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# Trading firms in the Spanish service sector

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## **Abstract**

In this study, I analyze the characteristics of trading firms in the Spanish service sector. I reveal that half of the service firms in Spain operate only in their local markets, whereas one-third of the examined service firms trade with non-local areas of Spain, and fewer than 20% of Spanish service firms trade with other nations. Similar to those in the manufacturing sector, trading firms in the service sector exhibit premia relative to non-traders with respect to size, labor productivity and average wages. Larger premia are observed for firms that trade with more distant markets and for firms that participate in bidirectional trade. Service firms that trade with non-local areas of Spain also exhibit similar premia relative to firms that trade only in their regional markets. I demonstrate that compared with non-trading firms, firms that engage in trade with foreign countries are more productive even before they have commenced their trading activities. However, I do not find that the initiation of trade with foreign nations by trading firms is followed by improvements in the productivity of these firms relative to non-trading firms.

## **Resumen**

Este trabajo analiza las características de las empresas que comercian en el sector servicios en España. Mi análisis muestra que casi la mitad de las empresas del sector servicios solamente opera en su mercado regional; un tercio de las empresas comercia solamente con el resto de España y menos de un 20% de las empresas comercia con otros países. Como en el sector manufacturero, las empresas que comercian en el sector servicios tienen un mayor tamaño, son más productivas y emplean a trabajadores más cualificados que las empresas que no comercian. Estas diferencias aumentan si el mercado con el que se comercia es más lejano y si la relación comercial es en dos sentidos (exportaciones e importaciones). Las empresas de servicios que comercian con el resto de España son también más avanzadas que las que operan solamente en su mercado regional. El análisis empírico muestra que las empresas que comienzan a comerciar con países extranjeros ya eran más productivas antes de comenzar a comerciar con estos países. Sin embargo, los resultados no reflejan que la productividad crezca más entre las empresas que han comenzado a comerciar con relación a las empresas que no comercian.

JEL Codes: F14, F19, F23

Keywords: exports, services, firm-level evidence, Spain, productivity, heterogeneity

## **1. Introduction**

The empirical literature indicates that only a small percentage of firms participate in international trade; moreover, among traders, exports and imports represent only a small share of overall turnover. The literature also concludes that trade participation and trade intensity are not random but are associated with larger firm size, greater productivity and higher levels of skill intensity (Bernard et al., 2007; 2012).

Most of the empirical literature addressing the properties of firms that engage in international trade has analyzed manufacturing firms; few studies have examined the characteristics of traders in services. This disparity represents an important shortcoming in the existing literature because services are the most important economic activity in both developed and developing countries and command a growing share of international trade. The first contribution of this study is that it enhances the scant evidence that is currently available regarding the characteristics of traders in services by considering the case of service firms in Spain, which is one of the most important nations in the world with respect to traders in services. To accomplish this examination of Spanish service firms, I analyze firm-level data extracted from the responses to the Annual Survey of Services in Spain over the course of the 2001-2007 period. I assess the trade participation and trade intensity of service firms and determine whether traders exhibit a premium over non-traders with respect to various performance indicators, such as size, productivity and skill intensity. I also examine whether service firms self-select into new trade statuses and whether these firms learn from their trading activities.

My database can differentiate among service firms that trade only in their regional market, service firms that trade with the entirety of Spain, service firms that trade with European Union (EU) countries and service firms that trade with other foreign nations in

addition to EU countries. The second contribution of this study is that this four-tiered market structure is used to determine whether firms that operate in a larger domestic market, a foreign but relatively well integrated market (the EU) or a foreign but less integrated market (the remainder of the world) must possess premia relative to non-trading firms with respect to size, productivity and skill intensity.

I find that the majority of Spanish service firms operate only in their local (regional) markets; in contrast, only one-third of Spanish service firms participate in trade with non-local areas of Spain, and less than 20% of such firms engage in trade with other countries. Trading firms possess premia relative to non-traders with respect to size, labor productivity and average wages. Larger premia are observed for firms that trade with more distant markets and for firms that participate in bidirectional trade (trade involving both exports and imports). Firms trading in non-local areas of Spain exhibit similar premia relative to firms that trade only in their regional markets; thus, this result suggests that the broadening of trading activities within the domestic market presents additional barriers to trade. I also find that firms self-select into more distant markets; however, I do not find evidence of learning by trading.

This study is organized as follows. The next section describes the concept of international trade in services and elucidates the differences between services and manufacturing with respect to international trade. Section 3 presents the data that are used in this study. Section 4 documents certain stylized facts pertaining to traders in services. Section 5 analyzes whether service firms self-select into trade and whether services firms learn from trading. Section 6 concludes the study.

## **2. Services and international trade**

Our impressions of international trade typically involve goods that are loaded onto a ship to be sent to distant countries. We seldom visualize international trade in the context of services, although sea transport itself is a good example of a type of international trade that involves services. Although we do not intuitively associate international trade with services, services nonetheless represented 25% of worldwide trade in 2010 (World Trade Organization, 2011).

The first reason that only weak associations are typically drawn between international trade and services is because of the confusion that arises with regard to the types of transactions that are regarded as trades in services. To clarify this confusion, we must recall that the General Agreement on Trade in Services (GATS) defines four different modes of trades in services. Mode 1 is the cross-border provision of services. In this mode, a supplier and a customer remain in their countries, and a service is transferred from the exporting country to the importing country. For example, an operator in Tangier who answers a phone call from a resident in Spain who inquires about a bank account is exporting a service from Morocco to Spain. Mode 2 refers to situations when the customer moves to the supplier's location to receive a service. If a resident in Hendaye (France) crosses the border to receive a haircut in Irun (Spain), then the hairdresser is exporting a service to France. Mode 3 refers to a commercial presence. This mode of trade in services occurs when a service provider opens a permanent facility in a foreign country. For example, the revenues of a tapas bar in New York that belongs to a Spanish chain are regarded as exports of Spanish services. Finally, Mode 4 refers to temporary movements across national borders by individuals who supply services. For example, when a Spanish doctor temporarily relocates to a German hospital to perform plastic surgery, Spain is exporting services to Germany.

The second reason that only weak associations are typically drawn between services and international trade is that services have only recently begun to be considered tradable. In fact, services do exhibit characteristics that present obstacles to trade. For example, services are not tangible, cannot be stored and frequently require the simultaneous presence in space and time of both the customer and the supplier—this limitation is known as the proximity burden (Francois and Hoekman, 2010). However, during recent decades, certain processes have fostered the tradability of services. First, the spread of the Internet and the adoption of other advancements in information and communication technologies have greatly enhanced the range of services that can be traded internationally. For example, reductions in communication costs have allowed operators in India to assist customers in the US. Using the Internet, an engineer located in the Czech Republic can create a machine design for a Spanish firm and digitally transmit this design to the Spanish firm by attaching the design to an e-mail. Second, substantial recent reductions in travel costs have also contributed to reducing the expenses that are associated with providing services overseas (Jensen, 2011).

Another feature that renders services as less amenable to international trade than manufactured goods is that services encounter more complex trade barriers and those barriers are more difficult to quantify (Grünfeld and Moxnes, 2003). Barriers to trade in services can be imposed through diverse mechanisms, such as qualification requirements, impediments to the promotion of services, price controls, immigration rules or sales restrictions (Walsh, 2008; Borchert et al., 2012). Finally, compared with the provision of manufactured goods, the provision of many services requires a higher degree of interaction between suppliers and customers. Thus, information barriers to trade, such as language discrepancies, might become more acute for services than for manufactured goods, leading to a larger reduction in trade in the former than in the latter.

### 3. Data

The data on service firms that are examined in this study are obtained from the Annual Survey of Services (ASOS), by the Spanish Statistical Institute (INE). The sampled firms are stratified by industry and by number of employees; firms with more employees have a higher probability of being sampled in the ASOS. The industries that are included in the survey are business services, hotels and restaurants, personal services, and transport and storage. Firms that are engaged in financial intermediation, public administration, defense, education or social work are not included in the ASOS. This survey provides data on the turnover, number of employees, wages, and purchases of each sampled firm. However, the ASOS does not provide data regarding capital for surveyed firms; hence, I use labor productivity (value added per employee) as a proxy for firm-level productivity. Firms with no sales, no purchases or no employees, and firms with negative or zero value added per employee, are removed from the sample.

Firms with ten or more employees receive a broader ASOS questionnaire relative to smaller firms. In this broader questionnaire, firms are asked to provide the distribution of their sales across their regional market, the remainder of Spain, EU nations other than Spain, and non-EU nations.<sup>1</sup> This broader questionnaire also asks firms to provide the distribution of their intermediate purchases among these four different markets. We use this information to identify the trade statuses of firms. The period of analysis is 2001-2007.<sup>2</sup> On average, approximately 17,000 firms are included in the sample during each year of this period. Because firms with fewer than ten workers are excluded from these broader questionnaires,

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<sup>1</sup> A firm's regional market refers to its autonomous community. Spain is divided into 17 autonomous communities.

<sup>2</sup> In accordance with the strict confidentiality rules regarding ASOS results, I did not have access to the ASOS database; rather, all of the empirical analyses were performed by INE personnel in Madrid. The outcomes of these empirical analyses were also screened to ensure that no firms could be identified from the analytical results.

the coverage of the sample is low with respect to establishment (1.3%) but high with respect to employment (52%).<sup>3</sup>

It is important to emphasize that the ASOS does not specify whether firms in the service sector trade in services, manufactured goods or both commodities. However, based on the results of previous studies, we expect services to constitute the majority of the commodities that are traded by the surveyed firms, particularly with respect to exports. Haller et al. (2012) demonstrate that if the wholesale industry is excluded (as occurs in the sample of Spanish firms that is examined in this study), then services constitute the highest share of total exports by service firms. In the case of imports, services account for a lower share of total imports than of total exports; for example, in the case of France (the country that is most similar to Spain with respect to the industries that are sampled by the ASOS), service imports represent approximately 60% of all imports by firms that operate in the service sector.

#### **4. Stylized facts pertaining to traders in services**

This section presents certain stylized facts regarding traders in services. First, we analyze the percentage of firms that participate in trade. Second, we calculate the trade intensity across various markets. Third, we describe the concentrations of trade across firms. Finally, we perform a series of descriptive regressions to determine whether trading firms exhibit premia in terms of different performance indicators relative to non-trading firms.

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<sup>3</sup> This information is obtained from the INE database, which is available at <http://www.ine.es>.

#### **4.1. Participation in trade**

As mentioned above, the data that are analyzed in this study are based on questions that ask firms to provide the distributions of their sales and purchases in four different markets: their regional markets, the remainder of Spain, EU nations other than Spain, and non-EU nations. I use these distributions to identify ten trade statuses. The first status (R) designates firms that trade only in their regional markets. Three additional trade statuses are used to designate firms that also trade with areas of Spain outside of their regional markets. In particular, these statuses are used to indicate firms that sell in Spanish areas outside of their regional markets but do not purchase from these areas (ESnoIS), firms that purchase from Spanish areas outside of their regional markets but do not sell to these areas (ISnoES), and firms that both sell and purchase from Spanish areas that are outside of their regional markets (ISandES). Three additional trade statuses are defined to incorporate firms that also trade with EU countries other than Spain: firms that export to these nations but do not import from these nations (EEUnoI), firms that import from these nations but do not export to these nations (IEUnoE), and firms that both export to and import from these nations (EEUandIEU). Finally, firms that trade with non-EU nations are categorized according to three statuses: firms that export to non-EU nations but do not import (EWnoI), firms that import from non-EU nations but do not export (IWnoE) and firms that both export to and import from non-EU nations (EWandIW).

Table 1 presents the distribution of service firms by trade status in 2007, which is the most recent year of data that are examined in this study. As shown in the table, nearly 50% of service firms trade only in their regional markets. This result emphasizes that the provision of services is a highly localized activity. In total, 33% of all sampled service firms trade with areas of Spain that extend beyond their regional markets. In particular, most of the firms in this group both sell to and purchase from these non-local Spanish markets (14%); among one-

way traders, the share of firms that only import from non-local Spanish markets is twice as great as the share of firms that export to non-local Spanish markets. Firms that trade with foreign countries represent only 19% of all sampled service firms. The share of service firms that export to other nations (15%) is larger than the share of service firms that import from other nations (11%). Finally, the share of service firms that engage in foreign trade only with EU nations (11%) is larger than the share of service firms that trade with non-EU countries (8%). Interestingly, the share of service firms that export to non-local regions of Spain (20%) is only slightly larger than the share of service firms that export to countries other than Spain (15%).

The share of exporters is much lower among service firms than among manufacturing firms. Campa (2004) and Mañez et al. (2004) reveal that 47% to 62% of Spanish manufacturing firms are exporters. Even small manufacturing firms that have between 10 and 19 employees (inclusive) demonstrate higher rates of participation in export activities than service firms. This phenomenon suggests that lower barriers to trade are encountered by exporters in manufacturing than by exporters in services.

How does the percentage of traders among service firms in Spain compare with the corresponding percentage in other countries? Using a sample of service industries that is similar to the sample that is used in this study, Eickelpasch and Vogel (2011) report that 14% of German service firms engage in exporting activities. Damijan et al. (2012) observe high export participation rates of 27%, 17% and 53% among service firms in Finland, Ireland and Slovenia, respectively; however, these statistics are obtained from samples that include firms from the wholesale and retail industries, which are characterized by higher export participation relative to the export levels of other service firms. In an analysis of a sample of French service firms that does not include wholesale and retail industry firms, the share of exporters is 15%, which is identical to the share of exporters in the Spanish sample in the

current study. Kox and Rojas-Ramagosa (2010) report that 20% of Dutch service firms engage in exporting activities. Jensen (2011) reports that 5% of business service firms in the US participated in export activities in 2002. Using 2005 data, Breinlich and Criscuolo (2011) report that for firms operating in the business services, computer, and research and development industries in the United Kingdom demonstrate an export participation rate of 12%, although this percentage accounts for only the exporting of services.

Contrary to our results, Damijan et al. (2012) find that the share of importers among service firms is larger than the share of exporters. However, our results are consistent with the conclusions of Breinlich and Criscuolo (2011), who determine that the share of importers is lower than the share of exporters among service firms, although the authors consider only the importing of services.

Table 1 also presents the distribution of firms by trade statuses in the four specific service industries that are examined: business services, hotels and restaurants, personal services and transport and storage. Because of the inherent nature of each industry, the highest share of traders among the examined industries is found in the transport and storage industry; in particular, 38% of transport firms trade with the remainder of Spain, and a remarkable 32% of these firms trade with foreign countries. By contrast, among the examined industries, the hotel and restaurant industry has the highest share of non-trading firms (57%) and the highest share of firms that trade with non-local regions of Spain (28%). However, the personal service industry has the lowest percentage of international traders. The distribution of firms across statuses in the business service industry is similar to the distribution that is observed for all service firms.

## 4.2. Trade intensity

In this section, I analyze the distribution of the sales and purchases of service firms in the four different markets that are identified in the database of this study. I begin by analyzing service firms that sell and purchase only from the Spanish market. As illustrated in Figure 1, during the 2001-2007 period, non-local regions of Spain account for an average of 50% of the sales of these firms. The share of imports from non-local regions of Spain relative to total turnover is much lower (23%). The intensity of exports to the remainder of Spain is similar across industries; by contrast, there are large differences in import intensity across the examined industries: in hotels and restaurants, imports from non-local regions of Spain represent 46% of turnover, but the corresponding percentage is only 8% for personal service firms.

Figure 2 presents the trade intensity of service firms trading with EU countries. Trade intensity declines for both exporters and importers as firms enter more distant markets. For example, for exporters, non-local regions of Spain account for 34% of sales, whereas EU nations other than Spain account for only 22% of sales. For importers, imports from non-local regions of Spain represent 14% of turnover, whereas imports from EU nations other than Spain represent 5% of turnover. The only exception to this trend is the hotel and restaurant industry, whose export intensity with EU countries other than Spain is greater than its export intensity with respect to the remainder of Spain. It should be emphasized that regional markets still account for nearly 50% of the sales of service firms that trade with EU countries other than Spain.

Figure 3 extends the analysis to examine firms that trade with non-EU nations. For these firms, trade intensity again declines as firms enter more distant markets; however, only small differences in trade intensity are observed between non-EU nations and EU nations

other than Spain. Sales in regional markets continue to represent a large share of the total sales of these firms.

To compare my results with the findings obtained for other countries, I calculate the average export intensity for service firms that export but do not import (25%), the average import intensity for service firms that import but do not export (8%), and the average export and import intensities for service firms that engage in both exporting and importing (22% and 10%, respectively). Among the nations that are examined by Haller et al. (2012), France is the most similar to Spain with respect to industry coverage; compared with the French firms assessed by Haller et al. (2012), Spanish firms report much higher export intensities and similar import intensities. Exporters that operate in business service industries in the UK demonstrate larger trade intensity than the examined Spanish firms (36% for firms that are only exporters and 32% for firms that are both exporters and importers), whereas importers that operate in the business service industries in the UK demonstrate trade intensities that are similar to those of the examined Spanish firms (6% for firms that are only importers and 10% for firms that are both exporters and importers).

Finally, the average export intensity of Spanish service firms is 23%, and the average import intensity of these firms is 9%. Notably, the observed export intensity of 23% for Spanish service firms is slightly greater than the observed export intensity of 21% for Spanish manufacturing firms (Fariñas and Martín-Marcos, 2007).

### **4.3. Concentration of trade**

In this section, I analyze the concentrations of trade across the examined Spanish firms. Figure 4 illustrates the concentrations of these firms' sales to non-local regions of Spain and their exports to foreign nations, whereas Figure 5 presents the concentrations of these firms' purchases from non-local regions of Spain and their imports from foreign nations. Both of these figures demonstrate that trade is concentrated in only a few firms and indicate that firms that trade with non-local regions of Spain are more concentrated than firms that trade with foreign countries. More specifically, with respect to sales to non-local regions of Spain, the top 1% of trading firms account for 57% of these sales, the top 5% account for 77% of these sales, and the top 10% account for 84% of these sales; the corresponding statistics for exports to foreign nations are 49%, 71% and 80%, respectively. The level of concentration is even more acute for purchases from non-local regions of Spain: the top 1% of trading firms account for 67% of these purchases, the top 5% account for 84% of these purchases, and the top 10% account for 90% of these purchases. For imports from foreign countries, the corresponding statistics are 56%, 80% and 89%, respectively. Notably, the concentration of exports is lower for service firms than for manufacturing firms. According to the data published by the Secretaría de Estado de Comercio (2010), the top 1% of Spanish manufacturing exporters accounted for 66% of all manufacturing firm exports in 2007.

### **4.4. Trade premia**

Previous studies have indicated that traders possess certain advantages over non-traders with respect to different performance indicators. In this section, I analyze whether trading firms also exhibit premia relative to non-trading firms in the Spanish service sector. I study whether these trade premia vary across markets (non-local regions of Spain, EU

countries and non-EU nations) and directions (unidirectional or bidirectional trade). To estimate trade premia, I use the descriptive regression equation introduced by Bernard and Jensen (1995):

$$\ln Y_{it} = cte + \beta S' + \gamma \ln \text{emp}_{it} + \beta_I + \beta_t + \varepsilon_{it} \quad (1)$$

where  $Y_{it}$  is the performance indicator of interest (firm size, value added per employee or wages per employee) and  $S'$  is a vector of dummy variables. There is one dummy variable for each of the trade statuses defined in section 4.1; firms that provide services only in their regional market (non-traders) constitute the reference status for this analysis. The dummy variable captures the percentage difference in performance between firms of each trade status and non-traders. The estimation controls for firm size (which is proxied by the number of employees), the 4-digit specification for each industry ( $\beta_I$ ) and time ( $\beta_t$ ). For this empirical analysis, we pool all observations for the period from 2001 to 2007. Firm-level variables other than the number of employees are transformed into constant values through the use of appropriate deflators.

We use ordinary least squares (OLS) to estimate the regressions of this study. It is important to emphasize that if there are omitted firm-level characteristics that are correlated with trade status and performance, then an OLS estimation could produce biased trade status coefficients. Hence, regression results should be estimated as correlations rather than as causations. Table 2 presents the results of the estimations. Several conclusions emerge from these results. First, two-way traders always exhibit a premium relative to one-way traders for each of the examined statuses and performance indicators. Second, firms that trade with non-local regions of Spain possess a premium relative to non-traders for each performance indicator that is examined. Trade models that are based on firm heterogeneity reveal that only more productive firms can overcome the additional costs that are involved in trading in new

markets (Melitz, 2003). Based on this prediction, the results of the descriptive regressions suggest that even within the domestic market, the expansion of activities from the regional market to non-local regions of Spain produces additional trade costs. These costs are associated with the larger distances that service suppliers and customers must address to provide or receive a service. Notably, among the performance indicators that are examined, the largest premium for domestic traders compared with non-traders is observed for firm size. This result is consistent with the findings of studies analyzing manufacturing firms, which indicate that firms that ship to more distant destinations in the domestic market are larger than firms that ship to more local destinations in the domestic market (Holmes and Stevens, 2012).

Third, trade premia increase with market distance. Services firms that trade with nations around the world possess premia relative to firms that trade only with EU countries, and firms that trade only with EU countries have a premia relative to firms that trade only in the domestic market. Focusing on firms that engage in both exporting and importing, Table 2 reveals that labor productivity is 200% higher in firms that trade with the EU than in firms that operate only in the domestic market. However, the productivity gap between firms that trade with non-EU nations and firms that trade only with the EU is only 30%. These results suggest that firms require large improvements in productivity to conduct business in foreign markets, even if these markets are relatively well integrated with the domestic market. The access to less integrated markets also demands a sizable improvement in firm productivity levels.

The results for Spanish service firms are consistent with the findings of previous studies on trade premia in either the manufacturing (Bernard and Jensen, 1999; Mayer and Ottaviano, 2007; Mûuls and Pisu, 2009) or service sectors (Breinlich and Criscuolo, 2011; Damijan et al., 2012). It is also interesting to compare the trade premia between these two sectors. In an examination of Spanish firms, Fariñas and Martín-Marcos (2007) demonstrate

that in the manufacturing sector, exporters are 94% larger than non-exporters, are 17% more productive than non-exporters, and pay wages that are 5% greater than the wages that are paid by non-exporters. In this study, I find that among service firms, exporters are 27% larger than non-exporters, are 27% more productive than non-exporters and pay wages that are 18% greater than the wages that are paid by non-exporters. Thus, service exporters demonstrate greater productivity and wage premia relative to non-exporters compared with manufacturing exporters; by contrast, the size premium for exporters relative to non-exporters is lower in service firms than in manufacturing firms. Similarly, Ariu (2012) finds that the labor productivity premium is larger for service exporters than for exporters of manufactured goods.

In summary, we can establish the following facts pertaining to service firms. First, most service firms operate in their regional market. Second, the percentage of international traders is much lower for service firms than for manufacturing firms. Third, trade intensity is inversely related to market distance. Fourth, export intensity is slightly larger for service firms than for manufacturing firms. Fifth, trade is concentrated among only a few service firms, and the level of concentration is higher for domestic trade than for international trade. Sixth, the concentration of exports is larger in manufacturing firms than in service firms. Seventh, traders possess premia relative to non-traders in terms of size, labor productivity and skill intensity; furthermore, these premia increase with market distance and are larger for bidirectional traders than for unidirectional traders. Eighth, service firms confront sizable barriers to trade even when they are simply expanding their activities within the domestic market. Ninth, productivity and wage premia are larger for service exporters than for manufacturing exporters; by contrast, size premia are larger for manufacturing exporters than for service exporters.

## 5. Self-selection and learning by trading

The existence of trade premia has led researchers to analyze whether these premia were present before traders began to participate in new markets or whether they arose as a result of these trading activities. The former alternative, which is known as the self-selection hypothesis, argues that only productive firms are able to absorb the additional costs that are required to enter new markets and continue to remain profitable. The latter alternative, which is known as the learning-by-exporting hypothesis, argues that exposure to new competitors, suppliers and customers prompt firms to become more efficient. The empirical literature includes ample evidence to support the self-selection hypothesis but scant evidence to support the learning-by-exporting hypothesis (Wagner, 2007).

If self-selection is a valid explanation, then future traders must yield better performance indicators than non-traders for a number of years before these future traders began engaging in trade. By contrast, if learning by trading is a valid explanation, then trading firms should improve their performance indicators relative to non-traders after these trading firms have begun their trading activities.

To test these hypotheses, we estimate the following econometric equation:

$$\ln Y_{it} = cte + \beta \text{Switch}_{is} + \ln \text{emp}_{it} + \beta_I + \beta_t + \varepsilon_{it} \quad (2)$$

where  $Y_{it}$  is the performance indicator of interest (size, value added per employee or wage per employee) and  $\text{Switch}_{ist}$  is a dummy variable that takes a value of one if a firm changes its trade status and zero otherwise. The estimation controls for the size of the firm, industry fixed effects ( $\beta_I$ ; the 4-digit code used to specify each industry) and time fixed effects ( $\beta_t$ ).

The primary shortcoming of this analysis is that the number of firms that switch their trade status in the examined Spanish data is small. To enhance the number of switchers, I

perform only two estimations. In the first estimation, I compare firms that have begun trading with non-local regions of Spain with firms that only trade in their regional market (the reference group). In the second estimation, I compare firms that have begun trading with foreign countries with firms that trade only in the domestic market (the reference group). I use five-year cohorts for these estimations.<sup>4</sup> Switchers are defined as firms that possessed the trade status of the reference group in years  $t-2$  and  $t-1$ , switch their trade status at year  $t$ , and maintain their new trade status in years  $t+1$  and  $t+2$ . Firms belonging to the reference group should remain in this group from  $t-2$  to  $t+2$ . To test the self-selection hypothesis we estimate equation (2) at  $t-2$  and at  $t-1$ ; to test the learning-by-trading hypothesis we estimate equation (2) at  $t$ , at  $t+1$  and at  $t+2$ .

Table 3 presents the results of the estimations. As mentioned above, the results from this table should be regarded with great caution because only a small number of firms actually switch their trade statuses. In the first set of estimations, I examine the premia of firms that switch from the regional market to the broader domestic market. Firms that have begun to export to non-local areas of Spain but do not import from these areas (ESnoIS) do not exhibit any statistically significant switching premia relative to firms that trade only in their regional markets neither before switching nor after switching. Firms that have begun to import from non-local areas of Spain but do not export to these areas (ISnoES) exhibit switching premia relative to the reference group with respect to labor productivity and wages per employee. The labor productivity premium is similar both before and after these firms begin to import; the wage per employee premium for these firms increases until  $t+1$  but falls at  $t+2$ . Firms that have begun to engage in both exporting and importing from non-local regions of Spain do not

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<sup>4</sup> There are three 5-year cohorts in the database: 2001-2005, 2002-2006 and 2003-2007.

exhibit any switching premia relative to firms that trade only in their regional markets neither before nor after commencing to trade.

In the second estimation, I analyze whether firms that have begun to trade with foreign countries demonstrate a switching premia relative to firms that trade in the domestic market (either local markets or non-local markets in Spain). To increase the number of switchers, in this analysis, I do not distinguish between the EU market and the non-EU market. In this estimation, all of the examined types of switchers exhibit a premium relative to the reference group with respect to size. For firms that import from foreign nations but do not export to these nations (InoE) and for firms that engage in both exporting and importing with foreign nations (IandE), the size premium increases as firms approach the year that they begin to engage in foreign trade and continues to increase after these firms have commenced their foreign trade activities. Nevertheless, we cannot reject the null hypothesis regarding the equality of coefficients in any of the bilateral tests. Domestic firms that become both exporters and importers also exhibit a premium relative to the reference group with respect to labor productivity and wages per employee in all of the examined periods. In these estimations, we cannot either reject the null hypotheses regarding the equality of coefficients in any of the bilateral tests.

In summary, a shift from operating only in regional markets to operating in non-local markets in Spain is associated with increases in labor productivity and wages per employee only for firms that begin to import from non-local regions of Spain. This result is not consistent with the trade premia documented in section 4.1 for domestic traders versus non-trading firms. As mentioned above, the results from the switching estimations should be regarded cautiously because of the small number of examined firms that alter their trade status. However, switching firms may simply require a large quantity of trading experience to improve their performance indicators. The results of this study indicate that firms that begin

to export and import from foreign markets exhibit premia relative to firms that trade only in the domestic market. These premia were present before the firms that engage in foreign trade had begun their trading activities; thus, the self-selection hypothesis is confirmed. We do not find evidence supporting the learning-by-trading hypothesis. In a previous study, I use a matching technique to analyze whether service exporters learn from exporting (Minondo, 2012); this approach reveals the existence of a degree of learning, although this learning is observed only during the year of entry into foreign markets.

## **6. Conclusions**

In this study, I analyze the characteristics of traders in the Spanish service sector. I find that nearly half of the examined service firms operate only in their regional markets, only one-third of the examined service firms participate in trade in non-local areas of Spain, and fewer than 20% of Spanish service firms trade with foreign nations. The share of exporters is much lower for service firms than for manufacturing firms. This result suggests that barriers to trade may be larger in the service sector than in the manufacturing sector. By contrast, service exporters demonstrate slightly higher export intensities relative to manufacturing exporters. The trading of services is highly concentrated in only a few firms; this level of concentration is higher for imports than for exports and is also higher for trade with non-local regions of Spain than for trade with foreign countries.

I find that firms trading with non-local areas of Spain are larger, more productive and command greater skill intensity than firms that operate only in their regional market. This result suggests that service firms also encounter barriers to trade when they seek to expand their activities within the domestic market. Although trade premia are observed for firms that trade with non-local areas of Spain relative to firms that trade only in regional markets, these

trade premia increase for firms that engage in foreign trade with EU countries and become even larger for firms that trade with non-EU nations.

Finally, I also examine the self-selection and learning-by-doing hypotheses by analyzing firms that switch their trade statuses. The main shortcoming of these analyses is the small number of firms that switch their trade status. Although my findings are accompanied by various caveats, I find that strictly regional firms that begin to trade with non-local areas of Spain do not command any premia (either before or after these firms switch to trading with non-local areas of Spain) relative to firms that continue to operate only in regional markets. However, regional firms that begin to import from non-local areas of Spain possess premia relative to firms that operate only in regional markets with respect to labor productivity and wages per employee. Firms that begin to export to and import from foreign markets exhibit substantial premia relative to firms that continue operating only in the domestic market with respect to all of the examined performance indicators. These premia are similar both before and after the examined firms commence engaging in foreign trade; thus, the results support the self-selection hypothesis.

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**Table 1.** Service firms categorized by trade status in 2007 (% of all firms).

	<b>All firms</b>	<b>Business services</b>	<b>Hotels and restaurants</b>	<b>Personal services</b>	<b>Transport and storage</b>
R	48	47	57	53	30
ESnoIS	6	8	1	3	10
ISnoES	13	7	22	19	5
ISandES	14	19	5	11	23
EEUnoI	5	4	4	2	9
IEUnoE	3	4	4	4	3
EEUandIEU	3	2	0	2	10
EWnoI	3	3	5	2	3
IWnoE	1	1	1	2	1
EWandIW	4	5	1	2	6

Notes: Percentages are weighted by sample according to population elevation factors. R: firms that operate only in their regional markets; ESnoIS: firms that export to non-local areas of Spain but do not import from non-local areas of Spain; ISnoES: firms that import from non-local areas of Spain but do not export to non-local areas of Spain. ESandIS: firms that both export to and import from non-local areas of Spain; EEUnoI: firms that export only to EU nations but do not import from these nations; IEUnoE: firms that import only from EU nations but do not export from these nations; EEUandIEU: firms that both export and import from only EU nations; EWnoI: firms that export to non-EU nations but do not import from these nations; IWnoE: firms that import from non-EU nations but do not export to these nations; and EWandIW: firms that both export to and import from non-EU nations.

**Table 2.** The premia for trading firms.

	Employment	Labor productivity	Wages per employee
ESnoIS	0.25 (0.01)	0.08 (0.01)	0.05 (0.01)
ISnoES	0.16 (0.01)	0.08 (0.01)	0.06 (0.00)
ISandES	0.47 (0.01)	0.13 (0.01)	0.08 (0.04)
EEUnoI	0.34 (0.01)	0.24 (0.01)	0.16 (0.01)
IEUnoE	0.53 (0.02)	0.30 (0.01)	0.22 (0.01)
EEUandIEU	0.56 (0.02)	0.39 (0.01)	0.28 (0.01)
EWnoI	0.39 (0.01)	0.36 (0.01)	0.26 (0.01)
IWnoE	0.68 (0.03)	0.41 (0.02)	0.32 (0.01)
EWandIW	0.87 (0.02)	0.51 (0.01)	0.42 (0.01)
Adj. R-square	0.21	0.36	0.35
Obs.	119,671	119,671	119,670

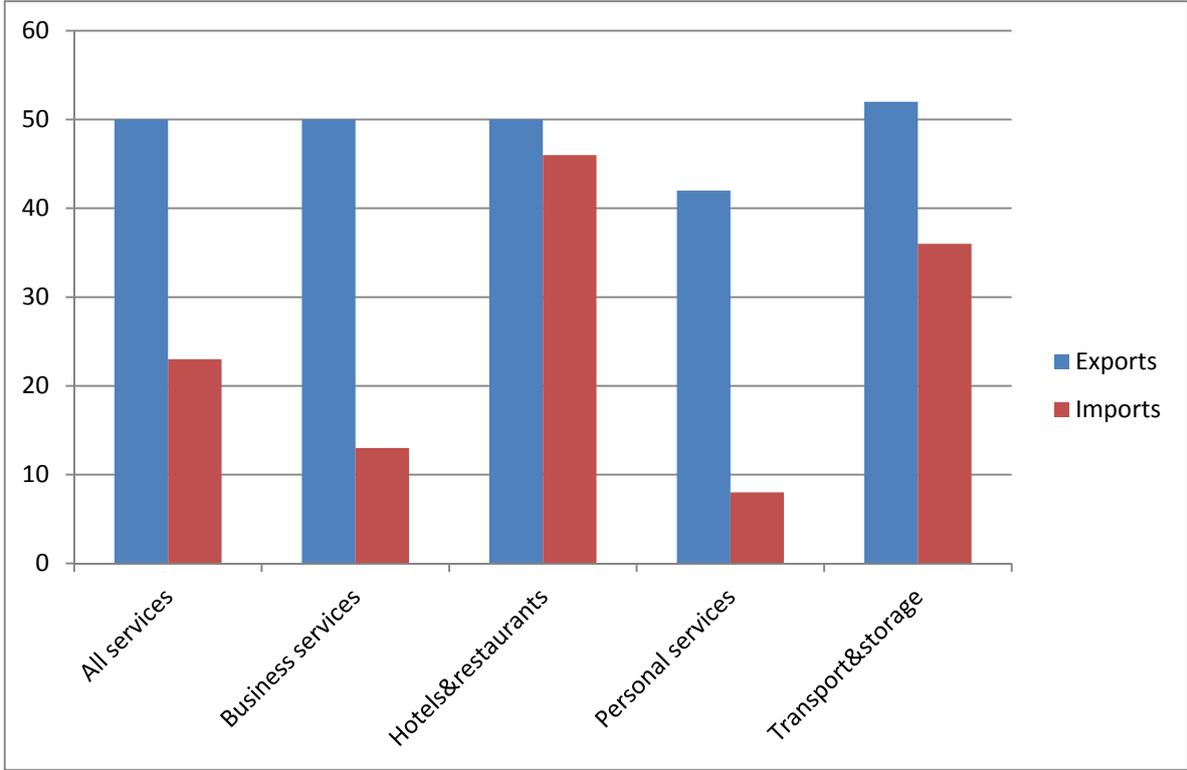
Notes: All of the dependent variables are expressed in terms of natural logarithms. All of the regressions (except for the regression with the number of employees as the dependent variable) include firm size as a control. All of the regressions include industry and time dummies. Robust standard errors are provided in parentheses. All of the coefficients are statistically significant at the 1% level. ESnoIS: firms that export to non-local areas of Spain but do not import from non-local areas of Spain; ISnoES: firms that import from non-local areas of Spain but do not export to non-local areas of Spain; ESandIS: firms that both export to and import from non-local areas of Spain; EEUnoI: firms that export only to EU nations but do not import from these nations; IEUnoE: firms that import only from EU nations but do not export to these nations; EEUandIEU: firms that both export and import from only EU nations; EWnoI: firms that export to non-EU nations but do not import from these nations; IWnoE: firms that import from non-EU nations but do not export to these nations; and EWandIW: firms that both export to and import from non-EU nations.

**Table 3.** The evaluation of the self-selection and learning-by-trading hypotheses.

Domestic vs. Local	Period	Employment	Labor productivity	Wage per employee	Foreign vs. Domestic	Period	Employment	Labor productivity	Wage per employee
ESnoIS	t-2	-0.03 (0.16)	0.06 (0.16)	-0.11 (0.15)	EnoI	t-2	0.31 (0.11)***	0.03 (0.07)	0.06 (0.04)
ESnoIS	t-1	0.12 (0.19)	-0.13 (0.17)	-0.22 (0.19)	EnoI	t-1	0.34 (0.11)***	0.05 (0.06)	0.06 (0.04)
ESnoIS	t	0.18 (0.16)	-0.13 (0.15)	-0.25 (0.16)	EnoI	t	0.33 (0.11)***	0.10 (0.06)	0.08 (0.04)*
ESnoIS	t+1	0.22 (0.16)	-0.15 (0.17)	-0.24 (0.16)	EnoI	t+1	0.30 (0.11)***	0.08 (0.06)	0.08 (0.04)*
ESnoIS	t+2	0.29 (0.20)	-0.13 (0.15)	-0.21 (0.14)	EnoI	t+2	0.31 (0.11)***	0.09 (0.07)	0.05 (0.04)
No. of switchers		14	14	14	No. of switchers		119	119	119
No. in reference group		2111	2111	2111	No. in reference group		7334	7334	7334
ISnoES	t-2	0.08 (0.11)	0.24 (0.07)***	0.16 (0.06)***	InoE	t-2	0.57 (0.21)***	0.05 (0.09)	0.10 (0.06)
ISnoES	t-1	0.09 (0.12)	0.25 (0.06)***	0.15 (0.05)***	InoE	t-1	0.57 (0.21)***	0.02 (0.08)	0.13 (0.06)**
ISnoES	t	0.06 (0.12)	0.25 (0.06)***	0.18 (0.05)***	InoE	t	0.59 (0.20)***	0.04 (0.07)	0.13 (0.05)**
ISnoES	t+1	0.06 (0.12)	0.25 (0.06)***	0.20 (0.04)***	InoE	t+1	0.69 (0.20)***	0.02 (0.07)	0.07 (0.06)
ISnoES	t+2	0.14 (0.12)	0.18 (0.06)***	0.14 (0.05)***	InoE	t+2	0.74 (0.20)***	0.07 (0.07)	0.09 (0.05)*
No. of switchers		66	66	66	No. of switchers		44	44	44
No. in reference group		2111	2111	2111	No. in reference group		7334	7334	7334
ESandIS	t-2	0.23 (0.18)	-0.18 (0.10)*	-0.05 (0.06)	EandI	t-2	0.63 (0.24)***	0.38 (0.13)***	0.25 (0.11)**
ESandIS	t-1	0.20 (0.18)	-0.09 (0.08)	0.02 (0.06)	EandI	t-1	0.67 (0.25)***	0.43 (0.13)***	0.32 (0.12)***
ESandIS	t	0.28 (0.19)	-0.09 (0.14)	-0.05 (0.08)	EandI	t	0.77 (0.27)***	0.38 (0.12)***	0.35 (0.12)***
ESandIS	t+1	0.31 (0.20)	-0.08 (0.12)	-0.04 (0.07)	EandI	t+1	0.78 (0.27)***	0.42 (0.15)***	0.37 (0.13)***
ESandIS	t+2	0.34 (0.20)*	-0.18 (0.09)**	-0.10 (0.07)	EandI	t+2	0.88 (0.27)***	0.32 (0.14)**	0.32 (0.12)***
No. of switchers		24	24	24	No. of switchers		24	24	24
No. in reference group		2111	2111	2111	No. in reference group		7344	7344	7344

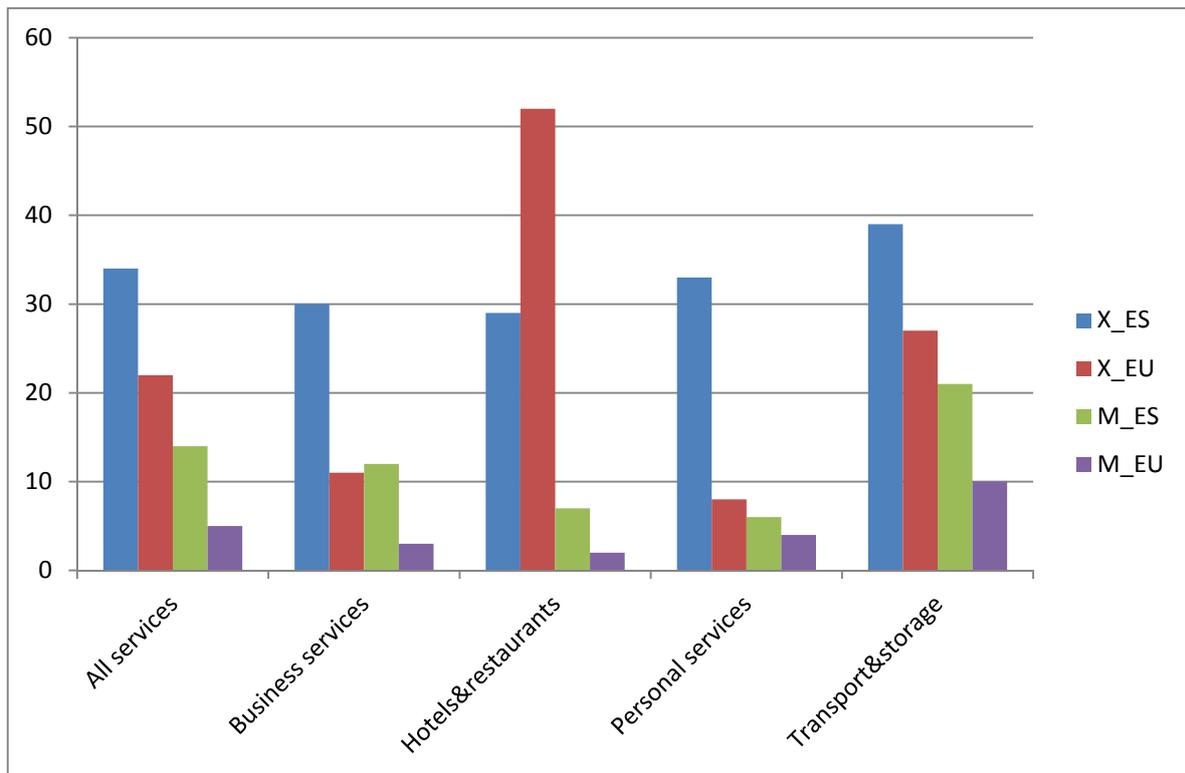
Note: All dependent variables are expressed in terms of natural logarithms. All of the regressions (except for the regression with the number of employees as the dependent variable) include firm size as control. All of the regressions include industry and time dummies. Robust standard errors are provided in parentheses. The symbols \*, \*\*, and \*\*\* denote statistical significance at the 1%, 5% and 10% levels, respectively. ESnoIS: firms that export to non-local areas of Spain but do not import from non-local areas of Spain; ISnoES: firms that import from non-local areas of Spain but do not export to non-local areas of Spain; ESandIS: firms that both export to and import from non-local areas of Spain; EnoI: firms that are exporters but not importers; InoE: firms that are importers but not exporters; and EandI: firms that are both exporters and importers.

**Figure 1.** The trade intensities of service firms that trade with non-local areas of Spain.



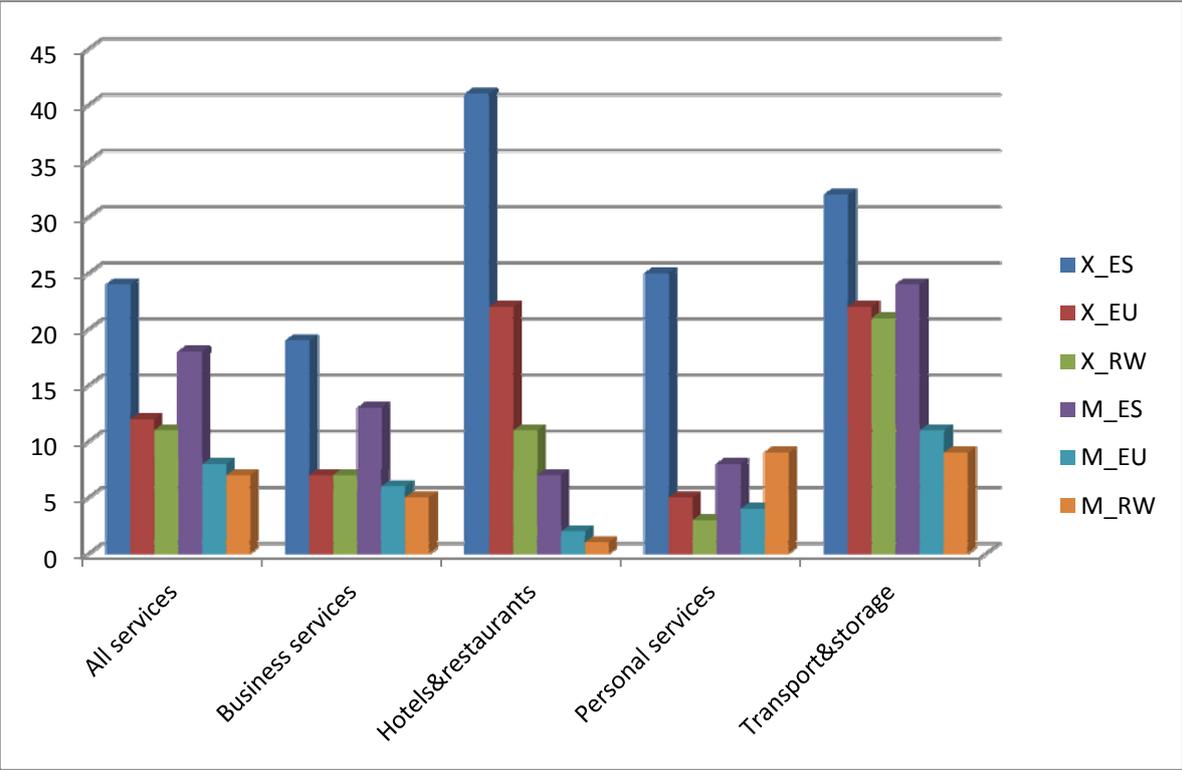
Note: Percentages are weighted by sample according to population elevation factors.

**Figure 2.** The trade intensities of service firms that trade with the European Union.



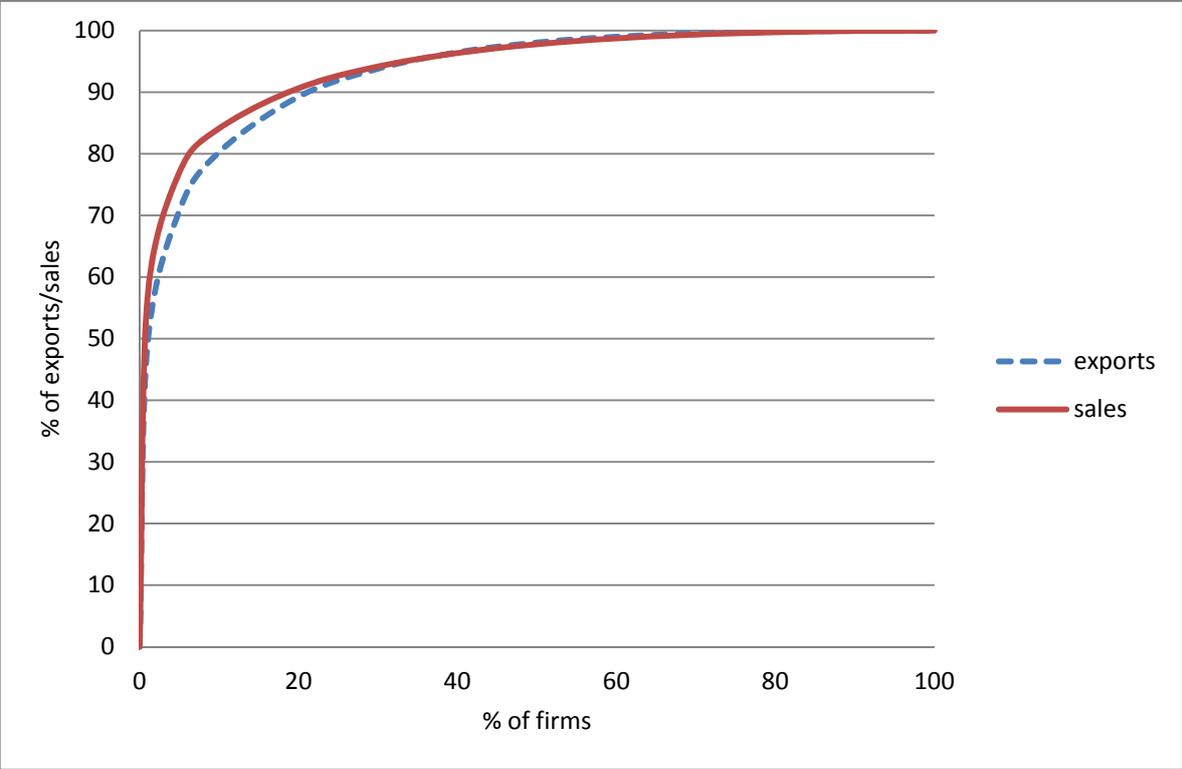
Note: Percentages are weighted by sample according to population elevation factors. X\_ES: exporters to non-local areas of Spain; X\_EU: exporters to the EU; M\_ES: importers from non-local areas of Spain; and M\_EU: importers from the EU.

**Figure 3.** The trade intensities of service firms that trade with the world.



Note: Percentages are weighted by sample according to population elevation factors. X\_ES: exporters to non-local areas of Spain; X\_EU: exporters to the EU; X\_RW: exporters to non-EU nations; M\_ES: importers from non-local areas of Spain; M\_EU: importers from the EU; and M\_RW: importers from non-EU nations.

**Figure 4.** The concentration of sales to non-local areas of Spain and exports to foreign nations across Spanish service firms (2001-2007 averages).



**Figure 5.** The concentration of imports across Spanish service firms (2001-2007 averages).

