

# A League of Their Own: Services Exporters within Goods Exporters\*

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**Abstract:** This paper sheds light on the intertwined nature of goods and services exports at the firm level. In the literature, services are considered as inputs in the production of goods rather than objects of trade in themselves. However, many firms produce and trade services with goods. In this perspective, this paper offers a systematic analysis of services exports in Turkey, which constitutes a relevant developing country example, by using rich, firm-level data for the period 2003-2008. Our results indicate that not only services firms but also manufacturing firms export services. Firms exporting both goods and services are consistently bigger than firms exporting only goods or only services. However, goods exporting multinational firms in Turkey are larger than multinationals that export both goods and services. Goods exporters with a larger size, higher labor productivity and capital intensity are more likely to export services as well. Furthermore, having a wide spectrum of goods to export increases the odds in favor of becoming a services exporter.

**Keywords:** Goods and services exporters, services exports, firm heterogeneity.

**JEL Codes:** *F10, F14*

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# 1 Introduction

*“Gone are the days when services used to be considered as non-tradables.”*  
Pascal Lamy, WTO Director-General

In the recent decades it has become abundantly clear that international trade is not about hauling parceled merchandise from one country to another anymore. We have witnessed a constantly changing boundary between tradables and non-tradables due to technological progress, deregulation and trade liberalization. In other words, during this time period the set of tradables has been expanding because of a continuous transformation of once-nontradable services into tradables.

In the latter half of the twentieth century the services sector has developed into the largest part of the economy with a high contribution to development, trade and employment. At the macro level, more than two thirds of world GDP and nearly half of world employment originate from this sector, and trade in services constitutes nearly one fifth of world trade of goods and services, with two thirds of global foreign direct investment flowing into the sector. At the micro level, all companies coming into existence or staying in business owe their survival to transportation, telecommunication, legal, accounting, financial, computing or other business services. Therefore, it is not conceivable for any country to prosper without having access to a well-functioning services system.

For this reason, there have been global initiatives to liberalize trade in services such as the General Agreement on Trade in Services (GATS). This accord, which came into force in 1995, is the first and only multilateral framework covering the international trade in services. Due to far reaching effects and consequences, it is abundantly clear that any such effort should be guided by a thorough understanding of services trade.

The magnitude and the annual growth rate of services trade have been anything but negligible in the recent years. Growing at a faster pace than goods trade, services trade has almost reached the 10 trillion dollars mark in 2013. Countries show a considerable amount of heterogeneity in their shares of transport services, travel, communication services, construction, financial and insurance services, computer services and other business services including personal, cultural and recreational services. However, there is no doubt that countries with higher goods-export-intensities also show a higher intensity in services exports or vice versa. This, indeed, constitutes the central thrust of the current paper.

This paper attempts to shed light on the intertwined nature of goods and services exports at the firm level. What motivated our current work is the belief that the results of this endeavor will help pave the road in understanding services trade, in particular the services exporters within goods exporters.

The linkage between goods and services sector is an important one in itself; however, this relationship has ramifications for international trade as well for at least two reasons:

Firstly, in the literature, services have mostly been treated as speed highways of international trade. In other words, services are considered as inputs in the production of goods rather than objects of trade in themselves. However, many firms produce and trade services with goods. On the one hand, these firms may be jointly producing and trading services to enhance their competitiveness in the international markets for goods. An example of this might be Caterpillar offering complementary installation and maintenance services of the heavy construction equipment it exports to increase the value of its product to the consumer or differentiate its product from the competitors'. On the other hand, the firm may not engage in bundling goods with services but may be a multi-product firm with independent supplies of goods and services. For example, Proctor and Gamble's exports of Gillette razors probably have nothing to do with co-producing and exporting the soap opera, the Young and the Restless, to the rest of the world. Therefore, treating services as inputs in goods production may lead to an incomplete trade analysis.

Secondly, multilateral liberalization of trade in goods, an ongoing process for the past 50 years, has effects not only on the goods trade but also on the nature and volume of the newly developing business of trading services. Similarly, the massive effort of services liberalization through GATS will likely affect goods trade as well as services trade. Therefore, separating services trade from goods with clear lines may disguise the full effects of liberalization.

In the light of these motives, this paper offers a systematic analysis of services exports in Turkey by using rich, firm-level data for the period 2003-2008. Turkey constitutes a relevant developing country example. The share of services sector in the Turkish economy in 2011 was over 65 percent. In the same year, the value of services trade in total trade has reached 21 percent.

We start by investigating the characteristics of goods and services exporters in Turkey. Exporting is a rare activity but sales of firms in export business constitute 65 percent of the economy: Among all firms in Turkey only 21.8 percent of firms export goods and 1.7 percent engages in services exports while 1.7 percent of firms export both goods and services. Not only services firms but also manufacturing firms export services.

Next, we compare goods and services traders in terms of their size. Firms exporting both goods and services are consistently bigger than firms exporting only goods or only services. This is a very robust result even at the sectoral level. However, among multinational firms located in Turkey goods exporters are larger than goods and services exporters contrary to domestic firms.

Finally, we explore the determinants of the decision to become a services exporter. Our results suggest that goods exporters with a larger size, higher labor productivity and capital intensity are more likely to export services as well. Moreover, a firm's volume of goods exports has a weak positive effect on the probability of that firm becoming a services exporter, while product variety is an important determinant for a goods exporter to become a services exporter.

The map of the paper is as follows: Section 2 summarizes the recent literature on services trade and gives guidance for the rest of the paper. Section 3 offers a discussion of trade in services in general and briefly looks at the global trends.

Section 4 describes our data and presents characteristics of goods and services exporters. Section 5 offers an econometric comparison of goods and services exporters. Finally, Section 6 presents our analysis of the firm-level determinants of the decision to become a services exporter followed by concluding remarks in Section 6.

## 2 Micro-data studies of services trade

Trade in goods has been a lively area of study since the beginning of economics as a distinct discipline. Recently, trade literature has shifted its focus to firm-level goods trade resulting in a diverse set of stylized facts. The firms that involve in goods trade are observed to be larger in size, more productive, utilize capital intensive production techniques and employ higher quality labor compared to the non-traders. On the other hand, the share of firms that engage in goods trade is found to be very low. These stylized facts motivated the most recent big wave in the trade literature; namely, the heterogeneous firm models. For a detailed review of this literature, see Bernard, Jensen, Redding and Schott (2007).

The literature on services trade, however, is sparsely populated and developing only recently, compared to the literature on goods trade. Recent reviews of this literature are provided by Jensen (2011). The first theoretical studies in the literature are on the similarities of and differences between services trade and goods trade. Therefore, earlier discussions are focused on whether the models on goods trade would hold for services trade as well. On the empirical front, the initial studies mainly focus on the analyses that utilize country-sector specific datasets, possibly due to lack of firm-level data<sup>1</sup>.

Studies of services trade with firm-level data, on the other hand, are very recent. Most of these studies are descriptive in nature and highlight the characteristics of the firms that engage in services trade in different countries. As the literature is at its infancy, we provide a comprehensive survey of this literature here.

As one of the initial studies on firm-level services trade, Breinlich ve Criscuolo (2011) provide a micro-data analysis of services traders in the UK. They report that firms that engage in services trade are different from non-traders in their size, labor productivity and other firm characteristics. An important conjecture of their study is that firm heterogeneity exists in services trade firms as well, thereby making the heterogeneous firm models of goods trade literature a good starting point for modeling service traders.

The succeeding studies are in the same spirit and provide information on firm-level services trade mostly for developed countries. Ariu (2012) analyzes the difference between goods trade and services trade using firm level data on Belgium, while Frederico and Tosti (2011) utilize Italian data. By using Japanese data, Tanaka (2011) studies the productivity of international firms in manufacturing and services sectors. Crozet, Milet ve Mirza (2011), on the other hand, show that domestic regulations in the importing markets do matter

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<sup>1</sup> See Breinlich and Criscuolo (2011) for a detailed literature review.

significantly for trade in services and reduce both the decision to export and individual exports using the French firm-level data. Kelle (2012) analyzes services trade activity of German manufacturing firms which account for roughly 25% of service exporters in Germany. Moreover, he analyzes the types of services exported by manufacturers, the industries involved, which services are important in the respective industries, and how firm heterogeneity affects the pattern of service exports. This is a noteworthy study because of its emphasis on the possible complementarities in the goods and services exports in German manufacturing sector.

Grubljesic and Damijan (2011) provides evidence on export behavior of Slovenian manufacturing and services firms, whereas Damijan, Haller, Kaitila, Maliranta, Millet and Rojec (2012) examine trading patterns in five market-services sectors, using data on four EU countries. Kelle, Kleinert, Raff and Toubal (2012), on the other hand, analyze the entry decision of firms that engage in services trade and find that labor productivity and sector and country specific variables are the factors that influence entry. Using data from Spanish firms, Minondo (2012) analyzes the relationship between export status and productivity during 2001-2007, while Malchow-Mollaer, Munch and Skaksen (2013) by using Danish data find that international trade plays a potentially larger role for the productivity development within the services sector than within the manufacturing sector, but it is trade in goods not trade in services that matters most. Finally, Arnold, Javorcik and Mattoo (2011) and Forlani (2010) are the recent studies exclusively focusing on the impact of services trade liberalization on firms and sectors by using firm-level data.

To sum it up, the literature that we have reviewed so far has motivated us to conduct this study for three broad reasons: First, with the clear exception of Kelle (2012), most of the papers discussed above have investigated firm-level services trade of any given firm. However, services exports of goods exporters may be motivated by different reasons and may lead to different consequences for the firm and the sector as a whole as explained in the introduction. Therefore, there is merit in investigating the services export behavior of goods exporters in isolation.

Second, the trade theory has incorporated more heterogeneity in its set-up in the most recent decade than ever due to the stylized facts produced by the empirical work on firm-level goods trade. It seems natural to ask that if the stylized facts of goods trade apply to service trade as well. We have given the very recent panorama of results for developed countries to answer this question and the verdict is that characteristics of firms that trade services are very similar to that of firms that trade goods. However, it is difficult to come to the same conclusion for developing countries because there is hardly any work on their services trade at the firm-level.

Third, services trade is very complex compared to goods trade for reasons that will become clear in the following sections of this paper. The liberalization of this type of trade is a high priority in the WTO agenda. However, in this respect too, services trade differs from goods trade because services are heavily regulated by national governments and liberalization talks in the Doha Round of GATS have been painted with words ranging from unfair gains to international oligopolies to

lost sovereignty. Therefore, there is an apparent need to investigate firm level services trade in depth to gain more traction on policy issues related to services trade. An extended survey on services trade and policy is provided by Francois and Hoekman (2010).

### **3 Exporting services**

#### **3.1 Definition**

The provision of services constitutes an increasing share of the economic wealth of many countries around the globe. Nevertheless, the value of exports of services is two to three times lower than that of goods. This imbalance is partly due to the high trade barriers in services sector as explained in the introduction and partly due to the nature of some services: For example, some financial services are bound by distinct national legislation. Another difference between goods and services owes its presence to the immediacy of the relationship between supplier and consumer. For example, a haircut requires the physical proximity of the service provider and consumer. This proximity requirement implies that many services transactions involve factor mobility. Therefore, services are provided via various modes of supply.

More often than not, services are tailor-made and show a wide range of heterogeneity based on customers' needs and tastes and hence cannot be mass-produced. To trade non-transportable services, the consumer and the service-provider must meet either at the consumer's home country or at the service-provider's. This heterogeneity is just one of the reasons why it is difficult to supply a clean definition of services trade.

Another complication comes from the fact that some services are also often difficult to separate from goods with which they may be associated or bundled. For example, a medical equipment manufacturer can export the good that is produced but also exports the installation and maintenance services with it. International trade statistics simply do not cover all such transactions in detail.

The WTO defines four modes of services supply: (1) Cross-border trade (The service is produced at home and delivered to the foreign customer through telecommunications or mail); (2) Consumption abroad (Foreign customers travel to the home country of the producer to obtain the service); (3) Commercial presence (The service is rendered by a foreign affiliate); (4) Temporary movement of natural persons (An employee of the home firm travels abroad to deliver a service to a foreign customer).<sup>2</sup>

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<sup>2</sup> Since our dataset does not include information on the exact nature of the services trade transactions, it is not possible for us to conduct our analysis using separate GATS modes. For example, among the four modes of services supply defined by GATS, exports in terms of mode 3 are not available in our data. Also, some of the transactions can be carried out using different GATS modes simultaneously. Therefore, we use the GATS definition as a useful guide only.

## 3.2 Global trends

Very few would have predicted the current status of service trade in the world trade today. Services trade has become a vital component of world trade such that the volume of trade in services in 2012 has reached 8.7 trillion dollars. Even this large sum underestimates the importance of services trade because of limitations of international trade statistics in covering all modes of services supply as defined by GATS. Moreover, it is not only the magnitude of this large sum but also the pace of growth of services trade that was unexpected. Its annual growth rate has consistently surpassed that of goods trade in the last two decades. Developing countries have increased their stake in this trade as well and their share in world services exports rose from 23 percent to 30 percent between 2000 and 2012.

Table 1 shows the global trends in services exports in 2011 for 38 select countries. First two columns report the share of services and goods exports in the GDPs of these countries, respectively. While the service exports account to 6% of the world GDP, the goods exports reach nearly 26% of that. There is still quite a bit of room for services to catch up with goods exports, however, given the fast pace of services trade growth around the world, this seems to be only a matter of time.

<Insert Table 1 here>

When the first column of Table 1 is scrutinized more closely, firstly, it is seen that the services-export-intensity of Turkey is close to the world average with a 5% reported rate. Secondly, it is obvious that small open economies of Europe have larger export intensities in services, while services exports sum up to a smaller percentage in the GDPs of large economies such as the USA, Japan or China. Thirdly, some large countries like the UK show high shares of services exports in their GDP. This may be due to the composition of the services exported, which is the next step in this exercise.

The remaining columns of Table 1 show the shares of different services types in the exports of commercial services. More specifically, columns 3-9 of Table 1 show the shares of transport services, travel, communication services, construction, financial and insurance services, computer services and other business services including personal, cultural and recreational services. Here, the countries show a considerable amount of heterogeneity. Countries with a tourism potential end up having the lion share of their services exports in travel, while countries at strategic locations become exporters of transportation services. Countries known to be the financial hubs of their region emerge as financial services exporters while countries that have heavily invested in technological infrastructure end up as communication and computer services exporters.

<Insert Figure 1 here>

Since this paper gets its central thrust from the intertwined nature of goods and services exports, it is a natural last step in this section to explore if there is a correlation between the goods and services trade intensities across the countries reported in Table 1. Figure 1 depicts the scatter diagram of the share of goods and services exports. A quadratic line is fitted to better observe a potential correlation. The figure portrays a positive relationship between the shares of goods exports and services exports in these countries' GDPs. It is not possible to say anything

about the causality of this relation, however, it is discernible that countries with higher goods-export-intensities also show a higher intensity in services exports or vice versa. There are of course outliers in this graph, therefore it needs to be interpreted with caution. However, even with this forethought, it is hard to say that goods and services exports are unrelated.

## 4 Descriptive statistics

### 4.1 A first look at data

The main data sources we used in this study are twofold: the Annual Industry and Service Statistics database and the Foreign Trade Statistics database in Turkey. The Annual Industry and Service Statistics is based on surveys<sup>3</sup> covering the enterprises in the industry and services sector carried out by Turkish Statistical Institute (TURKSTAT). The survey is performed by using the full enumeration method for the enterprises having 20+ employees as well as some regularly followed smaller firms with 1-19 employees. TURKSTAT uses the sampling method for the rest of the small firms to cover the entire Turkish economy. When conducting the 2008 survey TURKSTAT visited 100,152 enterprises.

Our sample covers the period 2003-2008. In our analysis, we include 330,680 observations and exclude small firms represented using the sampling method. The database contains information on employment, wages, investment, value added, sales, foreign ownership<sup>4</sup> and the number of domestic plants of the firms. Our data on services trade come from the same database: firms were asked to report whenever they export and/or import services. Therefore, our services trade data do not carry information regarding the magnitude of services trade but information about the services trade status of the firm. In other words, for any given firm we have information about the extensive but not the intensive margin in regards to services trade. The classification of economic activity used in the study is NACE Rev. 1.1<sup>5,6</sup>.

The second database that we use in our study is the Foreign Trade Statistics database. The main data source is customs declarations and made available by TURKSTAT. The data set includes goods flow, the reference period, customs, commodity code, partner country, the nationality of the means of transport at the frontier, mode of transport, customs procedure, statistical value (export f.o.b./import c.i.f.), net mass (kg), supplementary unit, delivery terms, nature of

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<sup>3</sup> The questionnaires used in these surveys are available from the website of TURKSTAT at [www.tuik.gov.tr](http://www.tuik.gov.tr).

<sup>4</sup> Until 2006 the surveys did not include any information on foreign ownership in services sectors. The foreign ownership question has been included in the survey in 2006.

<sup>5</sup> NACE is derived from the French "Nomenclature statistique des Activités économiques dans la Communauté Européenne" (Statistical Classification of Economic Activities in the European Community).

<sup>6</sup> We can access 2009 survey data, however, we do not include those observations in our analysis, as the new dataset is reported in NACE Rev. 2 classification, which makes 2009 data not comparable to 2003-2008 sample. We considered merging observations from year 2009 with our dataset; however, the incompatibility of these two different industry classifications caused a considerable loss of observations.



transaction and type of payment. The classification used for compiling Turkey's foreign trade statistics is the Harmonized System (HS) 12-digit. We merge these two datasets to obtain data on goods trade, services trade and firm characteristics. We group the firms as: goods-exporters, *G\_E*; service-exporters, *S\_E*; exporter of both goods and services, *Eboth*.

We use several variables to reflect the characteristics of the firm in the analysis. *Sales*, *Employment*, *Large* and *Medium* represent the size of the firm. *Sales* is the gross sales of the firm from all its operations and deflated by the corresponding year's consumer price index. *Employment* is the total number of employees working for the firm. *Large* takes the value 1 if the number of employees of the firm is greater than 100 and 0 otherwise. *Medium* takes the value 1 if the number of employees of the firm is between 50 and 100 and 0 otherwise. Next, we use *Capital Intensity*, which is the capital-labor ratio, where capital is calculated by perpetual inventory method in real terms. In the database, we do not have any variable that would reflect the quality of human capital in the firm. We use *Wages*, deflated by consumer price index, as a proxy for the quality of human capital. Labor productivity in real terms is used as our *Productivity* variable. *Sales*, *Employment*, *Capital Intensity*, *Productivity* and *Wages* are in their logarithmic forms.

*MNE* is a dummy variable which takes the value of 1 if the firm has at least 10 percent foreign ownership and 0 otherwise. Finally, *#Plant* is a variable to proxy for the local network of the firm and shows the number of domestic affiliates.

On the trade side, *Export Value* is the current value of total exports of a given firm. The variable is deflated by the export price index and used in logarithms. The other two related variables are *#Products* and *#Destinations* which show the total number of exported products and the number of export destinations, respectively, and used in logarithms.

The database we use in this study has several advantages. Firstly, it is the census data and contains all firms with 20+ employees in the Turkish economy. Secondly, our trade data cover the entire universe of goods traders in Turkey. Thirdly, all the firms that engage in services trade are included in our dataset. In other words, the trade data in our analysis is comprehensive at the firm-level. The completeness and the consistency of our data are our main strengths here. Some of the previous studies use extensive data sampling. Some of them only cover goods and services exports above a certain threshold and thus do not reflect the complete export behavior among the firms. Some of them use services trade data reported in conjunction with the goods trade. In other words, there is no record of a separate transaction for service trade.

Summary statistics and panel characteristics of our data are provided in Appendix Table A1 and Table A2, respectively.

## 4.2 Characteristics of goods and services exporters

Trade is a rare activity in almost all countries. In the US, only 18 percent of firms engaged in goods exports in 2002 as reported by Bernard, Jensen, Redding and Schott (2007). As there are more barriers for services exports, a smaller portion of

firms exports services in many countries. Breinlich and Criscuolo (2011) state that trade in services only accounts for 8.1 percent of all the firms in the UK.

Exports in the Turkish economy is no exception in this regard. Among all firms in Turkey only 21.8 percent of firms export goods and 1.7 percent engages in services exports in 2003-2008 period as presented in Table 2. On the other hand, 1.7 percent of firms export both goods and services.

Most of the goods exports take place in the manufacturing sector. Within sub-categories of the manufacturing sector, across the board more than 30 percent of the firms engage in goods trade. Within the services sector, on the other hand, the wholesale & retail sector has the highest share of firms that export goods with 17.6 percent.

Similar to the fact that goods trade occurs mainly in the manufacturing sector, the significant bulk of services trade takes place in the services sector. The share of services exporters in transport (22.4 percent) and computers and R&D (16.8 percent) sectors are significantly higher than those in the rest of the services sectors. On the other hand, it is not only the firms in the services sector but also the firms in the manufacturing sectors engage in services trade. It is observed that high-tech firms in the manufacturing sectors (9.7 percent in total) tend to export services more. This fact is in line with the literature: Borchsenius, Malchow-Moller, Munch and Skaksen (2010) suggest that while 80 percent of services imports and over 90 percent of services exports take place through firms in the services industries; the rest of services trade in the Danish economy takes place through the manufacturing firms.

<Insert Table 2 here>

Although the number of exporters is small, they account for a significant share of economic activity measured by sales as presented in Panel 2 of Table 2. Although the share of exporters is only 25 percent, they account for 65 percent of the sales in the economy. The share of goods exporters in sales is 55 percent while the share of services exporters is only 2 percent. The striking figure in Table 2 is the share of the firms that export both goods and services: Only 1.7 of the firms export both goods and services; however, they account for 8.6 percent of the sales in Turkish economy.

In the manufacturing sector, where most of the goods trade takes place, 40 percent of the firms engage in exporting. Moreover, the share of these exporters in sales is a stunning 83 percent. Similar figures exist for the services sector. While 14 percent of the firms in services sector engage in exports, more than half of the sales belong to these firms. The flashy figure in the services sector is the sales performance of the firms that export both goods and services: Although they constitute only 1.4 percent of the firms, they account more than 10 percent of the sales.

Sectoral decomposition of the manufacturing sector in terms of goods exporting intensity is homogeneous. Among the high-tech goods producers, more than half of the firms are exporters. Moreover, the exporting firms in these sectors account for more than 90 percent of the sales. Another fact about the high-tech goods producers is that the share of the firms that export goods and services is the highest and their share in sales is around 10 percent.

Exporting is less common among services firms. The most open sectors are transport and computers & R&D with 25 percent of firms that engage in exports. The striking figure in the transport sector is that the share of the firms that export both goods and services is 5 percent while their share in sales is almost 50 percent.

Table 3 shows that the size of the firms matters for exporting, as well. The larger the firm is, the more open it is to trade. While only 10 percent of the small firms with less than 20 employees engage in exports, this share increases to 72 percent for large firms with more than 500 employees. On the other hand, the share of services exporters does not rise with the size of the firm substantially.

There is a significant difference between manufacturing firms and services firms. Although the share of the small firms with 1 to 19 employees that export is around 10 percent in the economy, the share of exporting firms in manufacturing firms increase to 85 percent when size increases. However, the share is limited to less than 50 percent in the services sector even for firms with more than 500 employees.

<Insert Table 3 here>

The facts from Table 2 and Table 3 are that the share of firms that engage in services exports and their corresponding share in sales are limited. However, this is not the case for goods exporters and both goods and services exporters. The shares of firms in these trading status increase with firm size and constitute an important part of the economic activity. Therefore, next we analyze the goods exporter sample in Table 4 which presents the share of goods and services exporters by product (in goods) variety. The implications of this Table are striking. When the exported product variety increases the share of the firms that export both goods and services increases. This is more obvious in the manufacturing sector. This descriptive analysis suggests that when the variety of exported products increases the firms tend to export services as well. This may be interpreted as suggestive evidence for the complementarity of goods and services exports, confirming the correlations in Figure 1.

<Insert Table 4 here>

Finally, we explore the role of foreign involvement in the exporting decision of the firms. Figure 2 demonstrates the trading status of multinational enterprises (MNE) in Turkey. Compared to domestic firms, the share of exporting firms are much higher within MNEs. Nearly 30 percent of the foreign affiliated firms sell only to the domestic market. Among MNEs, 54 percent of the firms engage in goods exporting and 8 percent in services exporting. Moreover, 9 percent of multinationals export both goods and services.

<Insert Figure 2 here>

## 5 Comparison of goods and services exporters

In our analysis of firms that export both goods and services, we also investigate the differences between goods exporters ( $G\_E$ ), services exporters ( $S\_E$ ) and both goods and services exporters ( $E_{both}$ ) in terms of their size distributions. Figure 3 shows the kernel density diagrams of sales (in logs) in year 2008. The blue line

represents sales of *G\_E* firms; the green line, *S\_E* firms; and finally the red line, *Eboth* firms.

A domestic firm becomes an exporter, only after passing a certain size threshold. After that, as represented by the unaccompanied green line in the left part of Figure 3, small firms get into international trade first by exporting services. Then, as their size gets larger they add goods exporting into their lines of business as well. Among small to medium size firms, illustrated in the left half of the density diagram, more firms have *S\_E* status than *G\_E* and *Eboth*. However, as the firm gets larger, more firms export goods and services simultaneously. Moreover, very large firms never export services only demonstrated by the disappearance of green line after a certain value of sales. The implication of Figure 3 is similar to what we observed in the previous section: Firms that export both goods and services are larger in size than firms that only export goods.

<Insert Figure 3 here>

Next, we use more formal analysis to compare firms that export both goods and services with goods exporters and services exporters to confirm our previous observations. We regress firm characteristics on dummies representing trading status, namely, goods exporter (*G\_E*), services exporter (*S\_E*) and goods and services exporters (*Eboth*), where *non-traders* is the excluded category. The results of the regressions of descriptive firm characteristics on exporter groups are presented in Table 5. We run panel regressions with both year and 2-digit sector fixed effects<sup>7</sup>.

<Insert Table 5 here>

The results in Table 5 suggest that firms that engage in goods and services exports, *Eboth* are larger than non-exporters as well as goods exporters *G\_E* or services exporters *S\_E* in terms of all firm characteristics that we considered. This result confirms our previous findings. Moreover, it is suggestive that services trade complements goods trade. In other words, as goods exporters get larger they engage in exporting services as well.

Next, we compare goods exporters and services exporters. The results suggest that there are higher export premia for firms that exports goods only, *G\_E* in terms of sales, employment, wages and productivity. However, services exporters are more capital intensive. As our data set do not have any information on the quality of human capital, we use wages as a proxy, assuming that employees earning higher wages have higher quality. Based on this assumption, goods exporters employ higher quality workers compared to services exporters.

In order to analyze the reasons behind the fact that firms that export both goods and services are larger in size than firms that only export goods or services, we conduct two simple exercises here: (i) investigating the differences between domestic and foreign owned firms in their trading behavior as presented in Section 5.1 and (ii) analyzing the sectoral differences taking Turkey's comparative advantage into consideration as discussed in Section 5.2.

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<sup>7</sup> The results of the Hausman specification tests favor fixed effects estimates over random effects as presented in the bottom of the Table.

## 5.1 Ownership status

The results presented in Table 6 replicates the analyses in Table 5 for domestically and foreign owned firms that trade goods and services in Turkey in year 2008 only, due to data constraints.

<Insert Table 6 here>

Domestic firms that trade both goods and services are larger in terms of sales and employment, more capital intensive and productive and pay higher wages compared to firms that trade only goods or only services as in Table 5.

The case of multinational firms reported in the second panel of Table 6 is different from the domestic firms. An overwhelming majority of multinational firms that trade goods or services have developed country origins and therefore employ production or management techniques that reflect the developed country practices. For this reason, it is valuable to see if there is a difference in the trading behavior of the foreign-owned and domestically owned firms in Turkey.

Table 6 shows that MNEs that export only goods (*G\_E*) are larger than MNEs that export both goods and services (*Eboth*) in terms of their sales and are more capital intensive and productive. This result is in line with the results reported by Breinlich and Criscuolo (2011), yet contradicts the domestically owned firm results supplied in the first panel of Table 6. In other words, there exist larger trade premia from exporting only goods rather than engaging in both types of exports for multinational firms.

## 5.2 Sectoral Differences

So far, we have two important observations. First, in Turkey firms that export both goods and services are larger than firms that only export goods or services. Second, multinational firms operating in Turkey are different than domestic firms: Goods exporters are larger in size compared to both goods and services exporters. Next, we analyze if there are sectoral differences.

Table 7 repeats the regressions in Table 5 for each individual sector in 2-digit NACE Rev.1 classification. Each column of Table 7 is the regression result of each sector. For simplicity we only provide sales as the dependent variable. However, we also perform the same comparison among sectors for other firm characteristics and the results are similar.

<Insert Table 7 here>

The results shown in Table 7 suggest that almost in all of the sectors firms that export both goods and services have larger sales compared to firms that only export goods or services. We also run the same regressions for only domestic firms. The results are similar.<sup>8</sup>

Results in Table 7 do not reveal a pattern for the differences between sectors in terms of services exports. This may be due to the aggregation level in NACE Rev.1 2-digit sector classification. Therefore, we run regressions in 4-digit classification.

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<sup>8</sup> The results are available upon request.

In the 4-digit detail, it may be possible to observe a change in our main result where goods and services exporters show up as larger and more productive firms than goods exporters or services exporters. Since there are close to 500 4-digit sectors, the obvious next step would be to categorize our sectors as sectors with a comparative advantage or disadvantage in goods exports.<sup>9</sup>

Table 8 shows the regression results for firms that are in sectors with and without comparative advantage. The results suggest that firms that export both goods and services are larger in size compared to firms that export either goods or services regardless of having comparative advantage. Therefore, we conclude that, at the 4-digit detail, having comparative advantage in goods does not explain goods and service exporters being larger than other types of exporters in Turkey.

<Insert Table 8 here>

## 6 Determinants

In this section, we investigate the determinants of the decision to become a services exporter. Since we have information only on the extensive margin of services trade for the firms in our sample, it is not possible to include any country characteristics in our regressions. Under the circumstances, we end up analyzing the firm's discrete choice of whether or not to export services and then condition this decision on the firm characteristics only. We used the following equation to formalize the extensive margin estimation of services exporting observed within goods exporters:

$$Pr(\text{Services Exporter}) = \beta_0 + \beta_1(\text{Size})_{it} + \beta_2(\text{Goods Exports})_{it} + \beta_3 X_{it} + u_{it}$$

The dependent variable takes the value of 1 if the goods exporter decides to be a services exporter as well. As explained in Table 2, 1.7 percent of all firms export both goods and services. In line with the literature, exporting both goods and services is a rare activity in our sample as well.

Services export decision of firm  $i$  at time  $t$  is explained by *Size*, *Goods Exports* and other characteristics,  $X$  of the firm. We use a panel probit estimation with a robust variance-covariance matrix.

*Size* is proxied by two dummy variables *Large* and *Medium*.<sup>10</sup> *Goods Exports* in the above equation is measured by *Export Values* in regressions reported in Table 9 and *#Products* and *#Destinations* in regressions of Table 10. Other firm characteristics are *Productivity* and *Capital Intensity* as well as *#Plant* and *MNE*.

<Insert Table 9 here>

<Insert Table 10 here>

In both Table 9 and Table 10 after controlling for *Size* and *Goods Exports*, other firm characteristics are successively added to the regressions. In all regressions

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<sup>9</sup> NACE Rev.1 4-digit comparative advantage calculations are based on Leromain and Orefice (2013) who propose the use of an improved Balassa revealed comparative advantage index. We assumed that if the index for the sector is greater than 1, the sector has a comparative advantage.

<sup>10</sup> A continuous variable, *Employment*, is used to control for size as well. The results are qualitatively the same and available upon request.

reported in both Tables, goods exporters with a larger size, higher labor productivity and capital intensity are more likely to export services as well. While the number of local plants owned by the firm has no effect on the decision to become a services exporter, the involvement of a multinational firm (partially or fully) positively and significantly affects this decision.

*Export Value* affects the odds in favor of exporting services as shown in Table 9. However, this variable is significant only at 10 percent. In other words, a firm's volume of goods exports has a weak positive effect on the probability of that firm becoming a service exporter.

Upon finding this result we proceed to check the effect of product and destination variety of goods exports on the services export decision. Table 10 replicates the regressions in Table 9 by using *#Products* or *#Destinations* as a proxy for *Goods Exports*. The product variety and the destination variety results are reported in columns 1-4 and columns 5-8.

The results show that product variety is an important determinant for a firm to become a services exporter. This result can be tied to the interlaced nature of goods and services. For example, if a firm is producing and exporting many goods, it may be more cost efficient for this firm to provide transportation and insurance services to the final customer abroad. In other words, as firms diversify their portfolios of exported goods their probability of bundling these products with complementary services may increase.

The second set of results related to destination variety reported in Table 10 show no regular patterns. As the firms' diversity in terms of destinations of goods exported increases, the probability of becoming a services exporter goes up as reported in column (6). However, as we add other firm level controls in the regressions this effect disappears.

## 7 Conclusion

In the recent decades the world has witnessed rising services economies, which offer vast opportunities in a wide array of areas. Services provide essential inputs to other products and services. Services have important social function in areas such as health, education, energy, transport and telecommunications and indispensable in the expansion of global value chains.

The objective of understanding services trade, in particular the services exporters from the manufacturing lines of business, is the main propellant of the current paper, which offers a firm-level analysis of services exports in Turkey in 2003-2008.

Our results indicate that services exporting is a rare activity. Not only services firms but also manufacturing firms export services. Moreover, exporters of both goods and services are consistently bigger than goods exporters or services exporters. However, goods exporting multinational firms in Turkey are larger than multinationals that export both goods and services.

In our analysis of determinants of the decision to become a services exporter, we find that goods exporters with a larger size, higher labor productivity and

capital intensity are more likely to export services as well. Moreover, having a wide spectrum of goods to export increases the odds in favor of becoming a services exporter.

In this paper, we have concentrated on the services exports of goods exporters. However, the sectoral decomposition of goods and services exports can be important in shaping the international trade policy of a country. Liberalization can be justified when this action causes welfare improvements, which surface as gains from exchange and gains from specialization. Therefore, whether liberalization causes specialization in high-wage/high-productivity services or low-wage/low-productivity services matter for the long term growth of a country and warrants further investigation. In Turkey, for example, among the exporters of both goods and services 46 percent of the firms come from the services sector while 54 percent from the manufacturing. Again, among these firms, the labor intensive manufacturing, the high-tech capital intensive manufacturing, wholesale/retail and transportation firms constitute 18 percent, 16 percent, 17 percent and 16 percent of goods and services exporters, respectively. Therefore, in which sector the service trade liberalization will happen, matters. The impact of liberalization of services on overall economy would be captured by using the input-output tables.

Another important area of future research is the industry restructuring after services trade liberalization. The response of firms producing and exporting goods and services as a bundle for a better competitive position in international markets and the response of firms with unrelated lines of goods and services business to services liberalization can have different repercussions for sectoral and country level productivity and growth patterns.



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**Table 1. Global trends in services exports, 2011**

	<i>Share in GDP</i>		<i>Share in Services Exports</i>						
	Services Exports	Goods Exports	Trans.	Trav.	Comm.	Constr.	Fin & Ins.	Comp.	Other Business
Estonia	23.8	74.3	40.2	23.2	4.4	6.2	1.7	4.5	19.9
Iceland	20.9	38.1	46.5	25.5	1.5	0.3	1.3	1.9	23.2
Denmark	19.7	33.5	61.0	10.0	1.0	0.5	1.5	2.8	23.1
Belgium	18.2	92.8	28.1	12.5	4.8	3.0	5.4	5.2	39.8
Netherlands	16.3	80.2	22.0	10.6	4.4	2.0	1.7	4.6	54.7
Hungary	15.6	81.7	20.9	25.9	1.7	2.0	1.0	6.0	42.3
Austria	14.6	42.7	24.0	32.8	2.3	1.3	3.7	4.3	31.7
Sweden	13.8	34.9	15.2	18.6	2.9	1.2	3.3	11.8	47.0
Greece	13.7	11.7	49.4	36.8	1.3	3.2	1.9	1.2	6.1
Slovenia	13.4	69.2	27.0	40.4	5.5	3.3	2.3	2.3	19.3
Thailand	11.9	64.4	14.1	65.9	1.2	1.1	1.0	0.1	16.6
UK	11.7	20.3	12.8	12.1	3.6	0.9	28.1	5.1	37.5
Finland	11.4	30.2	11.8	12.7	1.2	6.5	2.7	22.3	42.8
Portugal	11.1	25.1	27.4	43.0	2.5	3.0	1.8	2.0	20.4
Czech Rep.	10.7	75.4	23.7	33.1	2.2	3.7	1.7	7.8	27.8
Israel	10.4	26.3	16.5	18.2	1.1	3.7	0.1	35.5	24.9
Spain	9.7	21.1	16.9	42.4	1.6	3.0	4.7	4.7	26.6
Norway	8.6	32.6	41.1	12.3	3.0	1.2	6.0	3.2	33.1
Korea	8.4	49.8	39.3	13.3	0.9	16.5	4.2	0.5	25.2
Egypt	8.1	13.4	43.1	45.8	3.8	2.1	1.4	0.9	3.0
France	8.0	21.5	20.3	24.4	2.9	4.3	5.3	1.9	41.0
India	7.3	16.2	12.7	12.8	1.2	0.6	6.4	31.8	29.3
Poland	7.3	36.6	29.1	28.3	1.6	4.3	2.4	5.7	28.6
Germany	7.2	40.7	23.0	14.9	2.2	4.7	8.1	7.2	39.9
<b>World</b>	<b>6.0</b>	<b>25.8</b>	<b>20.6</b>	<b>25.1</b>	<b>2.5</b>	<b>2.6</b>	<b>9.7</b>	<b>5.8</b>	<b>33.4</b>
Romania	5.3	33.2	30.9	14.1	7.2	4.6	3.3	10.3	29.7
Chile	5.2	32.4	58.8	14.5	1.2	0.0	5.3	1.8	18.4
<b>Turkey</b>	<b>5.0</b>	<b>17.4</b>	<b>27.8</b>	<b>59.8</b>	<b>1.4</b>	<b>3.2</b>	<b>3.6</b>	<b>0.0</b>	<b>4.1</b>
Italy	4.8	23.8	14.5	40.8	6.4	0.1	4.9	2.3	31.0
Canada	4.4	25.4	17.0	21.5	4.0	0.5	7.3	8.9	40.7
US	3.8	9.5	13.5	25.4	2.2	0.5	15.2	2.6	40.6
Australia	3.7	19.5	10.6	61.8	2.3	0.1	3.5	3.1	18.4
South Africa	3.6	24.4	12.0	66.0	1.4	0.5	8.5	2.2	9.5
Argentina	3.5	18.8	14.3	34.8	1.8	0.3	0.2	11.6	37.0
Russia	2.9	27.5	31.6	20.8	2.7	8.1	2.6	3.2	31.0
Japan	2.4	14.0	26.9	7.7	0.5	7.7	4.0	0.8	52.3
China	2.4	25.9	20.2	27.6	1.0	8.4	2.2	6.9	33.7
Brazil	1.5	10.3	16.0	18.0	0.9	0.1	8.7	0.6	55.8
Mexico	1.3	30.1	5.6	77.6	1.5	0.0	14.8	0.0	0.5

Source: World Trade Organization and World Bank

**Table 2. The share of goods and services exporters by sector**

	<i>Share of Firms</i>				<i>Share of Sales</i>			
	Notrade	G_E	S_E	Eboth	Notrade	G_E	S_E	Eboth
<i>Manufacturing</i>	<i>60.0</i>	<i>37.6</i>	<i>0.3</i>	<i>2.1</i>	<i>17.2</i>	<i>76.2</i>	<i>0.3</i>	<i>6.4</i>
Resource intensive	69.4	29.0	0.2	1.5	22.5	74.5	0.2	2.8
Labor intensive	60.0	37.9	0.3	1.8	26.3	69.3	0.3	4.2
Capital intensive, low-med tech	59.7	38.1	0.3	1.9	16.9	77.7	0.3	5.1
Capital intensive, high tech	50.2	46.0	0.5	3.3	6.9	81.2	0.3	11.6
Technology intensive, high tech	44.1	50.0	0.7	5.2	9.7	79.9	0.1	10.2
<i>Services</i>	<i>86.4</i>	<i>9.4</i>	<i>2.8</i>	<i>1.4</i>	<i>46.5</i>	<i>40.2</i>	<i>3.2</i>	<i>10.2</i>
Const.& util.	91.6	6.3	0.7	1.4	63.3	32.9	0.4	3.4
Wholesale & retail	80.6	17.6	0.5	1.3	43.5	52.4	0.5	3.7
Hotels & Rest.	96.7	1.9	1.2	0.3	81.0	12.5	4.9	1.6
Transport	72.2	5.4	17.2	5.2	19.9	15.0	15.2	49.9
Comp. & R&D	76.5	6.7	11.3	5.5	49.2	17.7	13.6	19.5
Other services	95.1	1.6	2.8	0.5	80.1	9.4	8.0	2.5
<b>TOTAL</b>	<i>74.7</i>	<i>21.8</i>	<i>1.7</i>	<i>1.7</i>	<i>34.5</i>	<i>55.0</i>	<i>2.0</i>	<i>8.6</i>

Note: Table reports the share of firms and share of sales in 11 aggregate sectors in terms of the trading status. “*Eboth*” refers to firms that export both goods and services, “*G\_E*” refers to firms that export goods but do not export services, “*S\_E*” refers to the firms that export services but not goods. “Notrade” refers to firms that export neither goods nor services.

**Table 3. The share of goods and services exporters by size**

	<i>Total</i>				<i>Manufacturing</i>				<i>Services</i>			
	Notrade	S_E	G_E	Eboth	Notrade	S_E	G_E	Eboth	Notrade	S_E	G_E	Eboth
<i>#employee</i>												
1-19	90.30	0.69	8.61	0.40	87.23	0.18	12.20	0.39	92.63	1.08	5.88	0.41
20-50	68.50	2.07	27.51	1.92	57.95	0.32	39.81	1.92	79.92	3.96	14.19	1.93
51-100	59.16	2.15	35.60	3.09	44.05	0.50	52.35	3.10	77.60	4.16	15.15	3.09
101-250	47.57	1.86	46.06	4.51	31.16	0.49	63.50	4.85	75.13	4.18	16.75	3.93
251-500	37.27	2.26	54.20	6.27	20.78	0.49	72.57	6.16	64.30	5.17	24.08	6.46
500+	27.80	1.70	62.52	7.98	13.63	0.30	79.22	6.85	52.93	4.19	32.89	9.99
<b>TOTAL</b>	<b>71.45</b>	<b>1.60</b>	<b>24.97</b>	<b>1.98</b>	<b>59.65</b>	<b>0.32</b>	<b>37.86</b>	<b>2.17</b>	<b>83.61</b>	<b>2.92</b>	<b>11.69</b>	<b>1.78</b>

Note: Table reports the share of firms in different size categories in terms of trading status. “*Eboth*” refers to firms that export both goods and services, “*G\_E*” refers to firms that export goods but do not export services, “*S\_E*” refers to the firms that export services but not goods. “Notrade” refers to firms that export neither goods nor services. The first column shows the size groups of the firms measured in terms of number of employees. Panel 1 reports the shares for the full sample, whereas Panel 2 and Panel 3 report the shares for manufacturing and services sector sample, respectively. As there are firms where employment numbers are missing, the total figures do not represent the overall sample as in Table 2.

**Table 4. The share of goods and services exporters by product variety**

	<i>Total</i>		<i>Manufacturing</i>		<i>Services</i>	
	G_E	Eboth	G_E	Eboth	G_E	Eboth
<i>#products</i>						
1	93.27	6.73	96.77	3.23	85.52	14.48
2-5	93.70	6.30	95.84	4.16	86.70	13.30
6-10	93.13	6.87	94.96	5.04	86.64	13.36
11-20	92.54	7.46	93.83	6.17	88.03	11.97
21-30	92.22	7.78	93.51	6.49	87.63	12.37
31-50	91.53	8.47	93.12	6.88	87.05	12.95
51-100	91.31	8.69	92.69	7.31	88.15	11.85
100+	87.78	12.22	90.12	9.88	84.40	15.60
<b>TOTAL</b>	93.27	6.73	96.77	3.23	85.52	14.48

Note: Table reports the share of firms in different product variety groups in terms of trading status. “*Eboth*” refers to firms that export both goods and services, “*G\_E*” refers to firms that export goods but do not export services, “*S\_E*” refers to the firms that export services but not goods. “Notrade” refers to firms that export neither goods nor services. The first column shows the range of product variety exported by these firms. Panel 1 reports the shares for the full sample, whereas Panel 2 and Panel 3 report the shares for manufacturing and services sector sample, respectively.

**Table 5. Regressions of firm-level variables on trading status**

	Sales	Employment	Capital Intensity	Wages	Productivity
<i>Eboth</i>	0.347*** (0.014)	0.203*** (0.010)	0.638*** (0.075)	0.337*** (0.014)	0.129*** (0.012)
<i>G_E</i>	0.254*** (0.008)	0.150*** (0.005)	0.221*** (0.041)	0.222*** (0.010)	0.093*** (0.006)
<i>S_E</i>	0.134*** (0.016)	0.097*** (0.011)	0.537*** (0.088)	0.131*** (0.020)	0.041*** (0.013)
R <sup>2</sup>	0.010	0.019	0.001	0.015	0.009
Hausman	6,362***	3,530***	3,380***	2,040***	3,826***
# of Obs	330,858	319,702	319,702	330,855	319,702

Note: Standard errors are reported in brackets. \*\*\*, \*\* and \* denotes significance at 1%, 5% and 10%, respectively. The methodology is Panel fixed effects regressions with year and industry fixed effects. The explanatory variables are “*Eboth*”, which refers to firms that export both goods and services; “*G\_E*”, which refers to firms that export goods but do not export services; “*S\_E*”, which refers to the firms that export services but not goods. Firms that export neither goods nor services are represented in the constant term. The dependent variables are given at the top of each column. All dependent variables are in real terms except for employment and in logarithmic form. Under the null hypothesis of the Hausman specification test, the random effects model provides consistent estimates as opposed to the fixed effects model.

**Table 6. Regressions of firm-level variables on exporting status  
by ownership structure, 2008**

<u>Domestic</u>	Sales	Employment	Capital Intensity	Wages	Productivity
<i>Eboth</i>	2.200*** (0.045)	1.096*** (0.032)	3.599*** (0.101)	2.339*** (0.047)	1.001*** (0.029)
<i>G_E</i>	1.847*** (0.018)	0.862*** (0.012)	2.603*** (0.046)	1.807*** (0.022)	0.890*** (0.012)
<i>S_E</i>	1.367*** (0.045)	0.567*** (0.031)	3.093*** (0.124)	1.573*** (0.055)	0.713*** (0.032)
R <sup>2</sup>	0.131	0.083	0.058	0.068	0.066
# of Obs	55,070	55,070	55,070	55,070	55,070
<u>MNE</u>	Sales	Employment	Capital Intensity	Wages	Productivity
<i>Eboth</i>	1.561*** (0.180)	0.785*** (0.132)	1.447*** (0.287)	1.733*** (0.198)	0.726*** (0.120)
<i>G_E</i>	1.617*** (0.112)	0.746*** (0.082)	1.514*** (0.211)	1.412*** (0.154)	0.822*** (0.086)
<i>S_E</i>	0.382** (0.179)	0.189 (0.124)	0.851*** (0.287)	0.916*** (0.223)	0.157 (0.133)
R <sup>2</sup>	0.137	0.062	0.043	0.080	0.073
# of Obs	1,633	1,633	1,633	1,633	1,633

Note: Domestic firms include only privately owned firms. Standard errors are reported in brackets. \*\*\*, \*\* and \* denotes significance at 1%, 5% and 10%, respectively. “*Eboth*” refers to firms that export both goods and services, “*G\_E*” refers to firms that export goods but do not export services, “*S\_E*” refers to the firms that export services but not goods. Firms that export neither goods nor services are represented in the constant term. All dependent variables are in real terms except for employment and in logarithmic form.

**Table 7. Regressions of sales on exporting status by 2-digit NACE sector**

	15	16	17	18	19	20	21	22	23	24	25	26
<i>Eboth</i>	0.387*** (0.059)	-0.0804 (0.383)	0.265*** (0.039)	0.324*** (0.039)	0.374*** (0.092)	0.385*** (0.112)	0.448*** (0.093)	0.237*** (0.067)	0.330 (0.216)	0.374*** (0.076)	0.302*** (0.045)	0.257*** (0.062)
<i>G_E</i>	0.185*** (0.029)	-0.033 (0.284)	0.213*** (0.018)	0.243*** (0.019)	0.229*** (0.053)	0.259*** (0.055)	0.273*** (0.055)	0.167*** (0.049)	0.230 (0.211)	0.293*** (0.057)	0.230*** (0.031)	0.192*** (0.035)
<i>S_E</i>	-0.517 (0.432)	- 1.382*** (0.426)	0.092 (0.139)	0.146 (0.091)	0.101 (0.066)	-0.386 (0.528)	-0.182* (0.110)	0.047 (0.155)	0.318 (0.274)	-0.054 (0.161)	0.100 (0.202)	0.278*** (0.099)
R <sup>2</sup>	0.009	0.025	0.016	0.016	0.017	0.029	0.027	0.009	0.008	0.017	0.020	0.008
Hausman	212.11	-26.39	165.13	290.37	30.34	16.67	39.09	50.07	10.13	58.46	181.44	93.11
# of Obs	14,120	145	19,010	20,487	3,234	2,181	2,595	3,415	481	4,648	7,619	9,655

	27	28	29	31	32	33	34	35	36	37	40
<i>Eboth</i>	0.215** (0.090)	0.354*** (0.062)	0.319*** (0.044)	0.312*** (0.059)	0.120 (0.166)	0.272 (0.188)	0.500*** (0.077)	1.480*** (0.309)	0.324*** (0.059)	0.295 (0.552)	0.209 (0.295)
<i>G_E</i>	0.201*** (0.047)	0.216*** (0.035)	0.227*** (0.025)	0.226*** (0.048)	0.131 (0.148)	0.294*** (0.086)	0.256*** (0.046)	1.008*** (0.217)	0.229*** (0.033)	0.389 (0.260)	0.247** (0.122)
<i>S_E</i>	-0.165 (0.344)	0.435*** (0.124)	0.097 (0.087)	0.462** (0.197)	0 (0)	0.339* (0.198)	0.179 (0.188)	0.520*** (0.192)	0.144 (0.190)	0 (0)	0.049 (0.260)
R <sup>2</sup>	0.009	0.015	0.016	0.020	0.003	0.022	0.029	0.044	0.018	0.033	0.003
Hausman	175.34	143.21	291.45	12.08	7.68	37.98	48.87	11.97	126.99	1.02	30.26
# of Obs	4,823	12,346	11,900	3,601	652	1,145	4,447	3,229	8,042	155	1,263

Note: Standard errors are reported in brackets. \*\*\*, \*\* and \* denotes significance at 1%, 5% and 10%, respectively. All regressions include year and industry fixed effects. The explanatory variables are “*Eboth*”, which refers to firms that export both goods and services; “*G\_E*”, which refers to firms that export goods but do not export services; “*S\_E*”, which refers to the firms that export services but not goods. Firms that export neither goods nor services are represented in the constant term. The dependent variable is sales in real terms and in logarithmic form. The column titles represent the sectors in 2 digits NACE code. Under the null hypothesis of the Hausman specification test, the random effects model provides consistent estimates as opposed to the fixed effects model.



**Table 8. Regression of sales on exporting status, by comparative advantage**

VARIABLES	<i>Firms in sectors with comparative advantage</i>		<i>Firms in sectors without comparative advantage</i>	
	Full sample	MNE	Full sample	MNE
<i>Eboth</i>	0.336*** (0.025)	0.192 (0.126)	0.333*** (0.017)	0.347*** (0.119)
<i>G_E</i>	0.210*** (0.013)	0.251** (0.115)	0.253*** (0.009)	0.403*** (0.132)
<i>H_E</i>	0.279*** (0.067)	-0.092 (0.138)	0.128*** (0.016)	0.195** (0.0963)
R <sup>2</sup>	0.015	0.027	0.009	0.040
# of Obs	59,556	975	271,302	3,850

Note: Standard errors are reported in brackets. \*\*\*, \*\* and \* denotes significance at 1%, 5% and 10%, respectively. All regressions include year and industry fixed effects. The explanatory variables are “*Eboth*”, which refers to firms that export both goods and services; “*G\_E*”, which refers to firms that export goods but do not export services; “*S\_E*”, which refers to the firms that export services but not goods. Firms that export neither goods nor services are represented in the constant term. The dependent variable is sales in real terms and in logarithmic form. The first 2 columns are for the sectors with comparative advantage, whereas the last 2 columns are for the sectors without comparative advantage in goods exports. The first and third columns cover the full sample but the second and last columns are for MNEs. Under the null hypothesis of the Hausman specification test, the random effects model provides consistent estimates as opposed to the fixed effects model.

**Table 9. Determinants of services exports**

VARIABLES	(1)	(2)	(3)	(4)	(5)
<i>Size: Large</i>	0.140*** (0.021)	0.116*** (0.021)	0.198*** (0.022)	0.198*** (0.022)	0.186*** (0.022)
<i>Size: Medium</i>	0.129*** (0.021)	0.119*** (0.021)	0.119*** (0.021)	0.119*** (0.021)	0.113*** (0.021)
<i>Export Value</i>		0.018*** (0.004)	0.006* (0.004)	0.006* (0.004)	0.006* (0.004)
<i>Productivity</i>			0.044*** (0.008)	0.044*** (0.008)	0.038*** (0.008)
<i>Capital Intensity</i>			0.020*** (0.002)	0.020*** (0.002)	0.020*** (0.002)
<i>#Plants</i>				-0.000 (0.017)	0.002 (0.017)
<i>MNE</i>					0.231*** (0.037)
$\chi^2$	61.58	87.65	345.21	345.72	393.32
# of Obs	77,963	77,963	76,153	76,153	76,153

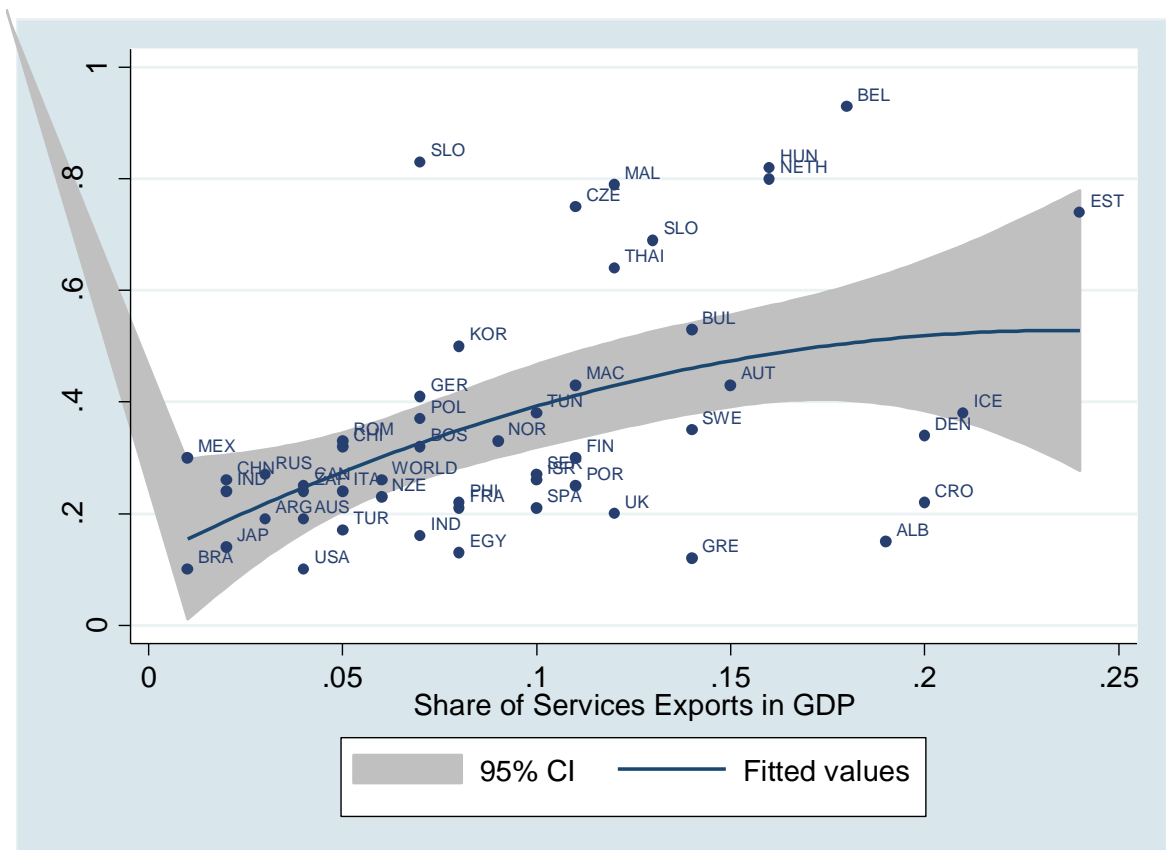
Note: Standard errors are reported in brackets. \*\*\*, \*\* and \* denotes significance at 1%, 5% and 10%, respectively. Panel probit regressions with year fixed effects are used.

**Table 10. Determinants of services exports, robustness**

VARIABLES	Product variety				Destination variety			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Size: Large</i>	0.102*** (0.021)	0.178*** (0.022)	0.179*** (0.022)	0.167*** (0.022)	0.124*** (0.021)	0.211*** (0.022)	0.211*** (0.022)	0.200*** (0.022)
<i>Size: Medium</i>	0.111*** (0.021)	0.110*** (0.021)	0.110*** (0.021)	0.105*** (0.021)	0.122*** (0.021)	0.124*** (0.021)	0.124*** (0.021)	0.119*** (0.021)
<i>#Products</i>	0.062*** (0.007)	0.041*** (0.007)	0.041*** (0.007)	0.039*** (0.007)				
<i>#Destinations</i>					0.037*** (0.010)	-0.005 (0.011)	-0.005 (0.012)	-0.008 (0.011)
<i>Productivity</i>		0.039*** (0.008)	0.039*** (0.008)	0.033*** (0.008)		0.049*** (0.008)	0.049*** (0.008)	0.043*** (0.008)
<i>Capital Intensity</i>		0.020*** (0.002)	0.020*** (0.002)	0.020*** (0.002)		0.020*** (0.002)	0.020*** (0.002)	0.020*** (0.002)
<i>#Plants</i>			-0.002 (0.017)	0.000 (0.017)			-0.002 (0.017)	0.001 (0.017)
<i>MNE</i>				0.226*** (0.037)				0.233*** (0.037)
$\chi^2$	138.46	370.35	371.02	415.94	76.80	338.38	339.04	386.84
# of Obs	77,963	76,153	76,153	76,153	77,963	76,153	76,153	76,153

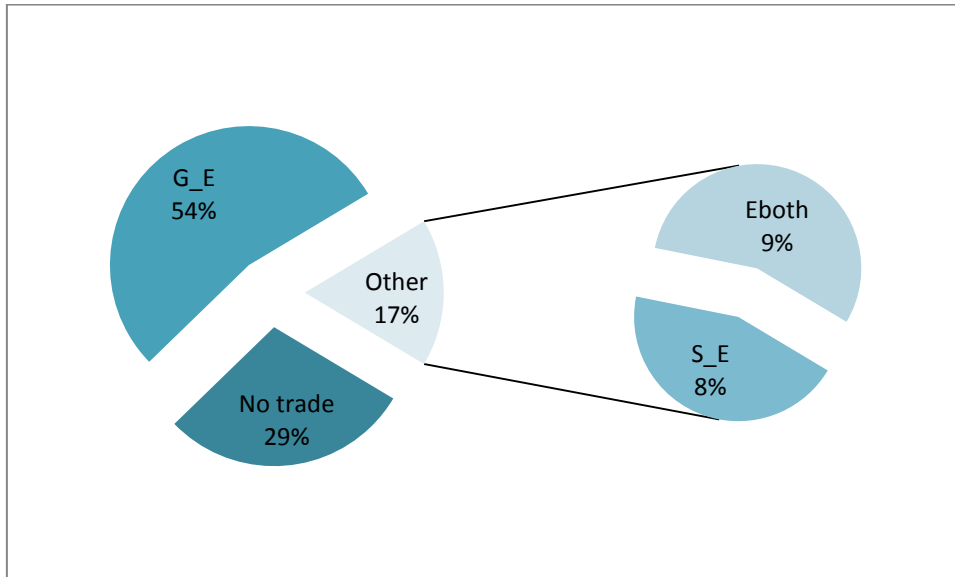
Note: Standard errors are reported in brackets. \*\*\*, \*\* and \* denotes significance at 1%, 5% and 10%, respectively. Panel probit regressions with year fixed effects are used.

**Figure 1. Relative size of goods and services exports, 2011**



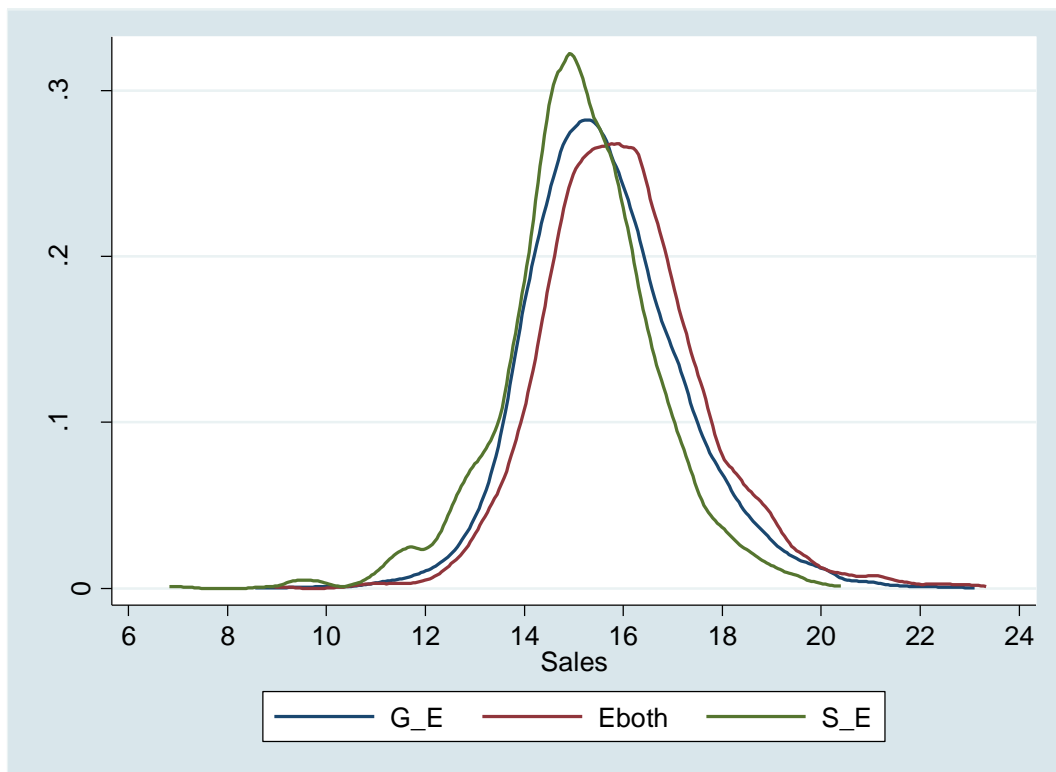
Source: Own calculations using Table 1.

**Figure 2. Services trade and foreign participation**



Note: All firms with any foreign involvement are reported. “*Eboth*” refers to the firms that export both goods and services, “*S\_E*” refers to firms that export only services, “*G\_E*” refers to firms that export only goods and “*Notrade*” refers to firms that export neither goods nor services.

**Figure3. Kernel density of size by exporter status, 2008**



Note: Sales are in real terms and in logarithmic form. “*Eboth*” refers to the firms that export both goods and services, “*S\_E*” refers to firms that export only services and “*G\_E*” refers to firms that export only goods.

**Table A1. Descriptive statistics**

VARIABLE	MEAN	STD. DEV.	MIN.	MAX.	Observations
<i>Eboth</i>	0.017	0.130	0	1	330859
<i>G_E</i>	0.218	0.413	0	1	330859
<i>S_E</i>	0.017	0.129	0	1	330859
<i>Employment</i>	3.316	1.306	0.693	11.04	319703
<i>Large</i>	0.160	0.367	0	1	330859
<i>Medium</i>	0.117	0.321	0	1	330859
<i>Sales</i>	14.01	2.337	0	23.32	330859
<i>Capital Intensity</i>	6.101	5.035	0	20.94	319703
<i>Wages</i>	11.21	3.402	0	21.30	330856
<i>Productivity</i>	10.80	1.529	0	19.68	319703
<i>MNE</i>	0.015	0.120	0	1	330859
<i>#Plant</i>	0.872	0.390	0.693	7.757	330859
<i>Export Value</i>	2.942	5.442	0	22.09	330859
<i>#Products</i>	0.543	1.151	0	8.722	330859
<i>#Destinations</i>	0.369	0.782	0	4.905	330589

**Table A2. Panel characteristics**

	Overall		Between		Within
	Frequency	Percent	Frequency	Percent	Percent
<i>Eboth</i>	5,731	1.7	3,383	2.8	34.2
<i>G_E</i>	72,232	21.8	24,126	19.8	69.1
<i>S_E</i>	5,625	1.7	2,879	2.4	45.1