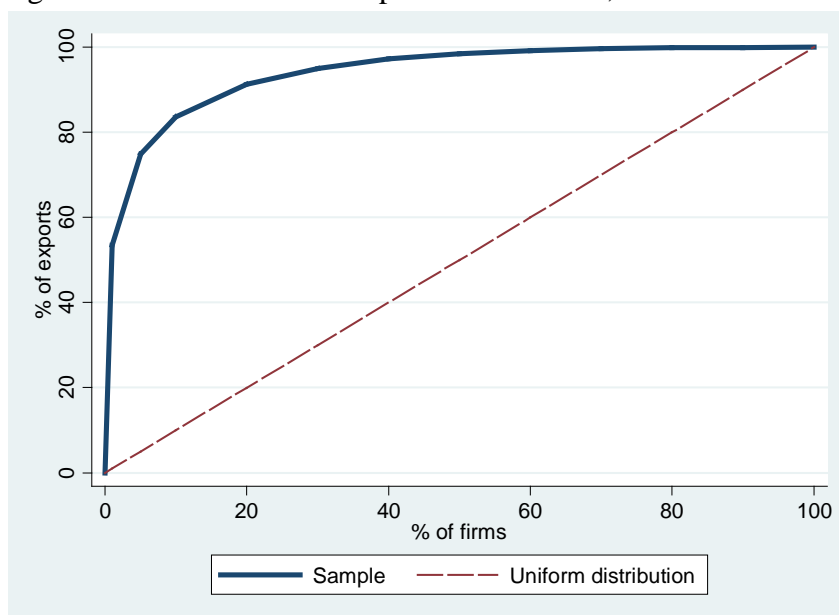
In addition to the distribution of exports across industries, we also analyze the distribution of exports across firms. As shown in Figure 6, exports of services are highly concentrated in a

Table 4. Share of industries in total exports, 2007 (%)

Industries	Share in exports
Accounting	0.9
Advertising	2.5
Air transport	13.0
Architecture and engineering	7.7
Computer and related activities	14.6
Consultancy	0.9
Hotels and restaurants	10.4
Land transport	7.9
Legal activities	1.5
Market research	0.3
Other business services	1.8
Other personal service activities	0.1
Other transport activities and of travel agencies	24.5
Post and telecommunications	5.7
Real estate activities	2.4
Recreational, cultural and sporting activities	2.1
Renting of machinery and equipment	0.9
Research and development	0.9
Technical testing and analysis	0.4
Water transport	1.5

Note: Percentages are weighted by sample to population elevation factors.

Figure 6. Concentration of exports across firms, 2007



few number of firms. The top 1% of exporters account for more than half of total exports, the top 5% for almost 75% of total exports, and the top 10% for almost 84% of total exports. Nevertheless, this concentration is lower than in merchandises, where 1% of firms accounted for 66% of all exports in 2007 (Secretaría de Estado de Comercio, 2010).

4.3. Exporters' weight

This section analyzes the share of exporters in total number of employees and value-added. As shown in Table 5, the share of exporters in total employees and value-added is larger than their share in total firms. In particular, whereas exporters only represented 14.9% of all firms in 2007, they accounted for 25.1% of total employees and 38.9% of total value-added. The relatively higher weight of exporters is especially salient in some business services, such as architecture and engineering, consultancy, legal activities and market research. In contrast, in some industries, such as hotels and restaurants, and land transport, exporters' weight is below their share in the total number of firms.

The figures presented in Table 5 highlight substantial differences between exporters and non-exporters. In the next section, we analyze these differences in more detail, running descriptive regressions to highlight whether exporters have a premium on different firm characteristics over non-exporters.

Table 5. Share of exporters in total employees and value-added, 2007

Industry	Employees	Value-added
Total	25.1	38.9
Accounting	20.6	26.5
Advertising	30.0	34.4
Air transport	55.2	70.3
Architecture and engineering	98.0	98.3
Computer and related activities	40.5	46.7
Consultancy	77.3	76.6
Hotels and restaurants	8.7	7.0
Land transport	20.5	24.5
Legal activities	56.6	68.7
Market research	70.7	72.3
Other business services	6.7	11.1
Other personal service activities	55.9	65.7
Other transport activities and of travel agencies	37.4	36.5
Post and telecommunications	19.4	24.6
Real estate activities	44.0	51.3
Recreational, cultural and sporting activities	28.6	45.4
Renting of machinery and equipment	23.6	26.6
Research and development	22.6	38.0
Technical testing and analysis	13.6	27.9
Water transport	6.3	13.9

Note: Percentages are weighted by sample to population elevation factors.

4.4. Exporters premia

Following the methodology introduced by Bernard and Jensen (1995), we run a set of descriptive regressions to study whether exporters are different to non-exporters with respect to different firm characteristics.

The descriptive regression is defined as follows:

$$\ln(\text{Firm} - \text{Level} - \text{Variable}) = cte + \text{Exporter} + \beta_b + \beta_y \quad (1)$$

where *Firm-Level-Variable* is the variable to be analyzed in the descriptive regression (e.g. employees, value-added, ...) and *Exporter* is a dummy variable that takes the value of one if the firm exports. As firm-level variables are in natural logarithms, *Exporter* captures the percentage difference between exporters and non-exporters in the analyzed characteristic. The descriptive regression also controls for 4-digit NACE industry fixed effects (β_b), and time fixed effects (β_y). For the empirical analysis we pool all observations for the period 2001-2007. Except for the number of employees, the rest of firm-level variables are transformed into constant values using the appropriate deflators.

Table 6 presents the results of the descriptive regressions. We analyze exporters premium in nine different firm-level variables: employees, turnover, value-added, labor productivity, wages per employee, investment, research and development expenditure as percentage of total sales, differentiation expenditures as percentage of total sales and gross-profit.¹⁰ As shown in the table, exporters have a sizable premium relative to non-exporters in all variables, except for gross-profit.¹¹ Our results are in line with previous studies that have analyzed exporters' premia both in manufacturing (Bernard and Jensen 1995 and 1999; Bernard and Wagner, 1997; Mayer and Ottaviano, 2007; Mûuls and Pisu, 2009) and in services (Breinlich and Criscuolo, 2011). With respect to gross-profit, Vogel and Wagner (2010) find a small negative coefficient for services exporters. Table 6 shows that the highest differences are found in turnover, value-added, investment and research & development. In contrast, the lowest differences are found in differentiation and wages per employee. Finally, the absence of statistically-significant difference in gross-profit might point out that the larger labour productivity in exporters is compensated by higher wages.

Table 6. Descriptive regressions. Characteristics of firms per trading status

	Coefficient Exporter	N° of observations	R ²
Employees	0.27 (0.01)***	119032	0.17
Turnover	0.71 (0.01)***	119240	0.20
Value added	0.56 (0.01)***	119411	0.20
Labor productivity	0.27 (0.01)***	118333	0.34
Wages	0.18 (0.00)***	116326	0.46
Investment	0.50 (0.02)***	92733	0.14
R&D	0.40 (0.01)***	4650	0.28
Differentiation	0.12 (0.01)***	106165	0.12
Gross-profit	0.25 (0.27)	119636	0.07

Note: Table reports results for weighted least squares regression using sample to population elevation factors. All dependent variables, except for gross-profit, are in natural logs. All regressions include 4-digit NACE branch and time dummies. Robust standard errors in brackets. *** statistical significant at 1%.

Due the central role that productivity plays in the new-new trade theories, it is important to stress that, according to our results, Spanish exporters of services have a labor force which is 27% more productive than non-exporters.¹² Figure 7 presents the distribution of labor productivity for exporters and non-exporters. We can observe that the curve of exporters is

¹⁰ Gross-profit is defined as (value_added-wages)/(sales-net change in inventories).

¹¹ We exclude observations that lie two standard deviations above the mean or two standard deviations below the mean. Differences in the number of outliers explain why some regressions are performed with more observations than others. In addition to that, very few firms report data on research and development expenditure.

¹² We could not calculate exporters' premium in total factor productivity, because the ASS does not provide any data on capital.

situated to the right of the curve for non-exporters. Moreover, if we further disaggregate firms' trade status (Figure 8), we observe that the curve shifts to the right as firms enter new markets.

Figure 7. Distribution of firms by labor productivity. Exporters vs non-exporters

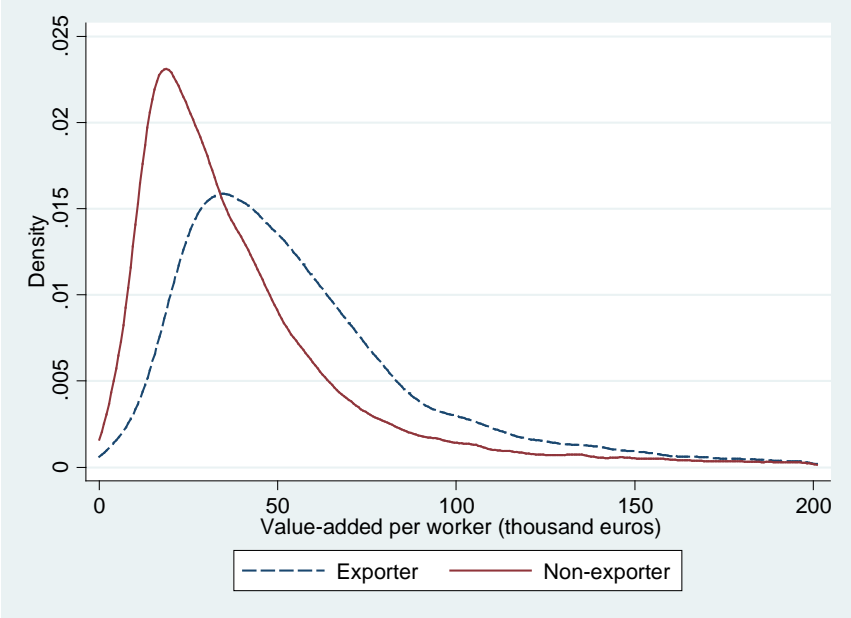
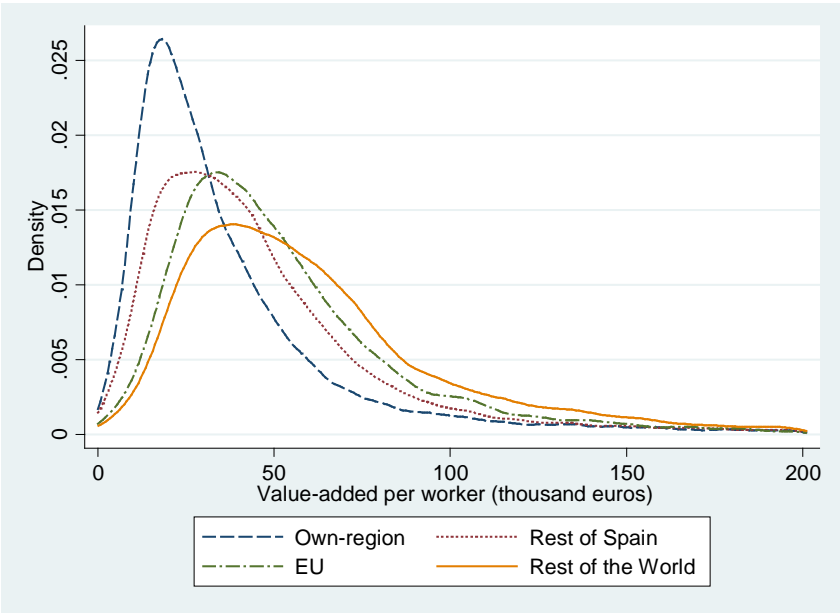


Figure 8. Distribution of firms by labor productivity and trade-status, 2007



5. Export participation and intensity

In this section we analyze the factors that may influence the participation of services firms in export markets, and the intensity of exports over total turnover. This analysis is very relevant because both the number of firms that participate in exports (extensive margin) and the amount exported by each firm (intensive margin) might play an important role in explaining the evolution of exports. The analysis carried out for Spanish merchandises point out that both margins contribute equally to the evolution of exports in the medium term (de Lucio et al., 2011). For services, results from balance of payments data suggest that the intensive margin plays a larger role than the extensive margin in year-by-year changes, although the contribution of the latter increases for longer time periods (González and Rodríguez, 2010).

From the policy perspective, it is also important to identify the characteristics that allow firms to participate and excel in foreign markets. As Wagner (2008) points out, identifying the relevant characteristics, governments aiming to increase exports might focus their assistance in firms that present those characteristics. If governments aim to increase the share of firms that participate in labor market, the policies might be directed to nurture the relevant characteristics in those firms that lack them.

Export participation

To analyze the factors that may influence the decision to export, we use the model developed in Roberts and Tybout (1997). In this model, a firm sales to a foreign market if export revenues outweigh export costs. Analytically:

$$\begin{cases} y_{i,t} = 1 \text{ if } \mu_t + \beta' X_{i,t} + \alpha y_{i,t-1} + \varepsilon_i \geq 0 \\ y_{i,t} = 0 \text{ otherwise} \end{cases} \quad (2)$$

where $y_{i,t}$ denotes export status, which takes the value of 1 when the firm exports and 0 otherwise. The variation in the profitability of the export activity can arise from three sources: macro conditions (μ_t), observable differences in a firm's characteristics ($X_{i,t}$), and export sunk costs ($y_{i,t-1}$). In the empirical model, macro conditions (exchange-rate movements, business cycle, credit-market conditions, trade-policy conditions and other time-varying factors) are captured with a year-specific dummy variable. Firm characteristics include variables that the literature has identified as influencing firms' export status, and are available in the ASS: firm size (proxied by the number of employees), labor productivity (proxied by value-added per employee), labor quality (proxied by average wages), differentiation level (proxied by the advertisement expenditures as percentage of total sales), and external financial dependence, calculated as the share of investments that are not financed by operating profits. In addition to these firm-specific variables, we also include dummy variables for services industries at the 4-digit NACE. Finally, export sunk costs are proxied by the persistence of the export status. If

persistence is prevalent (α is positive and large), it will denote that exporting involves large sunk costs.¹³

Due to dynamic nature of the export decision model, we have to remove those firms that only appear once in the sample.¹⁴ These firms constitute a large share of our observations, because the Spanish Statistical Institute only keeps with certainty in the sample those firms that overcome a certain employment threshold. Hence, we should be cautious when extending our results to the behavior of small firms. To take advantage of the panel nature of our dataset, we estimate a random-effects probit model. As shown in Table 7, all firm-characteristics, except for labor productivity, enhance the probability of participating in foreign markets, and are statistically significant. We observe that having previous export experience has a very strong positive impact on the probability to export. This result points out that exporters of services might also encounter sunk-costs in the export activity. We also find that size, skill-intensity of the labor force and investment in differentiation rise firms' probability to enter foreign markets. On the other hand, financial dependence does not hinder firms' opportunities to break into new markets. Surprisingly, we find that labor productivity, although positive, is not statistically significant.

Table 7. Regression results on export participation

Exporter at t-1	1.22 (0.05)***
Size	0.13 (0.03)***
Labor productivity	0.08 (0.06)
Wages per employee	0.65 (0.09)***
Differentiation level	0.03 (0.02)*
Financial dependence	0.04 (0.02)*
Observations	19835

Note: All dependent variables are in natural logs. All regressions include 4-digit NACE branch and time dummies. Robust standard errors in brackets. *, *** statistical significant at 10% and 1% respectively.

Export-intensity

In this section we analyze the factors that influence the share of exports in total sales. After reviewing different methodologies, Wagner (2001; 2010) shows that this analysis should include observations of exporters and non-exporters (one-step approach), and control for the fractional nature of the variable (that ranges between 0 and 1). In the first econometric analysis, we pool all observations and apply the quasi-likelihood estimation method

¹³ R&D expenditure is another variable that is also included in export-participation models. Although the ASS requests this information, very few firms provide it.

¹⁴ We also remove those firms that disappear from the sample in the period 2001-2007. As previous studies have pointed out (Bernard and Jensen, 2004), including these firms would involve modeling the probability of failing and would complicate substantially the analysis.

developed by Papke and Wooldridge (1996). In the second econometric analysis, we create a balanced panel with firms that report data during the whole period 2001-2007, and apply the pooled fractional probit estimator developed by Papke and Wooldridge (2008).

Table 8 presents the results of both econometric analyses. As shown in the table, when observations are pooled, we find that size, labor productivity, wages per employee and financial dependence are positively correlated with firms' export-intensity. In contrast, the level of differentiation is negatively related with export-intensity. When we reduce the sample to the balanced 7-year panel, along with a severe reduction in the number of observations, we find that size does not longer have a statistical significant effect on export-intensity. The rest of coefficients keep their sign and remain statistically significant.

To sum up, our analyses show that firms characterized by a larger size, higher labor productivity and higher salaries are more likely to participate in export markets and to command larger export-intensities. As the variables that foster export participation are the same as those which foster export-intensity, policies nurturing these variables will have a positive impact both on the extensive and the intensive margin of exports.

Table 8. Regression results on the intensity of exports

	Pooled observations	7-year balanced panel
Size	0.11 (0.01)***	0.10 (0.06)
Labor productivity	0.03 (0.02)*	0.13 (0.04)***
Wages per employee	0.37 (0.03)***	0.38 (0.06)***
Differentiation level	-0.03 (0.01)***	-0.08 (0.02)***
Financial dependence	0.02 (0.01)***	0.04 (0.01)***
Observations	40832	8599

Note: All dependent variables are in natural logs. All regressions include 4-digit NACE branch and time dummies. The 7-year balanced panel regressions also include the average value of each independent variable during the period of analysis as explanatory variables (coefficients not reported). Robust standard errors in brackets. *, *** statistical significant at 10% and 1% respectively.

6. Exports and productivity

As explained in the introductory section of this paper, the likely link between exports and productivity constitutes one of the most important reasons to analyze the characteristics of exporting firms. Based on the evidence obtained in the descriptive regressions, we observe that Spanish exporters of servicers are more productive than non-exporters. As the literature has pointed out (Bernard et al., 2007; Greenaway and Kneller, 2007; Wagner, 2007), exporters productivity-premium may stem from productivity differences that were present before starting to export (ex-ante differences), or from a more efficient capacity utilization and the learning process associated with exporting (ex-post differences). These explanations,

that are not mutually exclusive, call for different policy prescriptions. If differences in productivity are present before exporting, the increase in the economy's overall productivity will be facilitated by policies, such as trade liberalization, that impulse the transfer of resources from less productive firms to more productive firms. In contrast, if the exporting activity raises firms' productivity level, policy should be directed towards eroding barriers, especially those subject to large spillovers, that may preclude the participation of firms in foreign markets (Copeland, 2007).

In this section we perform different empirical tests to analyze the contributions of self-selection and learning-by-exporting to explain the differences in productivity between exporters and non-exporters of services. First, we analyze the differences in productivity between firms that start to export and firms that remain non-exporters. If self-selection explains higher productivity among exporters, this higher productivity had to be present before starting to export. Table 9 presents the differences between non-exporters and new-exporters three years before starting to export, two years before starting to export and one year before starting to export. In addition to the level of labor productivity, we also analyze whether exporters had an ex-ante advantage in productivity growth. We include in the regression equation the size of the firm and 4-digit NACE industries and time dummies as controls. As shown in the table, firms that start to export were already more productive than non-exporters 1 year before starting to export, 2 years before starting to export and 3 years before starting to export. This finding validates the hypothesis that firms self-select into export markets. On the other hand, we do not find that productivity was rising faster among future exporters than among non-exporters. According to this finding, Spanish exporters of services do not seem to prepare for exporting (López, 2009).

Table 9. Self-selection. Exporters' labor productivity premium before starting to export

	Level			Growth		
	1 year before	2 years before	3 years before	1 year before	2 years before	3 years before
Exporter	0.19 (0.01)***	0.17 (0.01)***	0.16 (0.02)***	0.32 (0.31)	-0.04 (0.04)	0.03 (0.05)
Size	0.05 (0.00)***	0.05 (0.00)***	0.04 (0.00)***	-0.06 (0.01)***	-0.09 (0.02)***	-0.03 (0.01)**
R ²	0.39	0.42	0.45	0.00	0.01	0.02
Observations	45148	27214	16629	25575	13297	7898

Note: Size (number of employees) is in natural logs. All regressions include 4-digit NACE branch and time dummies. Robust standard errors in brackets. **, *** statistical significant at 5% and 1% respectively.

To test the learning-by-exporting hypothesis, we analyze whether labor productivity grows faster for firms starting to export relative to non-exporters. Table 8 presents the results for exporters' labor productivity growth premium at the entry year, 1 year later and 2 years later. As shown in Table 10, the exporter coefficient is not statistically significant. According to this result, firms that enter the export market do not experience a larger rise in labor productivity than non-exporters.

Table 10. Learning by exporting. Exporters' labor productivity growth after starting to export

	Entry year	1 year after	2 years after
Exporter	-0.13 (0.09)	-0.18 (0.14)	-0.25 (0.19)
Size	-0.01 (0.03)	-0.06 (0.03)*	-0.10 (0.08)
R ²	0.00	0.01	0.01
Observations	42958	25571	15531

Note: Size (number of employees) is in natural logs. All regressions include 4-digit NACE branch and time dummies. Robust standard errors in brackets. * statistical significant at 10%.

As Wagner (2007) points out, we should take with care the conclusions drawn from these analyses, because non-observable factors, such managerial skills or product-quality, might explain higher labor productivity in some firms, and these factors might be correlated with participating in foreign markets. As this author stresses, the ideal way to determine exports impact on productivity would be to run a controlled experiment where a group of randomly chosen firms were "treated" with exports and another group of firms did not receive any export treatment. Comparing the average change in productivity in the treated and the untreated group, we could determine the role of exports in enhancing labor productivity. Due to the difficulties of running this kind of experiment, empirical studies proxy the treatment methodology matching starters with similar firms that only sell in the domestic market. If starters are matched with very similar non-starters just before entering foreign markets, differences in the evolution of labor productivity may be assigned to the export learning effect.¹⁵

To match starters with non-starters just before exports begin, we use data on firm size, labor productivity, average wages, advertisement expenditures as percentage of sales, financial dependence, and belonging to the same 4-digit NACE services industry. We also include the growth in labor productivity two years before starting to export as a matching variable. We use STATA's `psmatch2` command to match treated and untreated firms, and to analyze whether there are differences in labor productivity between these two types of firms, before

¹⁵ Wagner (2002) is the first to apply the matching methodology to analyze the learning-by-exporting hypothesis. See also Girma et al. (2004) and Yang and Mallick (2010).

and after the export-treatment. We use the one nearest neighbor algorithm to match treated and untreated firms.¹⁶

As shown in Table 11, there are no differences in labor productivity growth between matched export starters and non-exporters before and after starting to export. With respect to the average difference in labor productivity growth one year before the entry year, export starters had a higher productivity growth than non-starters. However, taking into account the standard deviation of the differences between starters and non-exporters, we cannot reject the null hypothesis that the difference in labor productivity growth is zero. With respect to labor productivity growth after starting to export, the difference is negative for the entry year and one year after entering, and positive for two years after entering. However, as in the previous case, we cannot reject the null hypothesis that the difference is zero.

Table 11. Results from the matching analysis

Labor productivity growth	Average percentage points difference between matched export starters and non-exporters	Standard deviation	Number of matched firms
1 year before entry	0.008	0.388	6084
Entry-year	-0.065	0.383	2753
1 year after entry	-0.040	0.466	1477
2 years after entry	0.239	0.461	941

Note: Firms are matched using the 1 nearest neighbor algorithm. The variables that are used to establish the matching are size, labor productivity, wages per employee, differentiation level, financial dependence, labor productivity growth 2 years before starting to export, to belong to the same 4-digit NACE industry and year.

In order to raise the number of observations, first, we removed the labor productivity growth two years before starting to export variable from the list of variables used to match export starters and non-exporters. In a second sensitivity analysis, we match starters and non-starters at the 2-digit NACE level rather than at 4-digit NACE industries. Results do not change.

In addition to labor productivity, we also analyze whether firms that start to export have higher growth in the number of employees and sales relative to non-exporters. As shown in Table 12, the differences between exporters and matched non-exporters are not statistically significant.

¹⁶ Results do not change if we use other matching algorithms, such as 2 and 3 nearest neighbor or Epanenchikov with different bandwidths, and imposing and not imposing common support.

Table 12. Results from the matching analysis for employees and sales growth

	Growth in the number of employees		Growth in sales	
	Average difference between matched export starters and non-exporters	Standard deviation	Average difference between matched export starters and non-exporters	Standard deviation
1 year before entry	0.027	0.274	0.009	0.280
Entry-year	0.019	0.275	-0.070	0.209
1 year after entry	0.025	0.152	0.073	0.323
2 years after entry	-0.077	0.144	0.048	0.114

Note: Firms are matched using the 1 nearest neighbor algorithm. The variables that are used to establish the matching are size, labor productivity, wages per employee, differentiation level, financial dependence, labor productivity growth 2 years before starting to export, to belong to the same 4-digit NACE industry and year.

7. Conclusions

This paper has analyzed the characteristics of exporters of services in Spain, a country which occupies the seventh position in the world ranking of services exporters. Using unique microdata from the Spanish Statistical Institute, we find that exporters of services represent a very small share of firms engaged in services; this percentage is even lower to that found for manufactures. We also find that the participation in the export market varies widely across industries, with high participation for transport, computer, R&D activities and some business services, and low participation in personal services and real estate. In contrast to exporters' share, we find that export-intensity is larger for exporting firms in services than for exporting firms in manufactures. We observe that services exports are concentrated in transport industries, hotels and restaurants and computing. Within these industries a small number of firms concentrate most of exports. Compared to non-exporters, exporters are larger in terms of number of employees and turnover, have higher labor productivity and invest more in capital, innovation and differentiation. We also find that firms' participation in exports markets and export-intensity are related to having larger figures in those variables. Also, we find that exporters were ex-ante more productive than non-exporters. We do not find that exporting helps firms to raise their productivity level.

Our results for services exporters are very similar to that found for manufactures exporters. On the one hand, these similarities vindicate the validity of heterogeneous firm models to describe the behavior of firms in international markets. On the other hand, the similarities allow us to apply the policy-recommendations drawn by previous studies. In particular, previous studies highlight that productivity increases when resources move from less productive firms to more productive firms. Policies that encourage trade-liberalization in

services may work in this direction. Taking into account that overall increases in productivity in developed and developing countries will depend increasingly on the evolution of productivity in services, those policies ought not to be delayed.

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