

# French Firms in International Trade in Services<sup>\*†</sup>

Guillaume Gaulier<sup>‡</sup>    Emmanuel Milet<sup>§</sup>    Daniel Mirza<sup>¶</sup>

Published as:

Gaulier, G., E. Milet, D. Mirza, (2010), “Les Firmes Françaises dans le Commerce de Services”, *Économie et Statistiques*, n°435-436, pp 125-147.

## Abstract

This paper is the first to use the Banque de France database on firm-level exports and imports of services. We first show that firms trading services are bigger, more productive and pay higher wages than the purely domestic ones. Second, exports are very concentrated among a few numbers of firms. Finally, exporters from the service sector are two to five times smaller than exporters from the manufacturing sector. We conclude with an econometric estimation of the export decision, and show that previous export of both goods and services is an important determinant of present exports of services.

Keywords: Service Trade, Firm heterogeneity, Firm-Level Evidence, France.

JEL codes: D22, F14, L80.

---

\*This is a translation of the original article, published in French in the journal *Économie et Statistiques*.

†This paper greatly benefited from helpful comments from Matthieu Crozet and an anonymous referee. Authors wish to thank the Direction Générale des Statistiques de la Banque de France for providing us with the data. All remaining errors are ours. This paper represents the view of the authors and should not be interpreted as reflecting those of Banque de France.

‡Economist at the Banque de France (DGEI-DEMS-SEC2E), associate researcher at CEPII

§Université Paris I – Panthéon-Sorbonne

¶Université François Rabelais and GERCIE, CEPII/CIREM (Paris) and Banque de France.

# 1 Introduction

Little research has been done on international trade in services. Three reasons can explain this lack of study. First, it is difficult to come up with a theory of trade in services. Even with a classification into four distinct modes, services remain highly heterogeneous within each mode. The General Agreement on Trade in Services (GATS) classifies services as follows: cross-border trade (mode 1), consumption abroad (mode 2), commercial presence (mode 3) and temporary movement of natural persons (mode 4). Just like we cannot have a unique theoretical framework explaining at the same time the setting-up of affiliates abroad (mode 3) and tourism (mode 2), it is not straightforward to have a framework explaining both trade in telecommunication services and trade in architect services, two services belonging to the same mode. The second reason is the lack of available data. Considerable efforts have nevertheless been undertaken in the last years by international organizations (WTO, OECD) to collect detailed data of good quality, and some studies have already been carried with these data (Bensidoun and Ünal Kesenci 2008, Lennon 2009, Head et al. 2009) The last reason is more related to the recent trend in international economic research. As more and more firm-level data have become available, a new literature emerged based on firm heterogeneity. Many studies have been carried on this topic, both empirically (Roberts and Tybout 1997, Bernard and Jensen 1999) and theoretically (Jean 2002, Melitz 2003). One could say that this new area of research has increased the opportunity cost of studying trade in services.

Whatever the reason, the misunderstanding of trade in services is unfortunate given the role they play in domestic economies and globalization, and their importance in political economy. Developed economies often describe this sector as a "shelter", given the strong competition the manufacturing sector faces both at the national and international level. Some international agreements include clauses on services, but market access conditions for some services are not necessarily specific to services only. For example, as we will see in more details in this study, trade in Research and Development by French firms accounts for a quarter of total trade in services, both in the manufacturing and in the service sector. More, the manufacturing firms exporting services are almost always exporting goods at the same time. Therefore, market access for exports of services seem to be strongly linked to industrial policies which focus on manufacturing goods, not services.

It is important to identify the costs exporters have to pay to get access to foreign markets. In particular, does the cost differ if the firm belongs to the manufacturing or service sector? Does trade in goods has any interesting feature to teach us? Answering these questions will allow us to better assess the full potential of trade in services, and help define efficient trade policies.

This paper builds on the recent international trade literature based on heterogeneous firms. We exploit a unique database on firm-level exports and imports of services (mode 1). The new literature looks empirically and theoretically at firm heterogeneity as the main determinant for international trade in goods and services (Melitz 2003, Bernard et al. 2007). To our best knowledge, a very limited number of studies has used firm-level data on trade in services.<sup>1</sup> Irac (2008) looks at the distribution of productivity of French firms

---

<sup>1</sup>in an unpublished paper, Sicsic (2006) partially describes the French data on international trade in ser-

around the time they enter the export market. She intends to test the existence of learning-by-doing or selection effect mechanisms. She uses both data on trade in goods and trade in services, but does not propose any detailed analysis of the latter. Our work is closely related to the work by Breinlich and Criscuolo (2011) who look at international trade in services by British firms. Our first objective is to produce a series of stylized facts and compare them with the one found by these authors. This study, however, goes beyond Breinlich and Criscuolo (2011) in one aspect: we explicitly show the differences between firms from the manufacturing sector and firms from the service sector. We highlight interesting stylized facts that we confirm in our econometric analysis. The rest of the paper is organized as follows: in section 2 we present the different database. Section 3 presents some stylized facts on firms trading services. Specifically, we compare firm characteristics (such as productivity, turnover, employment) for firms trading goods or services, and for firms from the manufacturing or service sector. In section 4, we estimate an export decision equation. Section 5 concludes.

## 2 Data

Firm-level data on trade in services are collected by the Statistic Division of the Banque de France (Direction Générale des Statistiques – Direction de la Balance des Paiements/Direction des Enquêtes Statistiques Sectorielles). For each firm, exports and imports per service, partner country and year are reported. Data are either directly collected among firms (for the largest firms, the so-called “Déclarants Direct Généraux” – DDG), or more generally through banking declarations, and then aggregated at the national level to be included in the Balance of Payments. In the GATS terminology, we are dealing here with mode 1 services (cross-border trade) and a small share of mode 4 (temporary movement of natural persons). Until 2003, DDG firms were firms exporting more than 1 billion FF (150 million€) in goods and services, or with total monthly transactions exceeding 100,000 FF. In 2003, this definition became more restrictive. Following a decree on the Central Bank activity, DDG are now firms whose foreign transactions must exceed 30 million€ for at least one type of service (in the balance of payment classification). The DDG firms (around 500) account for around 70% of total trade in services in our database. In the case of banking declarations, transactions are on average smaller since they account for all flows involving a banking transaction (intra-firm trade is excluded). The declaration threshold is 12,500€, and has been increased to 50,000€ in 2008.

In the rest of the paper, we will refer to this database as the Trade in Services database from the Banque de France (TSBF). Each firm is identified by a unique identifier (SIREN code). We also have information on the nature of the service (see Appendix 1 for a full description of the 21 services). To use the framework on heterogeneous firms, we keep services whose “market functioning” is similar to the one for manufactured goods. We therefore exclude services such as tourism, hotel, accommodation, transport and insur-

---

vices. He looks at the possible consequences of alternative ways of collecting data. Fontagné and Gaulier (2009), using the same data look mainly at the contribution of entry and exit of firms to export growth. They show that there is no significant contribution, gross entry and exit flows of exporters are very large, balancing on average each year.

ance (except for insurance premia, where we follow the Direction Générale des Statistiques of the Banque de France which estimates that premia account for 25% of total assurance transactions), and wholesaling.

Data on trade in goods are collected by the custom office (Direction Générale des Douanes et Droits Indirects). We call this database CUSTOM. For each firm, this database reports the exports and imports of goods at the 6-digit level, per partner country. Three other dataset are used in this study. First is the STOJAN (for Stock January) database provided by INSEE. It lists all existing firms on the 1<sup>st</sup> of January. From this database, we extract the main activity of the firm, so that it can be classified as manufacturing or service firm. We can then calculate the share of firms involved in trade in goods or services in each sector. We then merge these database with data on the balance sheet of the firm, coming from the Enquêtes Annuelles d’Entreprise (EAE) (a Business Survey), available for the agricultural, manufacturing and service sectors. The EAE for the service sector collects exhaustive information on firms with more than 30 employees or with a turnover larger than 5 million€. Smaller firms are interrogated on a semi-annual basis. However, the EAE in the manufacturing or agricultural sector concerns firms with more than 20 employees. To get a comprehensible database, we only keep firms with more than 30 employees (our results remain similar if we use the full sample). Data on trade in goods and services run from 1999 to 2007, but we restrict data to 2004, due to data availability of the EAE. Finally, we use information on the ownership of the firm, by using the LiFi (for Financial Liaisons) database. Each French firm is either independent, registered as the headquarter, a joint-venture, an affiliate with majority control, an affiliate with minority control, or belongs to the enlarged “web” of a firm. We pool the last three kinds of firms into a unique category. Firms not referenced in the LiFi database are assumed to be independent. INSEE mentions that firms interrogated in LiFi are private firms whose participation portfolio is larger than 1,2million€ or with a turnover larger than 60 million€ or with more than 500 employees. Small firms that are not directly linked to the headquarter will appear as independent. We also can discriminate between foreign-owned firms and French-owned firms.

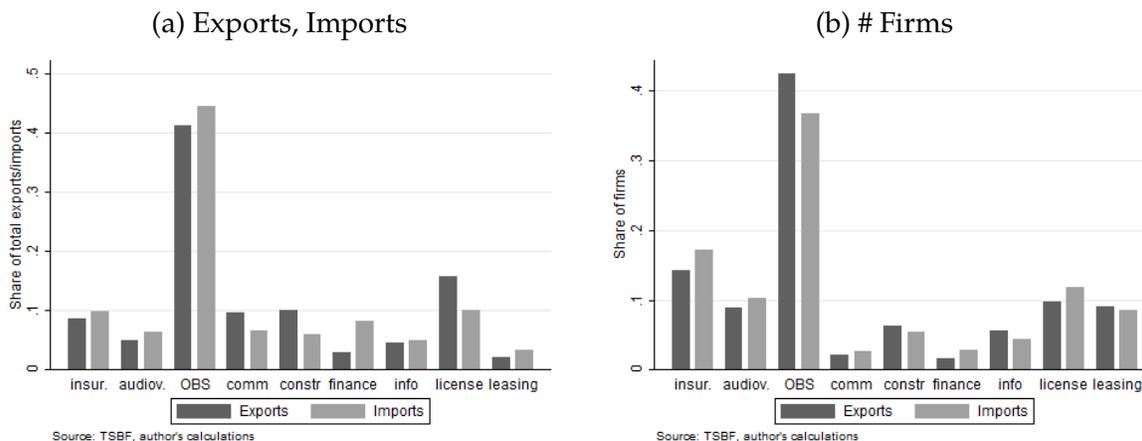
### 3 Trade in Services by French Firms

Table 1: Trade in Services between 1999 and 2007

Year	Exports (K€)	Imports (K€)	Nb. Exporters	Nb. Importers
1999	23,230,197	21,404,944	10,489	8,179
2007	35,392,940	36,376,815	13,507	14,369
Growth rate (%)	52	70	29	76

Between 1999 and 2007, French exports of services grew by 52%, from 23bn€ to 35bn€, while the number of exporters grew by 29% with about 13,500 exporters in 2007 (Table 1). On the import side, growth rates are much larger, with an increase of 70% for the number of importers, and 76% growth in imports over the period. A striking feature of the data is that very few firms export services. When divided by the total number of existing firms,

Figure 1: Distribution of exports and imports and firm population across services



we are left with only 0.4% firms having an export activity in services in 2004. Exporters of services are ten times less numerous than exporters of manufacturing goods. It is important to look at the nature of the service traded (cf. panels (a) and (b) of figure 1). The 21 services available in the balance of payments are aggregated into 9 categories: insurance, audiovisual, telecommunication, construction, finance, information & informatics, license and patents, leasing, and other business services. The other business services consist of architecture, judicial services, research and development, and overheads services. This category is by far the most important both for exports and imports. Around 35% of firms are trading in “other business services”, which account for more than 40% of total exports and imports. The next largest item is license and patents for exports, followed by construction, telecommunication and insurance. If in the construction, telecommunication, export sales are shared by few exporters, it is not the case in the insurance sector: export sales are shared by three to four times more firms.

When we look more into the details of “other business services” (panel (a) in figure 1), we see that research & development accounts for more than 60% of export sales, and involve more than 42% of exporters of OBS. Next come overhead services with more than 20% of export sales.

Most of trade in services is made with European countries (about half), and North American countries (Canada, U.S. and Mexico) (20%) (Figure 3). Although the share of East-Asian markets in total imports is fairly stable over the period (3%), its share of exports declined (from 6% in 1999 to 3% in 2007). The picture is similar if we look at the geographic distribution of firms, rather than exports or imports.

Figure 2: Distribution of Exports and Firms in Other Business Services

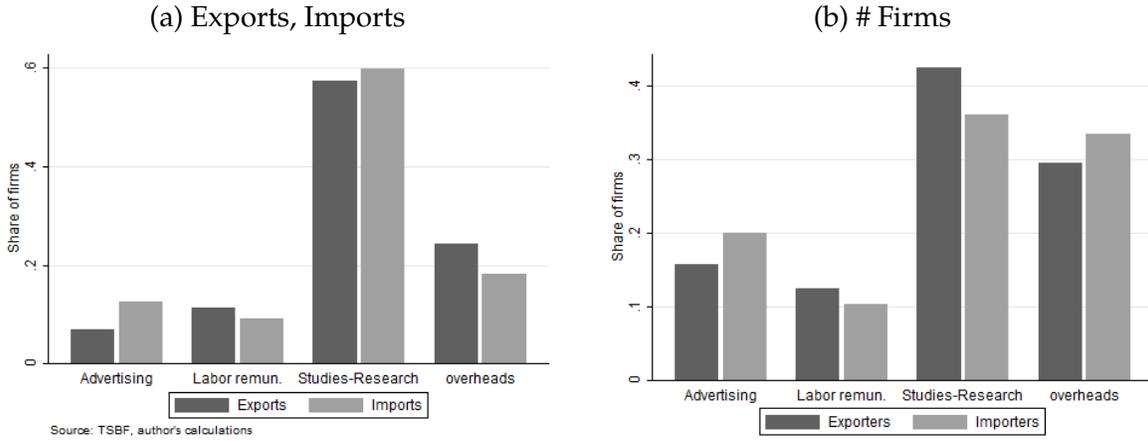
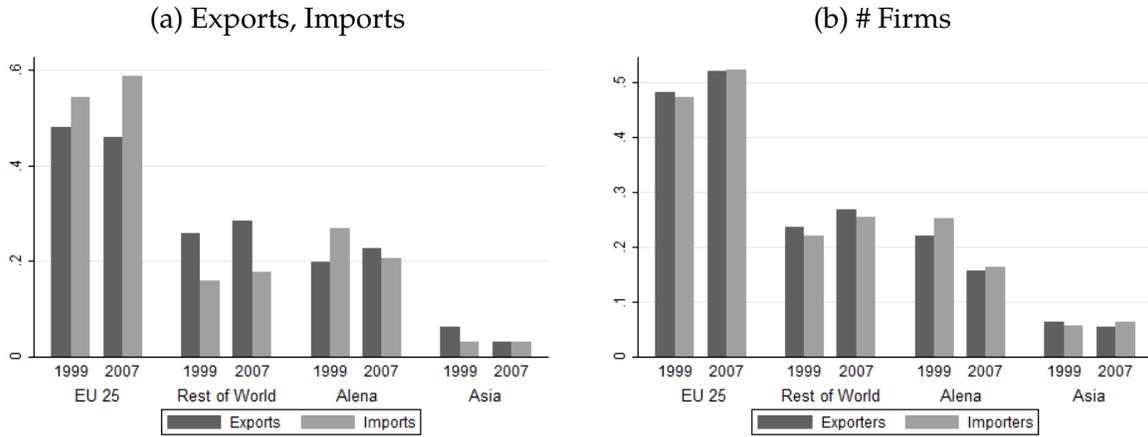


Figure 3: Geographic Distribution of Exports and Firms

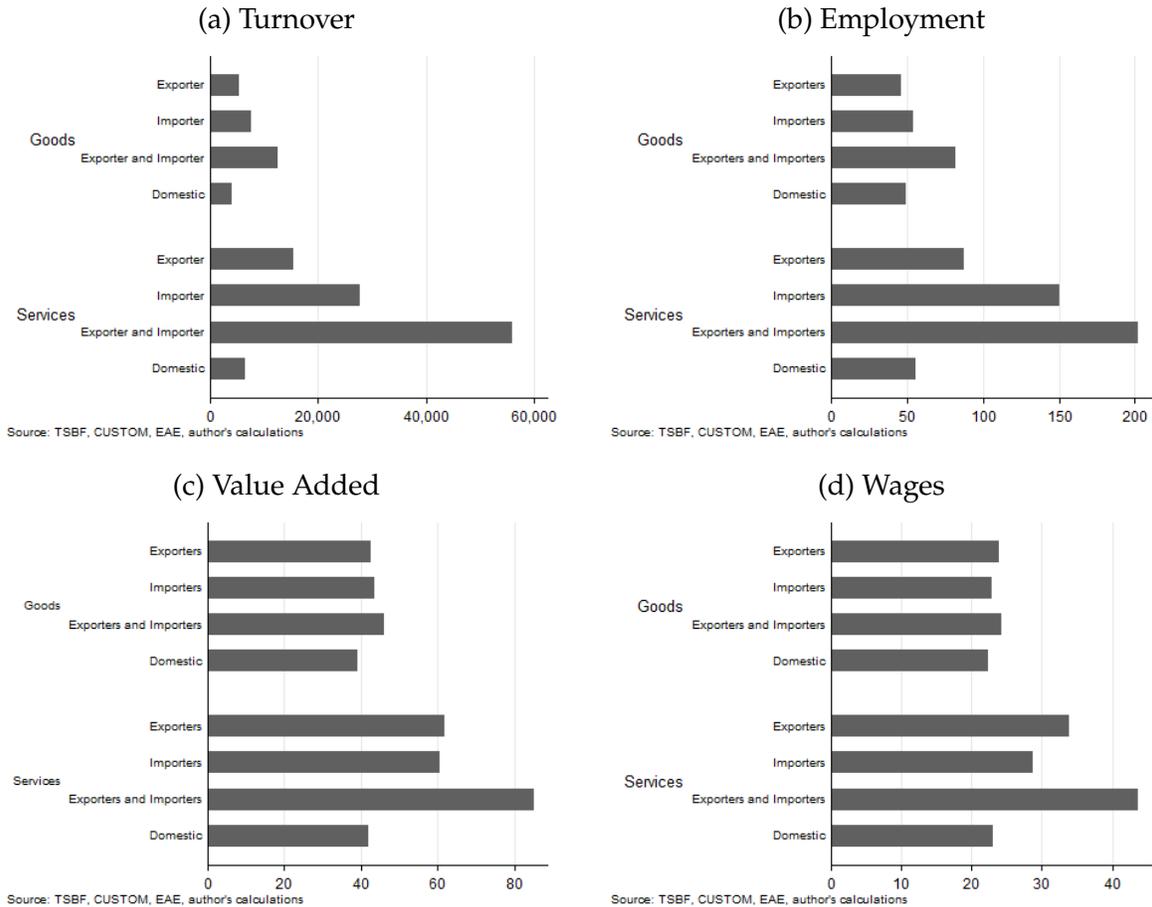


### 3.1 Comparison between trade in goods and trade in services

Does a firm that trade services has the same characteristics as a firm that trade goods? The link between firm characteristics (size, productivity) has been widely studied during the past decade.<sup>2</sup> We replicate this exercise for firms involved in trade in services. Data on firm characteristics come from the Annual Business Survey (EAE). We keep four firm characteristics for our analysis: total turnover, employment, labor productivity (value added per employee) and individual wage. We link these four characteristics with four different trade status: only exporter, only importer, exporter and importer, and non-trader. Results are shown in figure 4.

<sup>2</sup>see Wagner (2007) for a survey.

Figure 4: Firm characteristics for traders/non-traders of goods/services

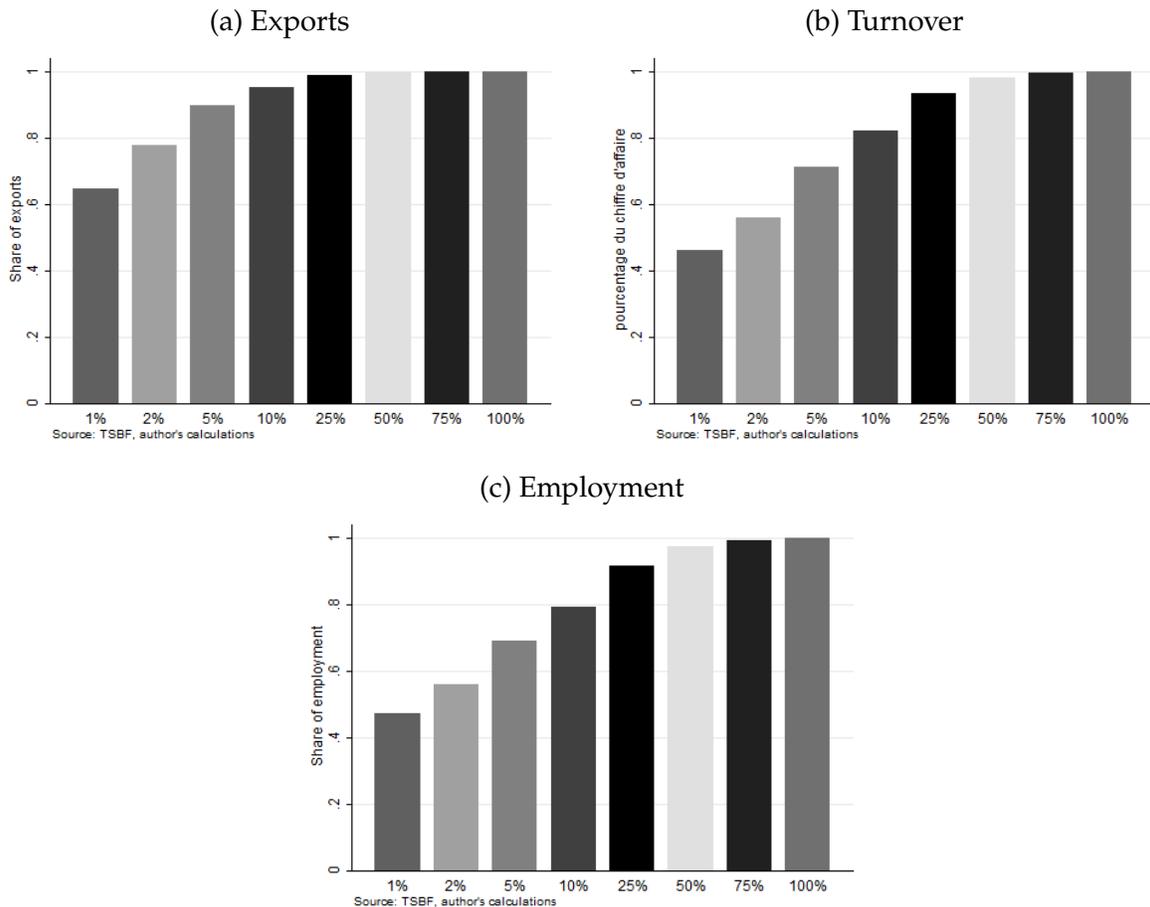


Firms engaged in international trade in services seem to enjoy the same kind of premia that firms trading goods enjoy: they are larger, more productive, and pay higher wages than domestic firms (Bernard and Jensen 1999, Bernard et al. 2007).<sup>3</sup> This fact is already reported in (Breinlich and Criscuolo 2011) and is consistent with the hypothesis of higher fixed costs of exporting for firms trading services than for firms trading goods. The larger average size of firms trading services can reveal a tougher selection process. Only very large firms, or with the sufficient level of productivity can bear the fixed cost incurred when starting to export services. Caution is needed when looking at these stylized facts however, as some firms may well be exporting goods and services at the same time. Thus, the premia we identify may be (partly) driven by the fact that these firms are exporting both goods and services.

We observe large differences between firms with different trading activities. But within a group of, say exporters, many differences also exist. The concentration of turnover, em-

<sup>3</sup>Premia on labor productivity are higher than the premia on wages, which suggest that exporters of services are more profitable than domestic firms.

Figure 5: Cumulated distribution for exporting firms



ployment and exports among firms is a good way to detect heterogeneity within a subset of firms. Figure 5 displays these statistics. The top percentile of the distribution of exporters accounts for more than 40% of total turnover, 40% of employment and makes more than 60% of total exports. The first decile raises sharply these figures to 80% of turnover and nearly 95% of exports. The 5% of exports of services left are to be divided between 90% of firms. The concentration is larger than for firms trading goods. Based on firm-level data on French exporters, (Mayer and Ottaviano 2008) show that the top 5% of exporters make 70% of total exports, and the top 10% makes up to 90%. For trade in services, the concentration is higher as, for the same share of exporters, the shares rise to 90% and 95% respectively. While (Mayer and Ottaviano 2008) qualify these firms as "superstars", we could say that in trade in services, we are dealing with "super-superstars".

We next compare the geographic distribution with the number of services or goods actually exported (table 3.1). We see that more than half of exporters are exporting one service to one destination. This figure is much larger than for trade in goods, as only 29% of firms export one product to one destination. Obviously, these figures are not directly com-

Table 2: Share of exporters in 2004

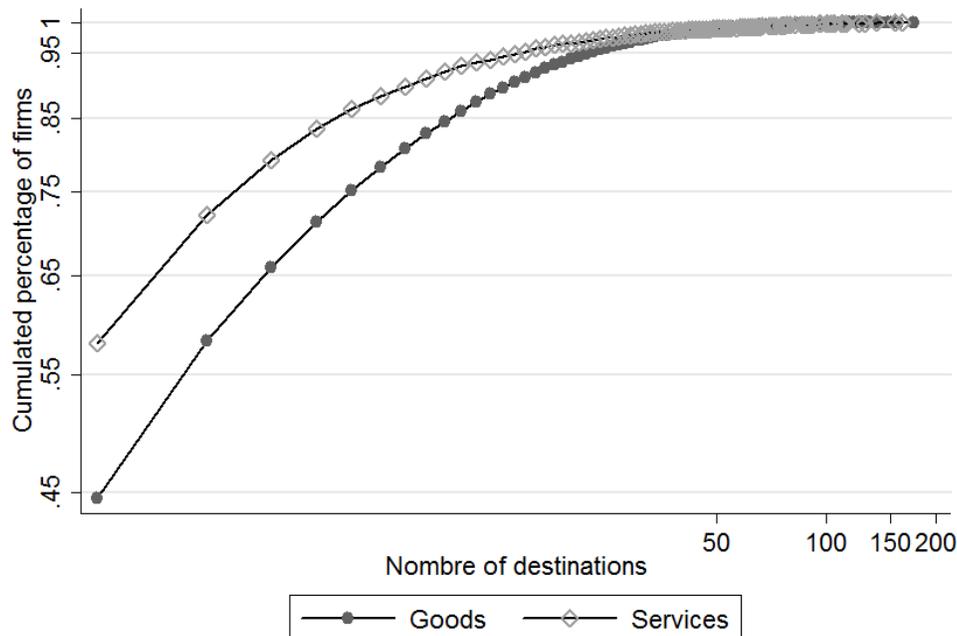
		Number of countries			
		1	2-5	5 or more	Total
<b>Number of Services</b>	1	51.62	14.29	3.03	68.95
	2	4.94	13.81	6.59	25.34
	3 and more	0.21	0.92	4.59	5.71
	<i>Total</i>	56.77	29.02	14.21	100.00

Table 3: Share of export values in 2004

		Number of countries			
		1	2-5	5 or more	Total
<b>Number of Services</b>	1	5.77	3.83	8.18	17.77
	2	2.25	3.60	20.22	26.07
	3 and more	0.05	0.51	55.59	56.15
	<i>Total</i>	8.07	7.94	83.99	100.00

parable, as the custom database for trade in goods records over 10,000 products, while we only have 21 services. There is however a correlation between the number of destination countries and the number of services exported. While most exporters concentrate their exports on one country and one product, firms that export more than 3 services usually export to more than five destinations.

Figure 6: Share of firms exporting goods or services per destination market



Source: CUSTOM, TSBF

The picture is similar when we look at the distribution of firms given their number of trade partners (Figure 6). While 42% of French firms export goods only to one destination, they are around 58% to export services to only one destination. If we look at importers instead, the concentration is also higher for importers of services: 52% import services from one country, and 40% import goods from only one country.<sup>4</sup>

### 3.2 Manufacturing Firms versus Service Firms

Are exporters of services mainly firms from the service sector, or are they manufacturing firms with a secondary activity in services? To answer this question, we split our sample according to the main activity of the firm (NAF code). Example of cross-analysis are numerous: one can think about a firm from the car industry (manufacturing sector) selling licenses and patents to a foreign firm (export of services), or firms specialized in research & development in the IT sector (service sector) selling hardware on a CD to foreign firms (export of goods). We find four large differences according to the sector of the firm:

1. In 1999 and 2004, there were five times more exporters of services from the service sector (84%) than from the manufacturing sector (16%). In value, this ratio slightly decreases, with 76% of total export values accounted by firms from the service sector.
2. The second difference between exporters has to do with the nature of the service exported. In the manufacturing sector, 95% of firms exports one of the following type of service: license and patents, other business services (research & development, advertising, overhead services), or insurance services. In the service sector however, the distribution is not so much concentrated in few services, even if the “other business services” account for a large share of exporters and exports.
3. Productivity and employment premia are very different for service and manufacturing firms. We look at the firm characteristics given its trade status (exporter only, importer only, exporter and importer, non-trader). We find that firms from the service sector which also export and/or import goods<sup>5</sup> are as big as firms from the manufacturing sector (the size being measured by the number of employees). We also find that firms in the service sector exporting services are on average half the size of the manufacturing firms exporting services. They are between three times smaller when they import services, and five times when they both import and export services. The size of the firm does not seem to matter much when it comes to trade in services, as small firms are able to export and/or import services. However, firms from the service sector which export and/or import services are systematically more productive and pay higher wages than firms from the manufacturing sector. This confirms the result found by (Breinlich and Criscuolo 2011) on UK data.
4. The fourth important difference we find is the relationship between export of goods and export of services. This relationship strongly depends on the sector of the firm (see Table 3.2). The majority of exports made by manufacturing firms is made by

---

<sup>4</sup>The figure is not shown here, but available upon request.

<sup>5</sup>This holds whatever the activity of the firm: Export, import, or export and import.

the exports of goods: 96% of firms only export goods and account for about 2/3 of total exports. Also, the data show that manufacturing firms export services only when they export goods: Only 0.18% of manufacturing firms export only services, and only 3.6% export both goods and services. Nevertheless, this last group of firms accounts for 27% of exports of goods and services in the manufacturing sector.

Table 4: Type of product exported in the manufacturing and service sector in 2004

Exports	Manufacturing Sector		Service Sector	
	Share of Firms	Share of Exports	Share of Firms	Share of Exports
Goods only	96.20	73.20	58.76	12.24
Services only	0.18	0.05	28.43	15.76
Goods and Services	3.62	26.75	13.8	72.99

In the service sector, 24.43% of firms export only services, and account for 15.76% of total export of the sector.

In the service sector, firms behave quite differently: Figures for 2004 show that:

- 28% export only services, and account for 16% of total exports of services
- About 58% export only goods and make about 12% of total exports.
- The bulk of exports of services is in fact made by firms which export both goods and services: These firms (14% of the population of service exporters) account for 73% of total exports of services.

The different behavior of firms in the manufacturing sector and service sector has not been highlighted in the literature before, and it deserves particular attention. In the manufacturing sector, a service is generally exported as a by-product of (or as a complement for) an export of a good. Both exports are linked. However, in the service sector, we do not observe any obvious link between export of goods and export of services: 28% of firms export only services, 58% export only goods, and 14% export both. As an example, we looked at the distribution of exporters according to the product they export (good, service, or both) in some service sectors.<sup>6</sup> As expected, in activities such as jurists, real estate, market studies, almost all the firms export services. However, in activities such as secretariat, translation offices, software, most of the firms export their service embodied in a good: CD, DVD, and these exports are registered as exports of goods, not services. More, in the film distribution industry, about 40% of firms export goods (probably film rolls) and services the same year. To summarize, we observe a strong heterogeneity in the relationship between exports of goods and services at the firm-level. For some activities (e.g. export of software on a CD) both activities are linked and appear complementary (although it may also depend on how the statistics on the exports of goods and services are collected), while both exports do not seem to be correlated in other sectors (e.g. real estate, market studies).

<sup>6</sup>Results are not shown here but available upon request

## 4 Econometric results

So far, the evidences show that:

- Large fixed cost must exist in the service export market since only large and very productive firms are able to export services
- Exports of services are tightly linked to the exports of goods in the manufacturing sector, the link is much weaker in the service sector
- There are structural differences between exporters from the manufacturing sector and the service sector

### 4.1 Export Decision Equation

We follow Bernard and Jensen (2004) and Bernard and Wagner (2001) and estimate the export decision of the firm. We estimate the following equation:

$$Y_{i,t} = \theta_1 Y_{i,t-1} + \theta_2 Y_{i,t-2}(1 - Y_{i,t-1}) + \gamma Z_{i,t-1} + \beta X_{I,t} + \epsilon_{I,t} \quad (1)$$

With  $Y_{i,t-1}$  the export status of the firm  $i$  in time  $t - 1$ . As in Bernard and Jensen (2004), the past export status in  $t - 1$  and  $t - 2$  must increase the probability of exporting at time  $t$ , especially if sunk costs are high. If, however, we do not find any significant effect of the past export status, we can then assume that sunk costs are not large.  $Z_{i,t-1}$  is a vector of firm characteristics (employment, productivity, turnover) in time  $t - 1$ . Productivity is measured as a Solow residual.<sup>7</sup> We also include information on the ownership of the firm. We lag the firm-level variables to avoid as much as possible any endogeneity between the current status and the actual performance of the firm. Finally,  $X_{i,t}$  is a dyadic industry-time fixed effect, controlling for specific shocks at the industry level.  $\epsilon_{i,t}$  is the error term.

We first estimate this equation using simple OLS. However, linear probability models suffer from well-known issues, in particular the fact that predicted probabilities can lie beyond the  $[0, 1]$  interval. The literature also shows that this kind of method may overestimate the estimated coefficient in the presence of unobserved factors, such as the quality of management or the firm technology. If these are positively correlated with the right-hand-side variables, then the estimated coefficients will be overestimated. To deal with these issues, we assume that the heterogeneity induced by these factors is not persistent over time (and follows a random process). Therefore we use a probit estimation with random effects. However, it is also possible that some firm-level characteristics are persistent over time. Fixed effects are usually used to deal with this issue, or first-difference estimations.<sup>8</sup> Our dataset cannot fit this kind of estimation as it covers too few years (only five,

---

<sup>7</sup>We tried several measures of productivity: Value added per employee, productivity from a Cobb-Douglas production function with and without return to scale. All measures lead to similar results. We retained here the residual from a Cobb-Douglas production function with constant return to scale as measure for productivity.

<sup>8</sup>It is well known that the use of lagged variables can create problems of endogeneity with the dependent variable. The literature suggests to deal with this issue by using instrumental variables, of the method of generalized moments (Bernard and Wagner 2001).

with the lagged variables). To limit the estimation bias, we replace in equation (1) the past export status by the change in export status in  $t - 1$ . Basically, we look if the firm is exporting for the first time in  $t - 1$ . If this is the case, then the new variable takes the value 1, and 0 otherwise. The change of status should depend less on unobservable characteristics of the firm than the past status itself. We investigate the link between the entry in the export market in  $t - 1$  and the current status. A strong link between the two variables would suggest a fixed cost paid in  $t - 1$  which would have to be recovered through export in time  $t$ . We define  $E_{I,t-1} = 1$  as the new-entrant status of the firm in  $t - 1$ . We then estimate the alternative equation:

$$Y_{i,t} = \theta_3 E_{i,t-1} + \gamma Z_{i,t-1} + \beta X_{I,t} + \epsilon_{I,t} \quad (2)$$

## 4.2 Link between export of services and export of goods

The relationship between export of goods and export of services can be linked to both demand or supply mechanism. In the case of a complementarity between goods and services, foreign demand for services produced by a firm can go along with the demand for the goods produced by the same firm. Unfortunately, we cannot identify the client of the firm, only the country of destination. On the supply side, costs can help us understand the relationship between export of goods and export of services. More precisely, costs can be specific to the service exported, common to the export of goods and services, or they can be joint costs. We will detail the difference between the three costs later on. We implicitly assumed in equations (1) and (2) that the entry costs in the service export market are specific to services: they only depend on the past export status of services ( $Y_{i,t-1}$  and  $Y_{i,t-2}$ ). However, one can argue that the costs of entering a new market only depend on the destination market, and not so much on the type of product (i.e. a good or a service) sold on that market. Exports of services can be motivated by the fact that a firm has already paid this entry cost, by exporting goods in the past to this market. A firm can for instance invest into distribution networks in a foreign country, which can be beneficial to both its exports of goods and services even if both products are not necessarily linked. In this case, we will talk about common costs. To test this hypothesis, we can introduce in equations (1) and (2) a variable accounting for previous exports of goods. If this new variable increases the probability of exporting services, then we will conclude that we are dealing with common costs. Finally, there also exists entry costs linked to the export of a joint product: a good and a service. If, as the data suggest, some services are only exported when goods are exported, the entry cost for service is linked to the product (a good) which makes the export of this service possible. A way to test this hypothesis is to introduce a dummy that takes 1 if the firm is exporting goods and services at the same time, to the same country, and 0 otherwise.

### 4.3 Different behavior of firms from the manufacturing sector and firms from the service sector

We present the results separately for the manufacturing sector and for the service sector. Linear probability models have an interesting feature: the adjustment coefficient ( $R^2$ ) obtained in the two regressions can be compared. Also, we want to look at the explanatory power of the costs incurred in the export market in explaining the present pattern of trade in the manufacturing and service sector. More generally, the idea is to study the different behavior of firms in the two sectors

#### 4.3.1 Results for the manufacturing sector

As in Bernard and Jensen (2004) and Bernard and Wagner (2001), the export probability is higher the larger and the more productive the firm is (see table 5, column 1). However, being part of a Group (being the Headquarter or an affiliate), or from a joint venture does not seem to confer an additional advantage for exporting services. Firms part of a foreign group however have a slightly higher (+0.8%) probability to export services. More, if the past export status are taken into account in  $t - 1$  and  $t - 2$ , its probability would increase by 50% and 13% respectively. Results are quantitatively identical when using random effect instead. When we use a random effect probit instead, the point estimates are lower (see column 3). Always significant, they remain consistent with the existence of fixed costs of exporting. For instance, the additional effect of being part of a foreign group is lowered to 0.5%. Being part of a French group (Headquarter or affiliate) is now an additional factor that increases the export probability. Until now, we supposed that only previous exports of services could affect the current exports. But, as we mentioned, the entry fixed costs when exporting services may not be specific to services. They can be common to both services and goods. Alternatively, they can have an even more specific nature, and be joint costs, linked to a bundle good-service. In the following, we try to identify the three type of entry cost. We first include the export status of goods (column 4), in  $t - 1$  and  $t - 2$ . Having exported goods may help you to export services. This effect is very small (+0.8%) or not significant compare to the being an exporter of services in  $t - 1$  (+12.9%). Exporting goods two years ago has no significant effect on the export of services today. The stylized facts presented in the previous section suggest a strong correlation between the export status of services and the export status of goods and services, in the manufacturing sector (almost all the manufacturing firms exporting services also export goods). For this reason, we cannot introduce both variables in our regression. We replace the export status of services in  $t - 1$  and  $t - 2$  by the export status of goods and services in  $t - 1$  (see column 5).<sup>9</sup> Results show that being an exporter of goods and services in the previous period has the same effect as being an exporter of services only. We are not able to disentangle the two effects. We then replace the past export status variables by the entry variable in  $t - 1$  (see column 6 and 7). Here, the correlation between the entry on the service market and the joint entry on the good and service markets is only 0.50, which allows us to introduce both variables in the same regression (column 7). In particular, as soon as we introduce

---

<sup>9</sup>If we consider firms that exported goods and services in  $t - 2$  but not in  $t - 1$ , we are left with only 9 observations.

Table 5: Determinants of the Export Decision in the Manufacturing Sector

	Linear Probability		Random Effect Probit				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Export of Services <sub>t-1</sub>	0.507 <sup>a</sup> (0.013)	0.478 <sup>a</sup> (0.013)	0.325 <sup>a</sup> (0.014)	0.294 <sup>a</sup> (0.014)			
Export of Services <sub>t-2</sub>	0.128 <sup>a</sup> (0.014)	0.129 <sup>a</sup> (0.014)	0.071 <sup>a</sup> (0.010)	0.061 <sup>a</sup> (0.009)			
Export of Goods <sub>t-1</sub>				0.008 <sup>a</sup> (0.001)	0.008 <sup>a</sup> (0.001)		
Export of Goods <sub>t-2</sub>				0.000 (0.003)	0.001 (0.003)		
Exp. of Good and Services <sub>t-1</sub>					0.281 <sup>a</sup> (0.014)		
1 <sup>st</sup> Exp. of Services <sub>t-1</sub>						0.131 <sup>a</sup> (0.013)	0.007 (0.020)
1 <sup>st</sup> Exp. of Goods <sub>t-1</sub>						-0.005 (0.001)	-0.007 <sup>a</sup> (0.001)
1 <sup>st</sup> Exp. of Goods and Services <sub>t-1</sub>							0.095 <sup>b</sup> (0.081)
Employment <sub>t-1</sub>	0.015 <sup>a</sup> (0.001)	0.016 <sup>a</sup> (0.001)	0.005 <sup>a</sup> (0.000)	0.004 <sup>a</sup> (0.000)	0.005 <sup>a</sup> (0.000)	0.010 <sup>a</sup> (0.000)	0.010 <sup>a</sup> (0.000)
Productivity <sub>t-1</sub>	0.020 <sup>a</sup> (0.002)	0.021 <sup>a</sup> (0.002)	0.008 <sup>a</sup> (0.001)	0.006 <sup>a</sup> (0.001)	0.008 <sup>a</sup> (0.001)	0.013 <sup>a</sup> (0.001)	0.013 <sup>a</sup> (0.001)
Belongs to a Group	-0.001 (0.001)	-0.001 (0.001)	0.004 <sup>a</sup> (0.001)	0.003 <sup>a</sup> (0.001)	0.004 <sup>a</sup> (0.001)	0.004 <sup>a</sup> (0.001)	0.004 <sup>a</sup> (0.001)
Headquarter	0.000 (0.003)	0.000 (0.003)	0.006 <sup>a</sup> (0.002)	0.004 <sup>a</sup> (0.002)	0.005 <sup>a</sup> (0.002)	0.010 <sup>a</sup> (0.002)	0.009 <sup>a</sup> (0.002)
Joint-Venture	0.015 (0.010)	0.016 (0.011)	0.010 (0.006)	0.009 (0.006)	0.012 <sup>c</sup> (0.007)	0.015 <sup>a</sup> (0.007)	0.015 <sup>a</sup> (0.007)
Foreign Group	0.008 <sup>a</sup> (0.002)	0.008 <sup>a</sup> (0.003)	0.005 <sup>a</sup> (0.001)	0.004 <sup>a</sup> (0.001)	0.005 <sup>a</sup> (0.001)	0.008 <sup>a</sup> (0.001)	0.008 <sup>a</sup> (0.001)
Constant	-0.050 <sup>a</sup> (0.007)	-0.053 <sup>a</sup> (0.007)					
Observations	54,448	54,448	54,448	54,448	54,448	54,448	54,448
R <sup>2</sup>	0.32	0.32					

Significance levels: <sup>c</sup>  $p < 0.1$ , <sup>b</sup>  $p < 0.05$ , <sup>a</sup>  $p < 0.01$ . Column (1) reports export probability estimates using OLS estimator, column (2) reports export probability estimates using the panel with random effect estimation. Columns (3) to (7) report export probability using random effect probit estimation. Marginal Effects reported. Productivity is calculated as the Solow residual from a Cobb-Dougllass production function with constant return to scale.

the joint-entry variable (column 6), the coefficient on the past export status of services becomes non-significant. Therefore, we can say that the decision to export services in the manufacturing sector depends positively on joint costs previously accounted for by the firm.

### 4.3.2 Results for the service sector

While the exports of services are not entirely dominated by firms from the service sector, it is not surprising to see a certain persistence in the participation of these firms to the

Table 6: Determinants of the Export Decision in the Service Sector

	Linear Probability		Random Effect Probit				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Export of Services <sub>t-1</sub>	0.743 <sup>a</sup> (0.009)	0.681 <sup>a</sup> (0.011)	0.702 <sup>a</sup> (0.011)	0.684 <sup>a</sup> (0.012)			
Export of Services <sub>t-2</sub>	0.270 <sup>a</sup> (0.023)	0.292 <sup>a</sup> (0.024)	0.305 <sup>a</sup> (0.026)	0.291 <sup>a</sup> (0.026)			
Export of Goods <sub>t-1</sub>				0.036 <sup>a</sup> (0.006)	-0.028 <sup>a</sup> (0.005)		
Export of Goods <sub>t-2</sub>				0.022 <sup>b</sup> (0.009)	0.096 <sup>a</sup> (0.013)		
Exp. of Goods & Services <sub>t-1</sub>					0.718 <sup>a</sup> (0.020)		
1 <sup>st</sup> Exp. of Services <sub>t-1</sub>						0.290 <sup>a</sup> (0.024)	0.140 <sup>a</sup> (0.022)
1 <sup>st</sup> Exp. of Goods <sub>t-1</sub>						-0.029 <sup>a</sup> (0.010)	-0.036 <sup>a</sup> (0.001)
1 <sup>st</sup> Exp. of goods & services <sub>t-1</sub>							0.399 <sup>b</sup> (0.045)
Employment <sub>t-1</sub>	0.010 <sup>a</sup> (0.002)	0.012 <sup>a</sup> (0.002)	0.008 <sup>a</sup> (0.002)	0.007 <sup>a</sup> (0.002)	0.017 <sup>a</sup> (0.002)	0.028 <sup>a</sup> (0.002)	0.028 <sup>a</sup> (0.002)
Productivity <sub>t-1</sub>	0.021 <sup>a</sup> (0.002)	0.025 <sup>a</sup> (0.003)	0.021 <sup>a</sup> (0.002)	0.021 <sup>a</sup> (0.002)	0.061 <sup>a</sup> (0.003)	0.072 <sup>a</sup> (0.003)	0.071 <sup>a</sup> (0.003)
Belongs to a Group	0.014 <sup>a</sup> (0.003)	0.017 <sup>a</sup> (0.004)	0.025 <sup>a</sup> (0.004)	0.022 <sup>a</sup> (0.004)	0.050 <sup>a</sup> (0.005)	0.057 <sup>a</sup> (0.004)	0.057 <sup>a</sup> (0.004)
Headquarter	0.034 <sup>a</sup> (0.007)	0.038 <sup>a</sup> (0.008)	0.059 <sup>a</sup> (0.012)	0.049 <sup>a</sup> (0.011)	0.095 <sup>a</sup> (0.014)	0.123 <sup>a</sup> (0.014)	0.122 <sup>a</sup> (0.014)
Joint-Venture	0.018 (0.012)	0.025 <sup>c</sup> (0.014)	0.038 <sup>c</sup> (0.023)	0.034 (0.022)	0.052 <sup>c</sup> (0.027)	0.075 <sup>a</sup> (0.031)	0.075 <sup>b</sup> (0.032)
Foreign Group	0.016 <sup>b</sup> (0.0067)	0.021 <sup>a</sup> (0.007)	0.014 <sup>b</sup> (0.005)	0.011 <sup>b</sup> (0.005)	0.067 <sup>a</sup> (0.008)	0.074 <sup>a</sup> (0.008)	0.073 <sup>a</sup> (0.008)
Constant	-0.019 (0.022)	0.001 (0.027)					
Observations	18,507	18,507	18,507	18,507	18,507	18,507	18,507
R <sup>2</sup>	0.60	0.60					

Significance levels: <sup>c</sup>  $p < 0.1$ , <sup>b</sup>  $p < 0.05$ , <sup>a</sup>  $p < 0.01$ . Column (1) reports export probability estimates using OLS estimator, Column (2) reports export probability estimates using the panel with random effect estimation. Columns (3) to (7) report export probability using random effect probit estimation. Marginal Effects reported. Productivity is calculated as the Solow residual from a Cobb-Douglas production function with constant return to scale.

exports of services. The sum of the coefficient of the past export status is close to 1 in all the specifications (OLS, random effect panel or probit with random effect). Being part of a Group increases significantly the probability for the firm to export services, especially for the Headquarter. Being part of a foreign group has a much larger impact in the service sector than it has in the manufacturing sector (between +1.1% and +7.2%, compare with 0.4% and +1% respectively). The impact of productivity is also stronger than in the manufacturing sector. The past export of goods increases the probability of exporting services much more than in the manufacturing sector: +3.6% in  $t - 1$  and +0.2% in  $t - 2$  (table 5 column 4) compare to only +0.8% in  $t - 1$  in the manufacturing sector (table 6 column 4).

It seems that being an exporter of goods is an advantage for firms from the service sector that want to export services. If we look at the impact of a previous joint export of goods and services (table 5 column 5), we get a very high coefficient (0.718), more than twice the coefficient in the manufacturing sector (0.281). Surprisingly, the coefficient on the past export of goods becomes negative, but this effect is largely compensated by a large coefficient on the past export of goods in  $t - 2$ , almost +10%. In columns (6) and (7), we use the new-entrant status in  $t - 1$ . It confirms a greater persistence of firms from the service sector, revealing the presence of large specific costs in the export of services (point estimates of 0.29 in column 6 compare to 0.13 in table 5). When we introduce a dummy controlling for a simultaneous entry in both the good and service export market in  $t - 1$  (column 7), the coefficient on the entry in the good market becomes negative, but the coefficient on the entry on the service market stays positive (0.14). Note that this impact disappears for firms from the service sector. The dummy on the simultaneous entry on both markets remains highly significant and quite large (0.399). Therefore, if the export of services in the service sector is partially independent from any manufacturing activity, there seems to have a role for joint products, as in the manufacturing sector. The results we obtain point to a complementarity between export of goods and service, both in the service and manufacturing sector.

## 5 Concluding Remarks

In the light of this first analyze on individual data of trade in services, many questions need to be explored. The persistence of the exporter status (or importer) can be interpreted by fixed and/or sunk costs. The understanding of these costs is highly relevant if policymakers want to help small and medium enterprises in the internationalization of their activity, or help them to enter new markets. Also, the geographical dimension of trade in services has not been exploited here. With gravity models, we can get precious information on the various obstacle firms face in the international service markets. Finally, our results highlight the necessity to consider jointly exports of goods and services, especially in the manufacturing sector, in both theory and empirical analysis.

## References

- Bensidoun, I. and D. Ünal Kesenci (2008). Globalisation in Services: From Measurement to Analysis. OECD Statistics Working Papers 2008/3, OECD, Statistics Directorate.
- Bernard, A. and J. Wagner (2001). Export entry and exit by German firms. *Review of World Economics (Weltwirtschaftliches Archiv)* 137(1), 105–123.
- Bernard, A. B. and J. B. Jensen (1999). Exceptional Exporter Performance: Cause, Effect, or Both? *Journal of International Economics* 47(1), 1–25.
- Bernard, A. B. and J. B. Jensen (2004). Why Some Firms Export. *The Review of Economics and Statistics* 86(2), 561–569.
- Bernard, A. B., J. B. Jensen, S. J. Redding, and P. K. Schott (2007). Firms in International Trade. *Journal of Economic Perspectives* 21(3), 105–130.
- Breinlich, H. and C. Criscuolo (2011). International Trade in Services: A Portrait of Importers and Exporters. *Journal of International Economics* 84(2), 188–206.
- Fontagné, L. and G. Gaulier (2009). Performances à l’exportation de la France et de l’Allemagne. Rapport du cae, la documentation française.
- Head, K., T. Mayer, and J. Ries (2009). How Remote is the Offshoring Threat? *European Economic Review* 53(4), 429–444.
- Irac, D. (2008). Total Factor Productivity and the Decision to Serve Foreign Markets: Firm Level Evidence from France. Banque de France working paper 205.
- Jean, S. (2002). International Trade and Firms’ Heterogeneity under Monopolistic Competition. *Open Economies Review* 13(3), 291–311.
- Lennon, C. (2009). Trade in Services and Trade in Goods: Differences and Complementarities. The Vienna Institute for International Economic Studies Working Papers 53.
- Mayer, T. and G. Ottaviano (2008). The Happy Few: The Internationalisation of European Firms. *Intereconomics: Review of European Economic Policy* 43(3), 135–148.
- Melitz, M. J. (2003). The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica* 71(6), 1695–1725.
- Roberts, M. J. and J. R. Tybout (1997). The Decision to Export in Colombia: An Empirical Model of Entry with Sunk Costs. *American Economic Review* 87(4), 545–64.
- Sicsic, P. (2006). Are there more and more missing imports of services in the French Balance of Payments? Paper presented at the NBER/CRIW conference on “International Service Flows”.
- Wagner, J. (2007). Exports and Productivity: A Survey of the Evidence from Firm-level Data. *The World Economy* 30(1), 60–82.