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**THE PERFORMANCE OF TRADING  
FIRMS IN THE SERVICES SECTORS  
– COMPARABLE EVIDENCE FROM  
FOUR EU COUNTRIES<sup>1</sup>**

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## Abstract

We analyse common stylized facts of services firms engaged in trade in a comparative study across four EU member countries. We find that, though relatively less engaged in trade than manufacturing firms, services firms have similar traits. Services firms are more likely to import than to export. Their prevalent type of trade is trade in goods. The complexity of trade activities is increasing in firm size and productivity. Two-way traders outperform one-way traders. Services are more likely to be traded by firms already engaged in trade of goods. Changes in trading status by either adding another dimension of trade (imports, exports) or another type of product (goods, services) are infrequent and are associated with significant pre-switching premia. In contrast, learning effects from switching trading status are uncommon. This evidence points to significant fixed cost of being engaged in trade. Thus, the literature on heterogeneous firms is able to explain the sorting of firms into trading and non-trading firms in the services sectors as well.

Keywords: services sectors, exports, imports, trade in goods and services, trade premia

JEL codes: F14, F19, F23

## 1. Introduction

Along with the service sector accounting for an ever larger share of GDP in most developed countries, trade in services is also on the rise. We have only recently started to learn what the characteristics of firms that trade services are (Breinlich and Criscuolo, 2011). In contrast, for trading firms in the manufacturing sectors it is well established that they are larger, more productive, more capital- and skill-intensive and they pay higher wages than firms that do not trade. This literature has long focussed on premia for exporting firms. It goes back to Bernard and Jensen (1995, 1999) and has been surveyed by Greenaway and Kneller (2007) and Wagner (2007, 2012). More recent evidence – based again on manufacturing firms – has shown that also importing firms are more productive than non-trading firms, and that firms which import and export tend to outperform firms that engage in only one dimension of trade (Andersson et al., 2008; Muûls and Pisu, 2009; Castellani et al., 2010; Altomonte and Békés, 2009; Kasahara and Lapham, 2008).

In this paper we examine whether firms operating in market service sectors that engage in trade also differ from their non-trading counterparts. We examine performance along firm's trajectories into trade and we distinguish between trade in goods and trade in services. In particular, we compare the established traders (firms that export and/or import) and trade starters (firms that start to export/import) in terms of size, average wages paid and productivity for four countries that are members of the European Union (EU), namely Finland, France, Ireland and Slovenia. The answer to this question is not trivial as services frequently cannot travel unaccompanied across borders but require the producer and the consumer to be physically present at the same time in the same place. However, both manufacturing and service sector firms trade both goods and services. Furthermore, the answer to this question determines if and to what extent recent models of firm heterogeneity based on the evidence from manufacturing firms (e.g. Melitz, 2003; Bernard et al., 2003) can also account for the sorting of firms into trading and non-trading firms in the services sectors.

A small number of papers already provide evidence in this direction. These papers fall into two categories. The first set examines whether exporting firms have different characteristics than non-exporters in services sectors (Kox and Rojas-Romagosa, 2010; Temouri et al., 2010; Grublješič and Damijan, 2011). The second set examines whether firms that engage in trade in services across manufacturing and services sectors – both exporters and importers – have different characteristics than firms that do not engage in trade in services (Breinlich and Criscuolo, 2010; Gaulier et al, 2011; Kelle and Kleinert, 2010). Haller et al. (2012) combine both approaches. The main message from these papers is that both trade participation as well as trade intensity is lower in services firms than in manufacturing firms. Trade in services is equally if not more concentrated than trade in goods among a few large firms. Firms that trade services tend to be larger, more productive, more skill-intensive and pay higher wages than the non-trading firms in the same industry.

In this paper we will first re-examine some of the questions addressed in the above papers in order to make the case for treating common findings across papers as stylised

facts more compelling. In particular, we gather data for four European countries, which differ sufficiently in terms of size, location and economic characteristics to represent the main characteristics of most other European countries. We compare the performance of non-traders, one-way traders (firms that export only or import only) and two-way traders (firms that export and import). Among exporters and importers we establish whether there are differences in performance between firms that trade services, goods or both. Moreover, we compare the performance of firms that change trading status to those that retain the original trading status. We are thus able to determine whether firms are more productive before changing trading status or whether the new trading status confers specific advantages. The answer to this question has important policy implications.

We present a number of stylized facts on services firms that trade. First, we find that services firms are relatively less engaged in trade than manufacturing firms. Second, similar to manufacturing firms, services firms that engage in trade are larger, pay higher wages and have higher productivity than firms that do not trade. Third, services firms will more likely engage in imports than exports, where the prevalent type of trade is imports of goods only. The complexity of trading activities is increasing in firm size and productivity. Two-way traders always outperform one-way traders. Fourth, trade in services is quite rare, services are more likely to be traded by firms already engaged in goods trade. Fifth, switches in trading status by either adding another dimension of trade (imports, exports) or another type of product traded (goods, services) are infrequent and are associated with significant pre-switching premia. Learning effects from switching trading status are uncommon.

These findings imply that, similar to manufacturing firms, trade by services firms is associated with significant fixed cost of engaging in trade, where the costs of importing are lower than the costs of exporting. At the same time, the costs of trading services are larger than costs of trading goods. This implies that recent models of firm heterogeneity developed for manufacturing firms are also well suited to account for the sorting of firms into trading and non-trading in the services sectors as well.

The remainder of the paper is structured as follows: Section 2 discusses the theoretical background for trade in services and the existing empirical literature. Section 3 introduces the datasets used. Section 4 presents some stylised facts on differences between trading and non-trading firms and presents the estimates of trader premia for firms engaging in one-way and two-way trade in goods, services or both. Section 5 compares firm characteristics when studying firms' trajectories into trade and when adding a new trade dimension. Section 6 offers a discussion and briefly concludes.

## 2. Literature review

In contrast to goods that can travel across borders unaccompanied, services frequently require the physical presence of both the producer and the consumer to be traded. Thus, in the General Agreement on Trade in Services (GATS) the definition of trade in services encompasses four different modes: cross-border supply (mode 1) covers services flows from one country to another country (e.g. banking or architectural services transmitted via telecommunications or mail); consumption abroad (mode 2) refers to situations where a service consumer (e.g. tourist or patient) travels to another country to obtain a service; commercial presence (mode 3) implies that a service supplier of one country establishes a territorial presence, including through ownership or lease of premises, in another country's territory to provide a service (e.g. domestic subsidiaries of foreign insurance companies or hotel chains); and presence of natural persons (mode 4) refers to persons of one country entering the territory of another country to supply a service (e.g. accountants, doctors or teachers).

The theoretical discussion whether existing models of trade (in goods) are suited to also explain trade in services goes back to the 1970s and 1980s. Much of the early literature centres around finding an actual definition of (trade in) services with the emphasis being on the joint production and consumption requirement (Hill, 1977; Deardorff, 1985; Melvin, 1989). Since the mid-1980s a number of contributions concluded that the standard concepts of comparative advantage and theories of the determinants of trade patterns could be applied to services (technology, endowments, the specific factors model, but not the law of one price) (see Hoekman (2006) for a more in-depth discussion).

Bhagwati (1984) argues that the same forces that drive trade in goods will also apply to trade in those services where services can be “splintered” from goods or people (their “carriers”) and thus the joint production and consumption requirement is relaxed. The same applies to exchanges between a resident of one country and another, for example where consumers temporarily move to the location of the service provider or the service provider temporarily moves to the location of the producer. Hindley and Smith (1984) maintain that none of the differences between services and goods trade change the normative implications of existing theoretical approaches. Bhagwati et al. (2004) show that mode 1 trade in services is analytically equivalent to a technical change that lowers the relative price (wage) of more skilled-intensive labor in the importing country. This has distributional consequences among factors of production in that country, but generates an overall gain for the economy in the absence of significant adverse terms of trade effects. Markusen (1989) and van Marrewijk et al. (1997) point out that – similar to a large class of trade in goods models – most producer services are both differentiated and characterised by important scale economies.

More recent models of trade that explicitly account for firm heterogeneity (e.g. Melitz, 2003; Bernard et al., 2003) were developed based on evidence from manufacturing sectors. In these papers only firms that receive a productivity draw above a certain threshold are able to cover the fixed and the variable cost associated with trading. Thus, they are able to replicate the empirical finding that only a certain fraction of firms

engage in trade. In contrast to the literature working with perfectly competitive markets or representative firms described above, these more recent models of international trade have not yet been adapted to trade in services. Whether they need to be adapted depends on whether the stylised facts for firms that engage in services trade are similar to those for firms that trade goods.

First evidence in this direction is provided by two somewhat different sets of papers. The first set examines whether exporting firms have different characteristics than non-exporters in services sectors (Kox and Rojas-Romagosa, 2010; Temouri et al., 2010; Grublješič and Damijan, 2011). The second set examines whether firms that engage in trade in services have different characteristics compared to firms that do not engage in trade in services (Breinlich and Criscuolo, 2010; Gaulier et al, 2011; Kelle and Kleinert, 2010).

Kox and Rojas-Romagosa (2010) show that both export participation and export intensities are lower in services than in manufacturing among Dutch firms. Their regression results suggest that only the most productive and profitable firms export both in manufacturing and in services. They also find evidence that firms self-select into exporting and some indication that they learn from exporting when controlling for the firm's distance to the international technological frontier. Temouri et al. (2010) compare firms in the business services sectors in Germany, France and the UK. They find that exporters are more productive and pay higher wages on average in all three countries, French exporters are also more profitable whereas German exporters are less profitable compared to non-exporters. The results for wages and productivity hold in the years before firms start exporting, which indicates self-selection into exporting of more productive services firms that pay higher wages.

Grublješič and Damijan (2011) show that export behavior of manufacturing and services firms in Slovenia is similar and in line with the big picture that is by now familiar from the literature. Slovenian services firms that export are more productive than non-exporting firms when observable and unobservable heterogeneity is controlled for. Exporter premia of services firms are even larger than in the case of exporting manufacturing firms. Similarly, pre-entry premia over non-exporters are even larger than for manufacturing firms. They find some evidence of significant learning-by-exporting effects for services firms, but only for two services sub-sectors.

Breinlich and Criscuolo (2010) show that there are firms in all sectors of the economy and not only in the services sectors in the UK that engage in services trade. Typically only a small fraction of firms export and/or import services and participation varies substantially across sectors. Like firms that trade goods, firms that trade services differ significantly from firms that do not trade in terms of size, productivity, capital intensity and average wages. Firms that export and import tend to outperform firms that only export and firms that only import, the ranking of the latter two groups varies across performance measures. Firms that export services are also shown to differ to a certain degree from firms that trade goods. The evidence on the number of markets served and the number and value of services traded suggests that, like trade in goods, trade in services is highly concentrated in the hands of a few firms. Gaulier et al. (2011) provide

similar evidence for French exporters of services. They also show that there is persistence in exporting services; this tends to be higher in the services than in the manufacturing sectors. Kelle and Kleinert (2010) produce comparable evidence for services trade by German firms as well as information on mode 3 services trade that is collected as part of the foreign affiliate trade statistics (FATS). As suggested by Breinlich and Criscuolo (2010), these similarities between services and goods trade at the firm level imply that existing heterogeneous firm models for goods trade can also provide a reasonable explanation of trade in services.

### **3. Data**

#### **3.1. Modes of services trade covered by the data**

We use data from the official agency entrusted with data collection in each country. Our data sets span over overlapping but not fully identical periods between 1999 and 2008. While we cannot be fully certain, the information on services traded used here is most likely to cover modes 1, 2 and 4. This is because the sales of services by affiliates of foreign-owned firms (mode 3) are not regarded as trade in services in the national accounts or balance of payments.<sup>1</sup> Descriptions of each country's data sources are provided below. Table 1 provides a summary of the sectors covered in each country.

#### **3.2. Data coverage**

##### ***Finland***

The data for Finland come from three databases: the Business Register, the Structural Business Statistics, and the Statistics on International Trade in Services, all provided by Statistics Finland. The dataset covers all firms in the Business Register using a cut-off limit of 1 employee.<sup>2</sup> It includes around 50,000 services sector firms per year over a period of six years (2002–2007). The dataset on International Trade in Services<sup>3</sup> includes about 2,000 manufacturing and services sector firms per year that are known

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<sup>1</sup> Information on mode 3 is collected separately and is referred to as foreign affiliate trade statistics (FATS). Bhagwati (2004) states that while mode 3 necessarily involves a degree of foreign investment, this is supposed to be minuscule involving only the “right to establish” to distinguish it from full-scale foreign investment. FATS data, however, capture both mode 3 and sales of full-scale foreign affiliates. As a result, existing statistics suggest that “foreign affiliate trade in services” is the largest of the four modes of supply. Based on UNCTAD data for 2004, Hoekman (2006) states that it is currently “about 50 percent greater than total cross border trade flows as registered in the balance of payments (i.e., some \$3.5 trillion)”. Excluding holding companies, Kelle and Kleinert (2010) report a figure of 215.8 billion euros for services exports through commercial presence abroad (mode 3) compared to 86.5 billion euros worth of cross-border services exports (modes 1, 2 and 4 together) for Germany in 2005.

<sup>2</sup> The manufacture of radio, television and communication equipment and apparatus (NACE 32) was removed for confidentiality reasons.

<sup>3</sup> See [http://www.stat.fi/til/pul/2004/pul\\_2004\\_2006-04-21\\_men\\_001\\_en.html](http://www.stat.fi/til/pul/2004/pul_2004_2006-04-21_men_001_en.html) for a methodological description of the Statistics on International Trade in Services in Finland.



to be traders of services on the basis of earlier evidence and other information sources. From conversations with staff at Statistics Finland, we are confident that among the firms with 10 or more employees those not included in the Statistics on International Trade in Services database do not export or import services or only negligibly small values. Thus, our data set allows us to distinguish between goods and services exports. On the import side we are able to identify whether firms trade goods or services or both, but not the value of goods imports.

### ***France***

The data for France come from three different sources. The first source is the firm-level data on services trade from the Banque de France. The data report exports and imports of 17 different services (belonging to Mode 1 services) across 150 countries. Second, we match these data with firm-level data on trade in goods from the French Customs. Trade flows are reported at the country and product (HS8) level. Third, we compile firm-level activity data from the EAE (Enquête Annuelle d'Entreprise – Business surveys) for firms in the services and manufacturing sectors. The business surveys record information such as turnover, employment, value added and capital stock. They cover firms from the manufacturing sector with more than 20 employees and firms from the service sector with more than 30 employees. Firms with less than 30 employees in the service sector are randomly registered each year, and represent around 60% of the service firms in the dataset. When merging the three databases, we are left with roughly one third of the firms trading services (around 4,200 firms each year), which account for about 64% of services exports and 55% of services imports. Data are available from 1999 to 2004.

### ***Ireland***

The services data for Ireland come from the Annual Services Inquiry (ASI) conducted by the Central Statistics Office (CSO). The ASI covers firms in the non-financial market services sectors with at least one person engaged. The database is a census of firms with 20 or more persons engaged and a stratified sample below this threshold with sampling probabilities increasing in firm size. Response to the survey is compulsory. <sup>4</sup> On average over the period there are 11,700 firms per year varying from 9,160 firms in 2003 to 14,860 firms in 2002. The sample is representative of 86,300 firms on average with the total number of firms in these sectors increasing from 72,500 in 2001 to 95,360 in 2007. In the ASI firms are asked what fraction of their exports and imports are services exports and imports. Data for the manufacturing sector in Ireland comes from the Census of Industrial Production which is also conducted by the CSO. This annual census covers all firms with 3 or more persons engaged in mining, manufacturing and utilities.

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<sup>4</sup> Response rates are typically 70% or higher. The use of CSO data in this work does not imply the endorsement of the CSO in relation to the interpretation or analysis of the data. This work uses a research dataset which may not exactly reproduce statistical aggregates published by the CSO. The possibility for controlled access to the confidential micro data set on the premises of the CSO is provided for in the Statistics Act 1993.

## *Slovenia*

The data for Slovenia come from the AJPES (Agency of the Republic of Slovenia for Public Legal Records and Related Services) and from Customs Office of the Republic of Slovenia. The data cover all firms registered in Slovenia obliged to report their annual balance sheets and financial statements. Thus the data represent the whole population of Slovenian firms. Using only information for firms with at least one employee, there are on average 22,123 firms per year across all sectors, varying from 18,120 firms in 2001 to 28,109 firms in 2008. The data contains complete information on goods trade, but only partly on services exports, while information on services imports are not available. Volume of services exports recorded by the Customs Office for firms in the data correspond to about 17 per cent of the volume of services exports as recorded in the BOP. Note that Customs Office collects only data for services that are related to the exports of goods (such as freight and insurance), while for the purpose of the BOP Bank of Slovenia collects data on all services exports based on special surveys. The latter data at the firm level is not available to researchers.

Given the different sampling frames we impose a minimum firm size threshold of 10 employees to make the analysis more comparable across countries, i.e. we include firms with a median of at least 10 employees on average over the sample period. We exclude firms with zero sales and zero wages. This still means that we work with stratified samples up to 20 employees in Ireland, up to 30 employees in France and for small and medium-sized firms in Finland.

Table 1 gives the number of firms for 2004 for all sectors. For Slovenia introducing a lower bound on firm size is the most restrictive as the sample shrinks to only about 10 per cent of the total population of firms. As firms with less than 10 employees account for a large share of the overall number of service sector firms in all countries we will display results for this group whenever we show breakdowns by firm size, but the general analysis is done using firms with at least 10 employees.

**Table 1: Sectoral coverage (NACE Rev 1.1)**

	Finland 2002–2007		France 1999–2004		Ireland 2001–2007		Slovenia 2000–2008	
	Codes	%	Codes	%	Codes	%	Codes	%
Wholesale and retail trade	G50–52	40.7	..		G50–52	41.8	G50–52	44.3
Hotels, bars and restaurants	H55	7.9	H55	19.7	H55	*	H55	8.6
Transport, storage and communication	I60–64	15.0	I63–64	2.9	I60–64	7.1	I60–64	10.7
Real estate, renting and business activities	K70–74	32.1	K70–72, 74	68.8	K70–74	20.1	K70–74	31.6
Other community, social and personal service activities	O90–93	4.4	O90, 92–93	8.7	O92–93	31.0*	O92–93	4.8
Total firms		7,842		21,436		4,906		2,599

Notes: Number of firms and share in total number of firms are given for year 2004, includes only firms with a median of 10 or more employees over the sample period. \*Figure for sectors H and O combined.

Data on services trade for Ireland is only available from 2002. G50-52 Wholesale and retail trade; H55 Hotels and restaurants; I60 Land transport; transport via pipelines; I61 Water transport; I62 Air transport; I63 Supporting and auxiliary transport activities; activities of travel agencies; I64 Post and telecommunications; K70 Real estate activities; K71 Renting of machinery and equipment without operator and of personal and household goods; K72 Computer and related activities; K73 Research and development; K74 Other business activities; O90 Sewage and refuse disposal, sanitation and similar activities; O91 Activities of membership organization nec; O92 Recreational, cultural and sporting activities; O93 Other service activities.

Source: Indicated country sources.

#### 4. Stylized facts on services traders

In this section we present stylized facts on services firms that export and import goods and services. We first focus on trade participation and trade modes of services firms (Section 4.1). We then describe the characteristics of services firms that engage in trade by studying exporter and importer premia of trading firms across a set of firm characteristics (Section 4.2). In particular, we are interested in whether trade premia increase with firms' adding additional dimensions of trade. This together with a detailed analysis of the characteristics of firms that switch trading status allows us to gain insights into the cost of engaging in different dimensions of trade.

##### 4.1. Trade participation

Table 2 reveals that trade participation is much more common across manufacturing than for services firms. On average, trade participation of services firms ranges between 20 (in France though without sector G) and 64 per cent (in Slovenia) (with Ireland 33 per cent and Finland 42 per cent), while trade participation among manufacturing firms ranges between 72 and 87 per cent. There is a pattern indicating that services firms in small EU countries (Finland, Ireland, Slovenia) are more open to trade than their counterparts in a large country (France).

**Table 2: Trade participation of manufacturing and services firms, by countries and NACE Rev. 1.1, 2004 (in %)**

		no trade	exp only	imp only	exp&imp	no. of firms /share
Finland	all serv.	58.4	8.2	14.7	18.8	7,842
	G	41.2	3.4	24.5	30.8	40.7
	H	89.9	1.3	8.5	0.3	7.9
	I	62.6	18.1	9.3	10.0	15.0
	K	68.7	11.8	5.7	13.8	32.1
	O	69.9	4.1	18.4	7.6	4.4
	D (manuf.)	28.5	11.7	12.9	47.0	
France	all serv.	79.5	5.5	6.0	9.0	21,436
	G	-	-	-	-	-
	H	92.7	1.6	4.4	1.3	19.7
	I	71.0	4.3	10.5	14.2	2.9
	K	76.9	6.7	5.8	10.5	68.8
	O	73.3	4.9	8.9	12.8	8.7
	D (manuf.)	20.6	9.3	9.8	60.4	
Ireland	all serv.	67.1	3.5	16.0	13.4	4,906
	G	49.8	3.1	26.3	20.8	41.8
	I	39.2	41.6	0.0	0.0	7.1
	K	66.4	8.2	8.9	16.5	20.1
	HO	90.5	0.3	8.2	0.9	31.0
	D (manuf.)	19.9	6.5	19.7	53.9	
Slovenia	all serv.	35.5	11.1	11.4	42.0	2,599
	G	21.3	5.3	12.5	60.9	44.3
	H	69.6	8.9	14.7	6.7	8.6
	I	23.4	30.2	9.0	37.4	10.7
	K	48.9	14.1	7.9	29.0	31.6
	O	44.0	6.4	23.2	26.4	4.8
	D (manuf.)	13.0	7.5	6.3	73.2	

Note: Data include only firms with a median of 10 or more employees over the sample period.

Source: Indicated country sources; own calculations.

Among services firms, the lowest trade participation is in the hotels and restaurants sector (H; between 7 and 30 per cent only) and the highest in the wholesale and retail sale sector (G; between 50 and 79 per cent), followed by the transport sector (I; between 29 and 77 per cent). Since about 40 per cent of all services firms<sup>5</sup> are in the wholesale and retail trade sector most of the results for services firms related to trade participation are driven by firms in this particular sector. On the other hand, we have no data for sector G firms in France, and thus the overall French results are driven by sector K (69% of firms).

Most trading firms are engaged both in imports and exports. In three out of four countries, two-way traders represent the single largest group of traders. In Slovenia, the share of two-way traders among all services firms is equal to 42 per cent, it is lower in the other countries where it is bounded between 9 (France) and 19 per cent (Finland). At the same time, among one-way traders the share of firms that import only always

<sup>5</sup> Note that for France there are no data available for sector G.

exceeds the share of firms that export only. This indicates that services firms are more likely to be engaged in imports than in exports.

**Table 3: Type of trade participation of services firms, by countries, period average (in %)**

Trading status	Product type	Finland 03-07	France 99-04	Ireland 02-07	Slovenia 00-08
<b>exporters</b>					
exp only	export only goods	25.0	21.8	9.4	4.5
	export only services	2.1	13.9	9.6	14.5
	export both	2.1	2.4	1.4	2.4
exp&imp	export only goods	51.5	30.8	54.9	43.0
	export only services	4.5	15.3	18.4	14.3
	export both	14.8	15.8	6.4	21.3
		100.0	100.0	100.0	100.0
<b>importers</b>					
imp only	import only goods	39.7	28.9	47.2	22.4
	import only services	2.2	8.4	3.3	n.a.
	import both	1.6	2.4	6.4	n.a.
exp&imp	import only goods	39.5	32.6	29.7	76.5
	import only services	7.2	12.3	6.8	n.a.
	import both	9.8	15.5	6.7	n.a.
		100.0	100.0	100.0	100.0

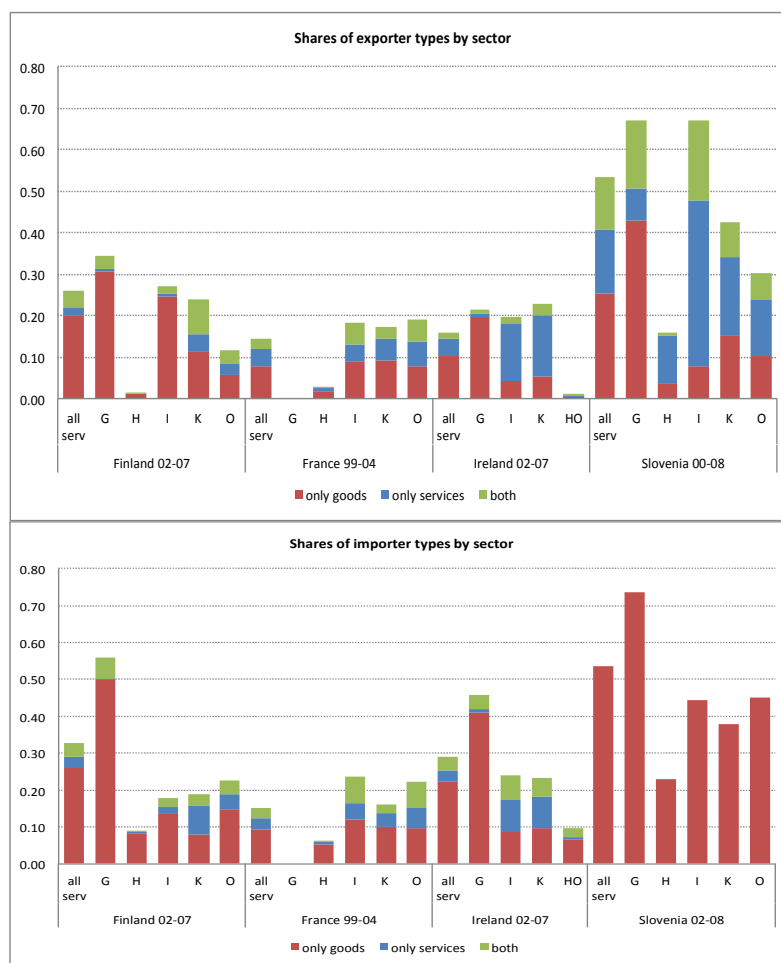
Source: Indicated country sources; own calculations.

Services firms are engaged in many dimensions of trade as they can serve as traders (exporters and importers) of both goods and services. Table 3 shows, however, that services firms are mainly engaged in the trade of goods, while trade in services is rather rare. Among exporters, the share of pure services exporters is between 2 and 14 per cent only. Among importers this share is even lower, between 2 and 8 per cent of all importers (with no data for Slovenia). The largest group of traders are services firms that export and/or import goods only. The share of goods-only traders varies between 47 (Slovenia) and 76 per cent (Finland) among exporters and between 61 (France) and 80 per cent (Finland) among importers. Firms that engage both in services and goods trade are rare – among exporters this share ranges from 8 to 24 per cent, among importers it varies between 11 and 18 per cent.<sup>6</sup>

A breakdown of services firms engaged in trade by sector (see Figure 1) reveals that among exporters the highest reliance on exports of goods only is among the wholesale and retail firms (G). With the exception of Finland, firms in transport and communication (I) and business services (K) are proportionally more engaged in exports of services only or both goods and services. Among importers, the structure of imports by type of product is quite similar to exporters. In the wholesale and retail trade sector imports are dominated by imports of goods only, while in transport and communication (I) and in business services (K) imports of services only are relatively more pronounced.

<sup>6</sup> Note that for Slovenia there is no information available on firm-level imports of services.

Figure 1: Type of trade participation of services firms, by countries and sectors, period average (in %)



Source: Indicated country sources; own calculations.

A breakdown of different types of trade of services firms by firm size classes shows another important feature of trade patterns. Trade in different types of products is clearly increasing in firm size (see Figure A1 in Appendix). Micro and small firms are predominantly engaged in exports (or imports) of goods only. As firm size increases firms gradually add services to their trade portfolios. For the largest size group (i.e. firms with 250 or more employees), the share of firms trading services only or both goods and services is over 60 per cent of all firms that are engaged in trade. This indicates that only larger firms can afford to diversify their trade across activities, which may be related to fixed costs incurred with any of the trade dimensions.

The stylised facts presented so far indicate several important features of services firms that engage in trade. First, services firms are relatively less engaged in trade than manufacturing firms. Second, services firms are more likely to be engaged in imports than exports and the prevalent type of trade is imports of goods only. Third, trade in services is quite rare; services are more likely to be traded by firms already engaged in goods trade. And fourth, trade diversification of services firms by types of “products” traded (goods, services) is increasing in firm size.

These stylized facts imply that, similar to manufacturing firms, for services firms trade is associated with significant fixed cost of engaging in trade and the cost of importing may be lower than the cost of exporting. At the same time, the cost of trading services may be larger than the cost of trading goods. In the next section we examine these implications in more detail and study the transitions of firms from one to more dimensions of trade participation.

## 4.2. Trade premia

To study the differences in performance between traders and non-traders among services firms we compute trade premia, defined as the ceteris paribus percentage difference in a particular performance indicator between traders and non-traders. We compute the premia using four common performance indicators – firm size (employment), average wages, labour productivity and total factor productivity (TFP).<sup>7</sup> The trader premia are computed from a regression of log performance indicators on the contemporaneous trading status dummy (export, import, both) and a set of control variables:

$$\ln Y_{it} = \alpha + \beta \text{Status}_{it} + \gamma \text{Control}_{it} + \mu_I + \mu_t + \epsilon_{it}, \quad (1)$$

where  $Y$  is a particular performance indicator (employment, average wages, labour productivity and TFP). *Status* is defined as a dummy variable taking value 1 if the firm exports only, imports only or both exports and imports, hence firms that do not trade are the omitted category. *Control* variables include firm size (in terms of employment), size squared (to account for non-linearities)<sup>8</sup>, log wages to proxy human capital, a dummy for foreign ownership (except for France), NACE 3-digit industry and year dummies.

We estimate (1) by OLS first. To account for unobserved firm heterogeneity due to time-invariant firm characteristics which may be correlated with the variables included in the model and which may lead to a biased estimate of the trader premia, model (1) is also estimated using fixed-effects regressions. The coefficients from the OLS regressions can be interpreted as conditional differences in size, wages and productivity of traders compared to the reference group, that is the industry-year averages of domestic non-traders. The fixed-effects regressions in turn estimate a correlation between a change in trading status and a change of the dependent variable as this type of regression captures firms' deviations from their own long-term averages. If time-invariant firm characteristics are correlated with trading status or the probability of switching is higher due to a contemporaneous shock, differences between the two estimation methods may emerge. It is important to note that fixed-effects regressions identify only

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<sup>7</sup> Note that TFP for services firms is a cumbersome measure as material costs provide a less important input into services production, while on the other hand physical productivity cannot be observed. We compute the TFP measure as a residual from a sector-specific OLS regression of log sales on log employment and log labour and a set of year and NACE 3-digit industry dummy variables as well as 2-digit industry year interaction terms.

<sup>8</sup> Obviously not when size is the dependent variable.

firms that change trading statuses (however, these are few – see transition matrices in the next section).

The trader premia, computed from the estimated coefficient  $\beta$  as  $100*(\exp(\beta)-1)$ , show the average percentage difference in performance between traders and non-traders controlling for the characteristics included in the vector *Control*. Below we present results with regard to trading status and to the type of products traded.

#### 4.2.1. Results for differences in trading status

Results for trader premia for all four performance indicators are summarised in Figure 3. OLS results indicate that trading firms earn significant positive premia in all respects – they are larger, pay higher wages and have higher productivity than non-trading firms. Firms that both export and import outperform one-way traders on all accounts. Trader premia are largest for firm size, where two-way traders are shown to be up to three times bigger than non-traders. Firms that export only are 40 to 50 per cent larger than non-traders. For firms that import only the figures are 40 to 90 per cent. In terms of wages and productivity trade premia are smaller, but still in the range 10-30 per cent for one-way traders and in the range 20-90 per cent for two-way traders. In terms of productivity, Ireland is an exception with extremely low trade premia recorded – bounded between 1 and 10 per cent only. Results also show that, with the exception of Finland, firms that export only have higher productivity (labour productivity and TFP) than firms that import only, indicating a lower fixed cost of importing than exporting.

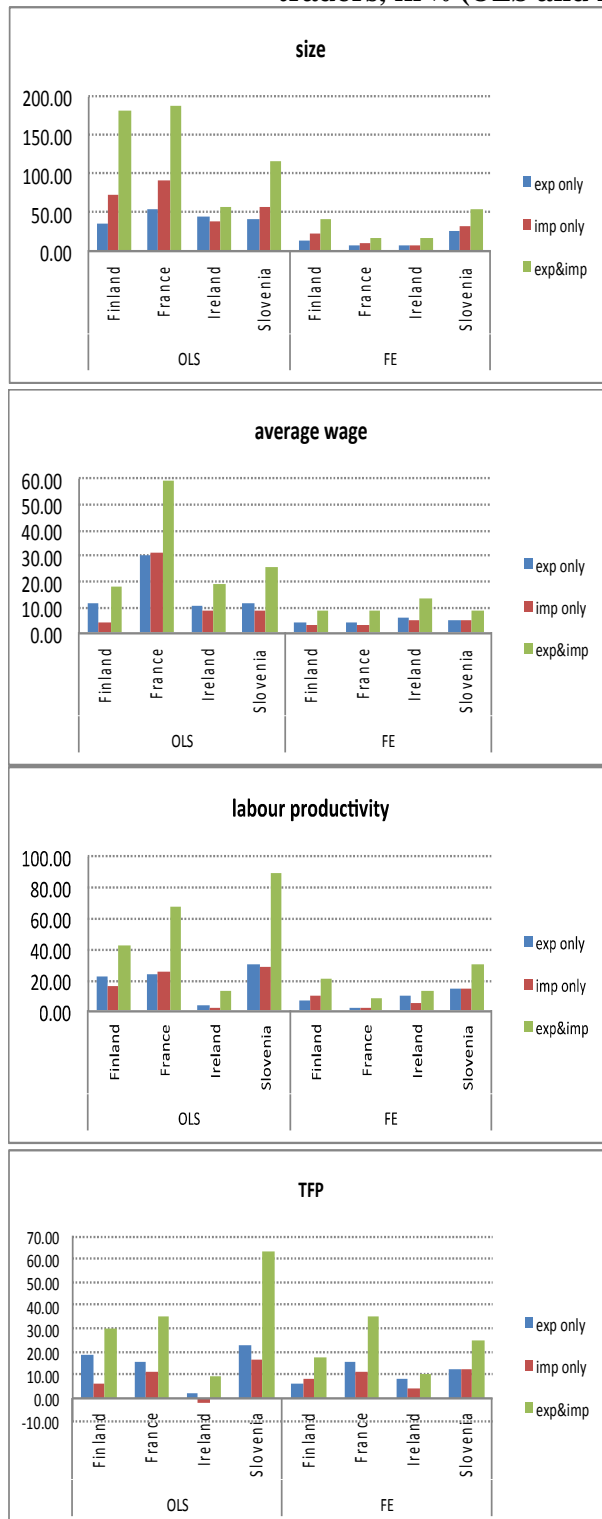
The results from the fixed-effects estimations of trade premia are similar to the OLS results, but they tend to be lower by a factor 2-3 in Finland and Slovenia and by a factor 6-8 in France.<sup>9</sup> As mentioned above, this is to be expected as fixed effects estimations account for the effect of changes in trading status. Nevertheless, the fixed effects regressions show that all groups of traders benefit from changing to a new trading status and that the effect is largest for two-way traders. Again, with the exception of Finland, firms that export only have higher wage and productivity premia than firms that import only.

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<sup>9</sup> For Ireland, the labour productivity and TFP premia obtained by fixed-effects regressions are shown to be higher than those obtained by OLS.



**Figure 2: Trading services firms' size, wage and productivity premia relative to non-traders, in % (OLS and fixed effects regressions)**

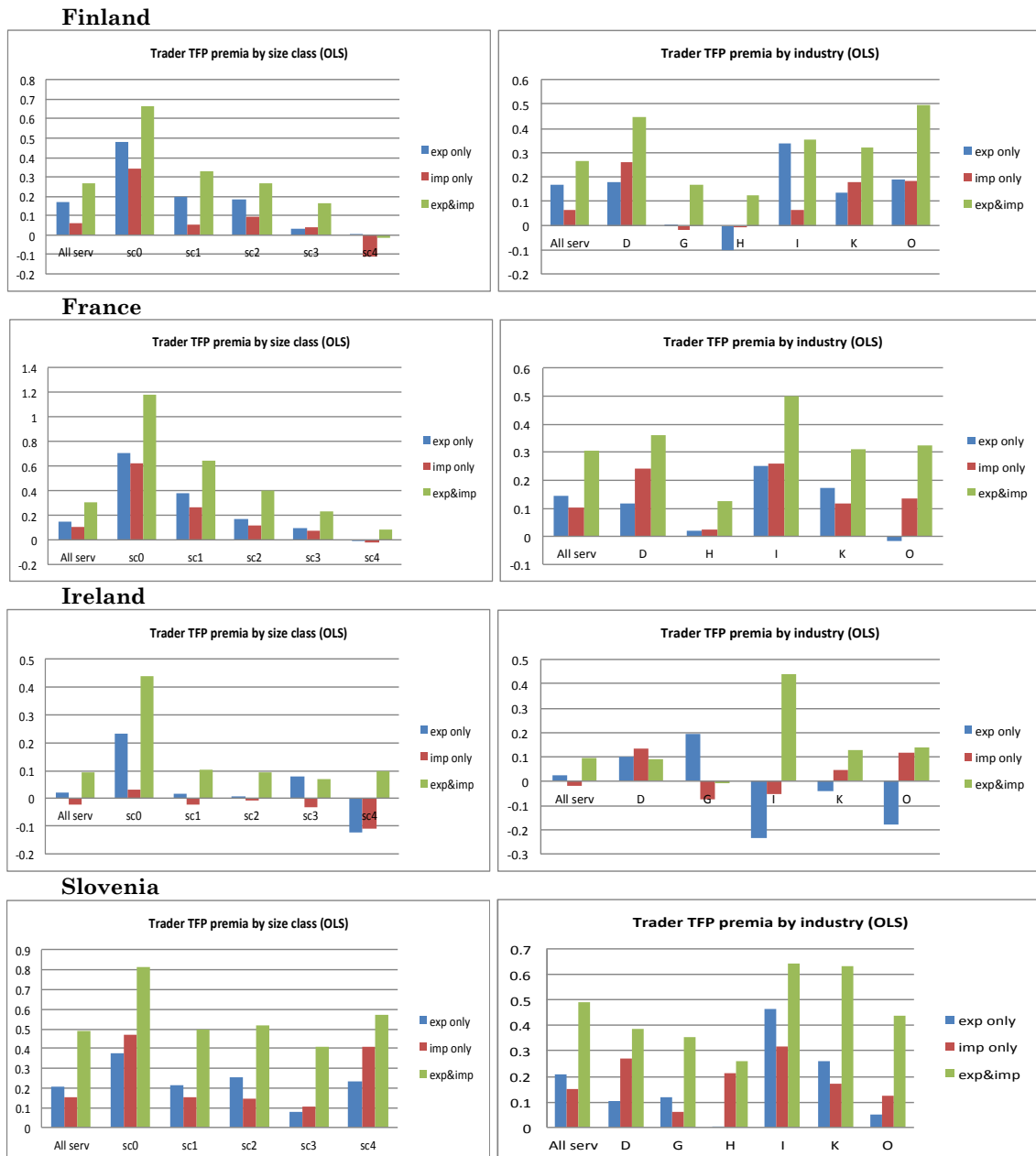


Notes: Standardised beta coefficients (in %) from estimating model (1). All coefficients significant at 10 per cent or better. Full results are in Table A1 in the Appendix.

Source: Indicated country sources; own calculations.

We also computed trade premia by sector and size class. In Figure 3 we present the OLS results for TFP only, the results for the other performance indicators are in the Appendix (Table A1). Productivity premia are decreasing in firm size. Micro firms (with less than 10 employees) earn the largest TFP premia from trade. The productivity premia then decrease monotonically with size. The only exception is Slovenia where TFP premia pick up again in the group of the largest firms (with 250 or more employees). Interestingly, in Ireland substantial TFP premia of traders are earned by micro firms only, whereas the premia are very low (below 10 per cent) or even negative and mostly insignificant for all other size classes. In turn, in terms of TFP premia the aggregate ranking of traders is largely preserved in all size classes, i.e. two-way traders are most productive, followed by exporters only and importers only.

**Figure 3: TFP premia of services firms, by size class and industry (OLS regressions)**



Notes: Standardised beta coefficients from estimating model (1). All coefficients significant at 10 per cent or better. Full results can be obtained from authors upon request. Size classes: sc0: 0-9, sc1: 10-19, sc3: 20-49, sc4: 50-249, sc5: 250+ employees.

Source: Indicated country sources; own calculations.

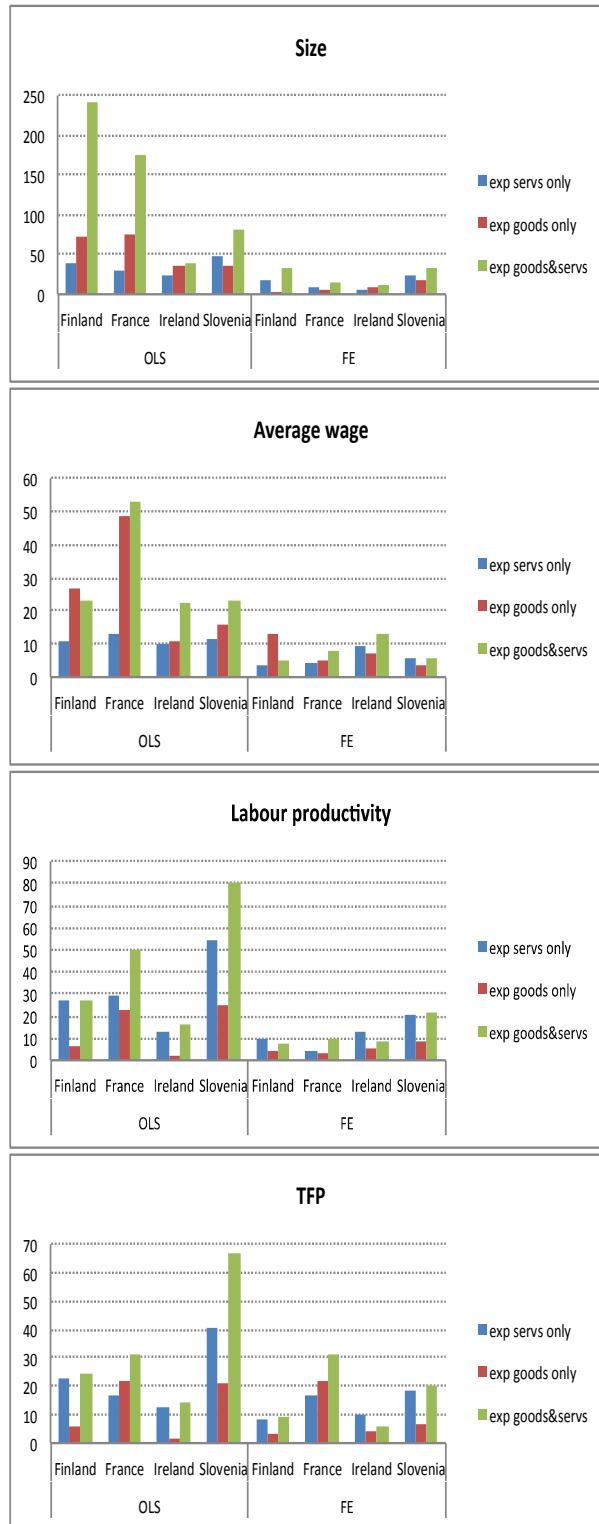
Firms in sector I (transport and communications) earn the largest TFP premia, followed by sector K (real estate, renting and business activities) and sector O (other business services). In the retail and wholesale sector (G) and in hotels and restaurants (H), the

TFP premia are comparatively low – up to 20 per cent only for the group of two-way traders. Again, the aggregate ranking of traders is preserved in all sectors.

#### **4.2.2. Results for differences in type of traded products**

In the previous section we found that services firms mainly engage in trade of goods, while trade in services or both in services and goods is rather rare. This structure of trade by type of product is driven by the trade premia of trading services firms. In what follows, we report trade premia by type of traded product separately for importers and exporters.

**Figure 4: Exporters' size, wage and productivity premia relative to non-exporters in % (OLS and fixed effects regressions)**

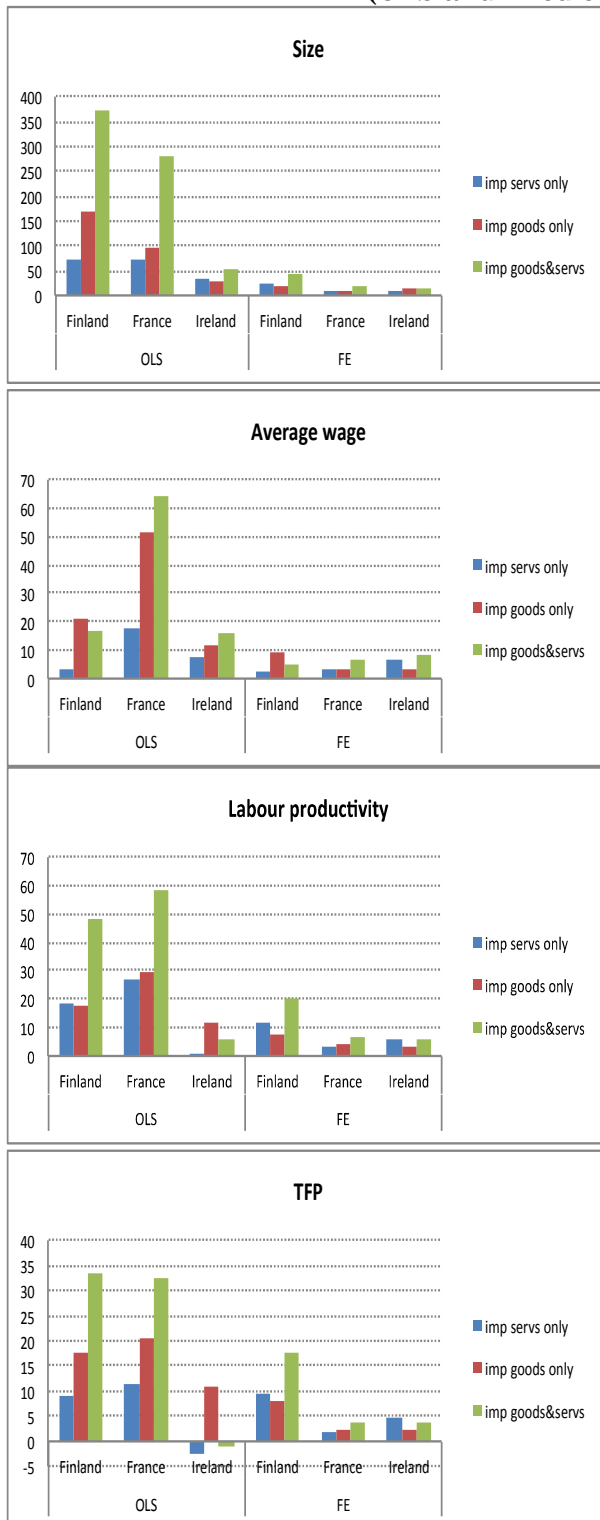


Notes: Standardised beta coefficients from estimating model (1). All coefficients significant at 10 per cent or better. Full results are in Table A2 in the Appendix.

Source: Indicated country sources; own calculations.

Results for trade premia of exporters presented in Figure 4 clearly show that service sector firms that export both goods and services are the largest firms, pay the highest wages and have the highest productivity. Firms that export services only are smaller and pay lower wages than firms that export goods only, but have higher productivity (the only exception being France with the TFP measure). This indicates that exporting services is associated with higher fixed cost than exporting goods, which enables low productivity services firms to export goods but not services. Results from fixed-effects regressions suggest some significant gains from switching to a new trading status – in the range of 10-20 per cent or even 30 per cent in France. The highest gains are obtained when starting to export services only or adding services exports in firms that are already exporting goods.

**Figure 5: Importers' size, wage and productivity premia relative to non-importers in % (OLS and fixed effects regressions)**



Notes: Standardised beta coefficients from estimating model (1). All coefficients significant at 10 per cent or better. Full results are in Table A3 in the Appendix.

Source: Indicated country sources; own calculations.

We also performed estimations of export premia of services firms across size classes and industries. Results across industries show that size, wage and productivity premia relative to non-traders are largest for the group of firms with less than 10 employees in all countries. Results by industries, however, show that differences in size, wage and productivity premia across sectors are country-specific. Broadly speaking, firms in sectors I (Transport), K (Real estate, renting and business activities) and O (Other community, social and personal service activities) tend to earn the largest productivity premia, while in Finland and Slovenia also sectors G (wholesale and retail trade) and H (Hotels, bars and restaurants) obtain high productivity premia. The overall ranking of premia by type of exported products is preserved both across size classes and industries.<sup>10</sup>

The results for trade premia of importers presented in Figure 5 in general resemble the results obtained for exporters, but with two notable departures. First, while both exporters and importers that trade both goods and services have the highest size, wages and productivity premia, firms that import goods only, obtain higher premia than firms that import services only. This may indicate that importing goods could be associated with a higher fixed cost than importing services. And second, the fixed-effects results suggest that for importers switching to a new trading status brings very little gains – only between 2 and 5 per cent for France and Ireland, and up to 10 per cent for Finland. Note that gains from switching trade for exporters are notably higher (by up to 5-times).

## **5. Transition and performance of firms switching trading status**

The stylised facts presented in the previous section indicate several important features of services firms that engage in trade. First, similar to manufacturing firms, trade for services firms is associated with a significant fixed cost of engaging in trade, where the cost of importing appears to be lower than the cost of exporting. Second, trading services is associated with a higher fixed cost than trading goods, which enables low productivity services firms to engage in the trade of goods but not of services. Third, trade diversification of services firms by type of product traded (goods or services) is increasing in firm size. This implies that only large and/or high-productivity firms trade both goods and services. And fourth, results from fixed-effects regressions suggest significant gains from switching to a new trading status. Here, the productivity premia for starting to export services and from switching from exporting goods only to also exporting services are higher than for the same transitions among importers.

This section studies the transition and switching gains in more detail. We study both switching trading status (Section 5.1.) and switching between trading goods and services (Section 5.2.). For this purpose, we first present the transition matrices and then proceed with the econometric analysis of the pre-switching premia and post-switching gains.

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<sup>10</sup> Detailed results can be obtained from authors upon request.



## 5.1. Gains from switching trading statuses

### 5.1.1. Transition between trade statuses

**Table 4: Transition matrices for changes between trading statuses, year-on-year average over period (in %)**

	no trade	exp only	imp only	exp&imp
Finland 02-07				
no trade	90.9	4.2	4.0	0.9
exp only	22.7	60.0	2.3	15.0
imp only	14.8	1.4	71.2	12.6
exp&imp	2.3	5.0	8.4	84.2
France 99-04				
no trade	93.7	2.8	2.7	0.8
exp only	38.6	39.8	5.8	15.8
imp only	35.6	5.7	43.7	15.0
exp&imp	5.8	8.9	9.7	75.6
Ireland 01-07				
no trade	96.4	0.5	2.5	0.6
exp only	10.9	79.1	0.7	9.2
imp only	6.5	0.0	89.7	3.8
exp&imp	3.3	1.7	3.5	91.5
Slovenia 00-08				
no trade	83.7	6.3	7.3	2.7
exp only	17.1	59.6	3.4	20.0
imp only	20.5	3.1	55.0	21.5
exp&imp	1.3	6.1	5.7	86.9

Source: Indicated country sources; own calculations.

As is evident from the analysis of trade premia, also in the services sectors trading firms outperform non-traders, and in addition firms that switch trading status gain additional premia. Table 4 shows that trading status of services firms is highly persistent for all four countries. Trade persistence is highest for firms that do not trade (as high as 84 to 96 per cent of all firms) and firms that both export and import (between 76 and 92 per cent). Switchers are quite rare: there are only very few trade starters (only 3 to 14 per cent of all firms), but more trade stoppers (up to 40 per cent). The highest tendency to stop trading is recorded for firms that export only (between 7 and 36 per cent), followed by firms that import only (between 11 and 39 per cent). On the other hand, firms that engage in two-way trade only rarely decide to stop trading (only between 1 and 6 per cent of all firms).<sup>11</sup> The highest drop-out rates are recorded in France (up to 39 per cent)

<sup>11</sup> For Irish manufacturing firms Table 7 in Haller (2012) shows that once firms are engaged in at least one dimension of trade, they are more likely to exit the market than to reduce the number of dimensions they trade in. Since with the exception of Slovenia our data sets cover the population of firms only above a certain size threshold, we are unable to examine firm exit with the data sets at hand.

and the lowest in Ireland (up to 11 per cent). Transition rates from one-way trading to two-way trading are comparatively high. The highest transition rates from one-way to two-way trading are observed in Slovenia (up to 22 per cent) and the lowest in Ireland (less than 4 per cent among importers and 9 per cent among exporters).

### 5.1.2. Switching premia

We study the gains from switching trading status by amending the now standard econometric analysis of the *ex ante* (pre-switching) premia and *ex post* (post-switching) gains. By doing this, we test the empirical validity of the two competing hypotheses in the exporter literature (see Wagner, 2007 for a survey of literature). The self-selection hypothesis assumes that the more productive firms will self-select into a certain trading status (no trade, export only, import only, export and import). In this case the pre-switching differences in firm performance measures between trade starters (switchers) and non-traders should be significant several years before the switch. We can also check which trading status is associated with the largest pre-switching premium. A competing, learning-from-trade hypothesis assumes that switchers gain significant *ex post* premia from switching, i.e. differences in firm performance measures between switchers and non-switchers become significant only after the former switched trading status. Again, we can investigate which trading status is associated with the largest post-switching premium. Given the complexity of potential modes of trade engagement, this approach provides an important novelty in the literature on trade in services.<sup>12</sup>

To test whether today's switchers were bigger, more productive and paid higher wages than today's non-switchers several years back when all of them shared the same status, we estimate the average difference in performance measure in years  $t-2$  and  $t-1$  between firms that did not change their trading status and those firms that did. Similarly, for the learning hypotheses we estimate the average difference in ex-post performance measure in years  $t+1$  and  $t+2$  between switchers and non-switchers. Year  $t$  indicates the year when the switch occurs. Given the limited time dimension of our data sets the, analysis is restricted to a five-year period.

We estimate the following empirical model for each cohort of trade switchers and non-switchers:

$$\ln Y_{it} = \alpha + \sum_{s=t-2}^{t+2} \beta \text{Switch}_{is} + \gamma \text{Control}_{it} + \mu_i + \mu_t + \epsilon_{it} \quad (2)$$

where  $Y$  is a particular performance indicator (employment, average wages, labour productivity, TFP and export or import value). *Switch* is defined as a dummy variable taking value 1 if a firm changes trading status in one of the following ways: (i) from no

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<sup>12</sup> A similar approach is used in Haller (2012) for transitions of Irish manufacturing firms between exporting, importing and intra-firm trade.

trade to exporting only, (ii) from no trade to importing only, (iii) from no trade to exporting and importing, (iv) from exporting only to both exporting and importing, (v) from importing only to both exporting and importing, and 0 otherwise. *Control* is a vector of control variables that include the logarithms of firm size (in terms of employment) and wages to proxy human capital, as well as a dummy for foreign ownership (except for France), year, NACE 3-digit industry and 2-digit industry-year interaction dummies.

The model is estimated using OLS. The pre-switching and post-switching premia show the average percentage differences between a particular cohort of today's switchers and the reference group in the period between  $t-2$  and  $t+2$  years before (after) the switch, controlling for the characteristics included in the vector *Control*. The corresponding reference group is always a cohort of firms with the same initial trading status, i.e. they did not change trading status. We require that firms in the switcher group and the non-switcher control group are observed in all five years.

Performing these econometric estimations limits the available number of observations. As shown in Table A4 in the Appendix, the number of firms that switch trading status is rather small in all countries – 118 firms in Ireland, 137 firms in France, 158 firms in Slovenia and 211 firms in Finland. This may significantly affect the efficiency of the econometric estimations and increase the standard errors of the estimated coefficients.

Results for switching premia in terms of labour productivity are reported in Table 5.<sup>13</sup> The results show some interesting regularities. Firms in France and Slovenia that switch from no trade to exporting only benefit from the switch in terms of increased labour productivity from the year of the switch onwards, where the premium trends upwards. In Finland the opposite effect is recorded, with a significant premium before the switch and the size of the premium decreasing afterwards. In Ireland the coefficients are small and positive but not significant.

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<sup>13</sup> For other firm performance measures the results are in Table A5 in the Appendix.

**Table 5: Productivity premia from switching trading status**

<b>No trade to exporting only</b>							
	Finland		France		Ireland		Slovenia
t-2	0.203	*	0.064		0.036		0.047
t-1	0.236	**	0.132		0.087		0.126
t	0.189	*	0.232	*	0.001		0.251 +
t+1	0.179	*	0.272	*	0.053		0.318 *
t+2	0.135		0.294	*	0.051		0.375 **
Adj. R-sq	0.68		0.73		0.83		0.45
Obs.	18,273		39,442		6,344		3,965
Firms	3,137		6,852		1,043		553
Switchers	52		41		6		43
<b>No trade to importing only</b>							
t-2	0.144		0.072		0.015		0.136
t-1	0.189	*	0.140	+	0.014		0.069
t	0.205	*	0.146	*	-0.028		0.142
t+1	0.216	**	0.214	*	-0.038		0.070
t+2	0.229	**	0.194	*	-0.033		0.126
Adj. R-sq	0.68		0.73		0.83		0.43
Obs.	18,348		39,372		6,599		3,849
Firms	3,152		6,838		1,094		534
Switchers	67		29		57		22
<b>No trade to exporting and importing</b>							
t-2	0.203		0.382	+	0.470	**	0.499 *
t-1	0.430	**	0.045		0.487	**	0.635 **
t	0.294	*	0.274	*	0.467	**	1.049 **
t+1	0.283	**	0.313	**	0.515	**	1.090 **
t+2	0.198	*	0.173		0.530	**	1.226 **
Adj. R-sq	0.68		0.73		0.83		0.45
Obs.	18,073		39,282		6,374		3,807
Firms	3,097		6,820		1,049		525
Switchers	12		10		12		13
<b>Exporting only to exporting and importing</b>							
t-2	0.381	+	0.356	+	-0.018		0.182
t-1	0.407	*	0.364	+	-0.055		0.209
t	0.386	+	0.314	+	-0.093		0.264 +
t+1	0.392	+	0.217		-0.122		0.310 +
t+2	0.339	+	0.309		-0.083		0.329 *
Adj. R-sq	0.53		0.65		0.79		0.45
Obs.	761		455		321		796
Firms	144		85		58		133
Switchers	24		19		17		20

<b>Importing only to exporting and importing</b>						
t-2	0.079		0.385 *	-0.061	0.631 **	
t-1	0.069		0.359 *	-0.082	0.666 **	
t	0.117		0.333 *	-0.006	0.667 **	
t+1	0.201 *		0.354 *	-0.057	0.712 **	
t+2	0.211 *		0.248	-0.079	0.730 **	
Adj. R-sq	0.50		0.61	0.78	0.47	
Obs.	2,801		798	2,045	762	
Firms	498		145	338	133	
Switchers	56		38	26	60	

Notes: Coefficients from OLS regression with labour productivity as a dependent variable according to model (2). Switch in period  $t$ . Regressions control for firm size, foreign ownership (except for France), average wages, 3-digit industry, year and 2-digit industry-year interaction dummies. Full results are in Table A5 in Appendix. \*\*, \* and + denote significance at 1, 5 and 10 per cent.

Switching from no trade to importing only increasingly benefitted firms in Finland and France only. Switching from no trade to both exporting and importing increasingly benefitted firms in Ireland and Slovenia. In the other two countries the results are mixed, with significant positive but decreasing premia after the switch. Switching from exporting only to two-way trade has a positive productivity effect in Slovenia, while in Finland and France the premia are positive and significant before the switch, but decrease or disappearing after the switch. Similarly, the switch from importing only to two-way trade is associated with positive and increasing premia among Slovenian firms and Finnish firms after the switch, while in France the positive pre-switch premia are reduced after the switch.

To summarize the findings, the only systematic productivity gains from switching trading status are recorded in Slovenia (in 4 out of 5 trade switching episodes), where in 2 episodes the gains occurred after the switch and in 2 episodes the premia after the switch were strengthened. In France, positive productivity gains from switching are recorded in 2 out of 5 trade switching episodes, while in 2 episodes the pre-switch premia were reduced or disappeared completely after the switch. In Finland, for 4 out of 5 transitions the productivity premia were significantly positive already before the switch, but were then reduced in 3 episodes after the switch. Only for one episode (from importing only to exporting and importing) there is an increasing trend after the switch. In Ireland, there is only one trade switching episode (from no trade to both exporting and importing) where significant productivity premia of switchers are recorded. Based on these findings, we can conclude that similarly to the findings on manufacturing firms there is a prevalent self-selection effect of services firms into different trading status, while learning effects are, with the exception of Slovenia, rare.

Another interesting feature arising from the results is the ranking order of the estimates of the productivity premia associated with switching. The highest productivity premia are recorded for firms switching from no trade to both exporting and importing,

followed by the switch from importing only to both importing and exporting and by the switch from exporting only to both importing and exporting. This suggests that starting to trade requires higher productivity and that adding more dimensions of trade requires correspondingly higher productivity. In addition, for an average firm it is relatively easier to become a two-way trader if it was engaged in importing rather than in exporting.

## **5.2. Gains from switching between trading goods and services**

The gains from switching trading status can also be related to the type of product traded since we observed earlier that firms that are engaged in trading both goods and services earn larger premia than firms engaged in trading only one type of product. Adding another type of product (i.e. goods or services) to the existing set of traded products may require higher pre-switching productivity premia and/or result in a higher post-switching premia. To account for this, we study in this sub-section the dynamic gains from firms adding a new type of product to their set of traded products. We first study the exporters and then proceed with the importers.

### **5.2.1. Transitions between trading goods and services**

Table 6 shows the transition matrices for switching between trading goods and services for exporters. Export status of services firms is highly persistent in all four countries. Persistence is highest for firms that never export (between 87 and 98 per cent of all non-exporters never decide to start exporting) and for firms that export goods only (between 60 and 84 per cent). There are high drop-out rates for firms that export services only and firms that export goods only, the former are higher than the latter. This indicates higher uncertainty in exporting services than goods. There is also a significant share of firms that switch from exporting goods only or services only to exporting both. The frequencies seem to be higher for firms switching from exporting services only than from exporting goods only. This again is indicative of a higher fixed cost of exporting services than exporting goods.

The overall pattern of switching between goods and services trade is very similar for importing (see Table 7). Importers of goods only are more persistent in their status than importers of services only, while switching from importing services only to importing both goods and services is systematically more frequent than from importing goods only. These switching trends in imports suggest similar conclusions as in exports, namely that switching from trade in services to trade in goods is easier than vice versa.

**Table 6: Transition matrices for changes between types of exporting – year-on-year average over period**

	no exp	exp goods	exp servs	exp goods&servs
<b>Finland 02-07</b>				
no exp	93.1	6.0	0.7	0.2
exp goods	16.3	79.9	0.5	3.3
exp servs	25.1	5.4	45.5	24.1
exp goods&servs	3.7	10.1	9.5	76.7
<b>France 99-04</b>				
no exp	95.2	2.7	1.9	0.3
exp goods	29.8	60.2	2.2	7.9
exp servs	32.9	3.6	53.1	10.4
exp goods&servs	7.0	18.4	16.4	58.3
<b>Ireland 02-07</b>				
no exp	98.3	1.1	0.5	0.1
exp goods	9.4	83.9	4.7	2.1
exp servs	9.2	9.2	78.5	3.1
exp goods&servs	6.5	18.4	13.1	62.0

Source: Indicated country sources; own calculations.

**Table 7: Transition matrices for changes between types of importing – year-on-year average over period**

	no imp	imp goods	imp servs	imp goods&servs
<b>Finland 02-07</b>				
no imp	93.8	4.9	1.1	0.1
imp goods	11.3	85.7	0.2	2.7
imp servs	21.3	1.8	68.7	8.3
imp goods&servs	2.0	15.1	8.6	74.2
<b>France 99-04</b>				
no imp	95.3	3.17	1.33	0.22
imp goods	28.7	63.35	2.00	5.95
imp servs	32.2	5.86	49.35	12.57
imp goods&servs	6.2	19.89	15.00	58.93
<b>Ireland 02-07</b>				
no imp	96.22	2.67	0.68	0.44
imp goods	6.18	86.01	2.61	5.20
imp servs	10.60	15.81	65.42	8.18
imp goods&servs	7.27	24.09	5.79	62.84

Source: Indicated country sources; own calculations.

### 5.2.2. Switching premia

The findings arising from the switching trends between trade in goods and trade in services shown in the transition matrices suggest that both for exports and imports the fixed cost of engaging in services trade as well as the uncertainty associated with trading services are higher than in trading goods. Furthermore, this suggests that switching from no trade to trade in services should be associated with either higher pre-switching productivity premia and/or higher post-switching productivity gains than switching from no trade to trade in goods. Similarly, switching from trade in goods only to trade in goods and services is likely to be associated with higher pre- and post-entry productivity premia than switching from trade in services only to trading both.

We account for switching premia in terms of (labour) productivity by estimating a version of model (2). Due to a lack of data for trade in services, Slovenia is not included in this part of the analysis. Another problem is a rather small number of events for some of the switching episodes. Due to an insufficient number of observations, there are no results for Ireland for some estimations. Accordingly, the estimates of premia for switching to and between trade in goods and trade in services suffer from the problem of having a small number of observations and hence in somewhat unreliably estimated coefficients.

Results for switching to and between trade in goods and trade in services (see Tables 8 and 9) give very similar results for exporting and for importing. We find significant productivity premia of switching only for the episodes of switching from no trade to either trade in goods or trade in services or trade in both. The ranking of the estimated productivity premia is in line with the previous analysis: The highest premia are recorded for firms that switch from no trade to trade in services and for the switch from no trade to trade in goods.<sup>14</sup> In all of the episodes, the switching premia in terms of productivity existed already two years before the switch and remained rather constant over the whole 5-year period of analysis. In other words, firms deciding to start either importing or exporting were more productive than their peers already two years before the switch and remained so also after they started trading. The only difference among the trade starters is in the size of the required pre-entry premia – trading services is more costly than trading goods.

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<sup>14</sup> There are insufficient numbers of firms that start to trade both goods and services in all countries to obtain reliable estimates.



**Table 8: Productivity premia from switching between exporting goods and services**

<b>No exports to exporting goods only</b>					
	Finland		France		Ireland
t-2	0.118	*	0.163	*	-0.014
t-1	0.132	*	0.138		-0.035
t	0.116	*	0.132	*	0.006
t+1	0.113	*	0.127	+	-0.039
t+2	0.132	**	0.177	**	0.008
Adj. R-sq	0.66		0.71		0.82
Obs.	24,459		45,404		7,658
Firms	4,187		7,869		1,354
Switchers	114		63		20
<b>No exports to exporting services only</b>					
t-2	0.029		0.409	**	0.185
t-1	-0.001		0.476	**	0.026
t	0.023		0.434	**	0.030
t+1	0.004		0.398	**	0.148
t+2	-0.318		0.381	*	0.042
Adj. R-sq	0.66		0.71		0.82
Obs.	23,939		45,329		7,588
Firms	4,083		7,854		1,340
Switchers	10		48		6
<b>Exporting goods only to exporting goods and services</b>					
t-2	-0.117		0.106		
t-1	-0.054		0.109		
t	-0.080		0.186		
t+1	-0.154		0.103		
t+2	-0.190		-0.055		
Adj. R-sq	0.44		0.36		
Obs.	4,534		1,878		
Firms	801		338		
Switchers	26		25		
<b>Exporting services only to exporting goods and services</b>					
t-2			-0.170		
t-1			0.089		
t			0.166		
t+1			0.135		
t+2			0.394		
Adj. R-sq			0.38		
Obs.			739		
Firms			136		
Switchers			11		

Notes: Coefficients from OLS regression with labour productivity as a dependent variable according to equation (2). Switch in period  $t$ . Regressions also control also for firm size, foreign ownership (except in France), average wages and importer dummy, 3-digit industry, year and 2-digit industry-year interaction terms. \*\*, \* and + denote significance at 1, 5 and 10 per cent. Where cells for individual countries are left blank we have fewer than 5 switchers in the respective category. This is the case for all countries for a potential transition from not exporting to exporting goods and services.

**Table 9: Productivity premia from switching between importing goods and services**

<b>No imports to importing goods only</b>					
	Finland		France		Ireland
t-2	0.167		0.100		-0.060
t-1	0.230	**	0.148	+	-0.069
t	0.231	**	0.177	+	-0.116
t+1	0.232	**	0.118		-0.131 +
t+2	0.251	**	0.199	**	-0.147 +
Adj. R-sq	0.64		0.71		0.82
Obs.	22,072		44,701		5,681
Firms	3,786		7,746		1,011
Switchers	105		43		38
<b>No imports to importing services only</b>					
t-2	0.401	*	0.358	*	
t-1	0.471	**	0.355	**	
t	0.388	**	0.318	*	
t+1	0.326	*	0.349	**	
t+2	0.290	*	0.374	**	
Adj. R-sq	0.65		0.71		
Obs.	21,637		44,526		
Firms	3,699		7,711		
Switchers	18		12		
<b>Importing goods only to importing goods and services</b>					
t-2	-0.085		0.134		-0.109
t-1	-0.031		0.201		-0.121
t	0.026		0.242		-0.128
t+1	0.063		0.311	*	-0.196
t+2	0.057		0.320	*	-0.172
Adj. R-sq	0.47		0.46		0.71
Obs.	7,341		2,511		2,056
Firms	1,268		445		369
Switchers	27		8		11

Notes: Coefficients from OLS regression with labour productivity as a dependent variable according to equation (2). Switch in period  $t$ . Regressions also control also for firm size, foreign ownership (except for France), average wages, an exporter dummy, 3-digit industry, year and 2-digit industry-year interaction dummies. \*\*, \* and + denote significance at 1, 5 and 10 per cent. There are insufficient observations to obtain reliable estimates for transition from not importing to importing both goods and services for all countries. Where cells for individual countries are left blank we have fewer than 5 switchers in the respective category. This is the case for all countries for a potential transition from importing services only to importing goods and services.

The above implies no learning effects in terms of productivity gains from switching between trading goods and services. This fact is corroborated with the results for the episodes where a firm that already traded goods (or services) later added also trade in services (goods). The coefficients for productivity premia before or after these switches are significantly different from zero only for adding services imports to already importing goods in France after the switch. However, as mentioned before, this lack of

evidence may well be attributable to the problem of a small number of observations and consequently somewhat unreliably estimated coefficients.

## **6. Discussion and conclusions**

In this paper we study common stylized facts on services firms engaged in trade by the means of a comparative study across four EU member countries. We present a number of stylized facts on services firms that trade. We find that services firms are relatively less engaged in trade than manufacturing firms. Similar to manufacturing firms, services firms that engage in trade are larger, pay higher wages and have higher productivity than firms that do not trade. Services firms are more likely to be engaged in imports than exports, and the prevalent type of trade is trade in goods only. The complexity of trading activities is increasing in firm size and productivity. Two-way traders always outperform one-way traders. We also find that trade in services is quite rare; services are more likely to be traded by firms already engaged in goods trade. In addition, changes in trading status by either adding another dimension of trade (imports, exports) or another type of product traded (goods, services) are infrequent and are associated with significant pre-switching premia. Learning effects from switching trading status are uncommon.

These findings suggest that, similar to manufacturing firms, trade by services firms is associated with significant fixed costs of engaging in trade with the costs of importing being lower than costs of exporting. Consequently, importing is a prevalent trade mode. The costs of trading services are larger than the costs of trading goods. Only the largest and most productive firms can afford to engage in imports and exports of both goods and services.

Trade policy is traditionally aimed at boosting exports or at facilitating export market entry for new exporters. The prevalence of importers (many of which go on to become exporters) in this study and in earlier work for manufacturing suggests that assisting firms in finding suppliers abroad – if required – may be equally if not more important. However, our analysis also suggests that there is a considerable amount of short-lived entry and exit from import and export markets, thus it is not clear that a perceived lack of exporters or importers in an economy can be viewed as a market failure, which would justify government intervention. There seem to be higher barriers to trading services than to trading goods, and based on anecdotal evidence trade in services frequently accompanies trade in goods. Also here, there is no clear evidence that traders of goods or services need government assistance in order to enter international markets or to expand their operations abroad. Harmonising international regulation and reducing entry barriers would appear as the most promising measures to stimulate trade in services by services firms.

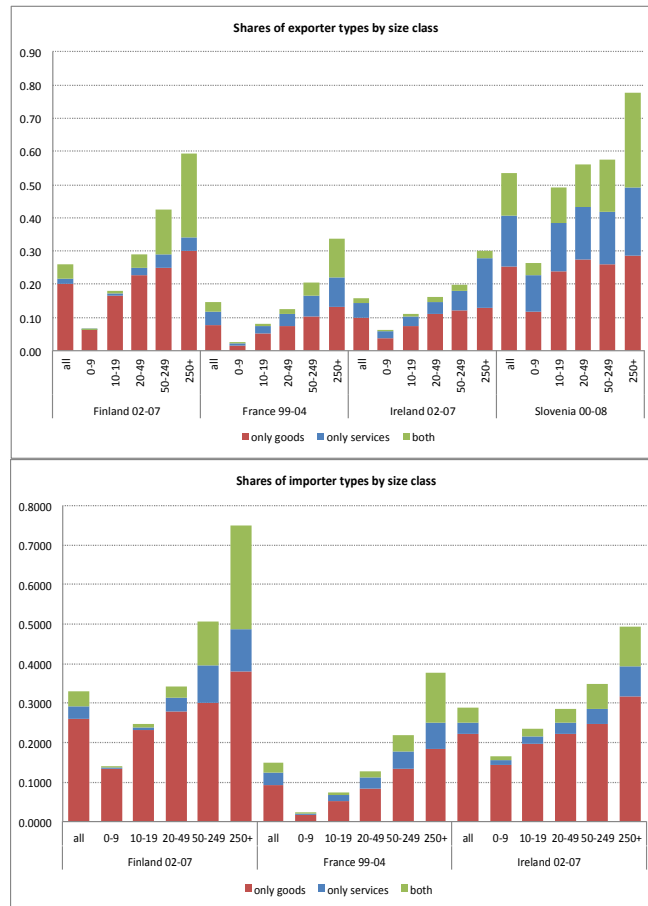
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## Appendix

Figure A1: Type of trade participation of services firms, by countries and size classes, period average (in %)



**Table A1: Size, wage and productivity premia of trading firms (OLS and fixed effects regressions)**

<b>size</b>									
	<b>country</b>	<b>Finland</b>		<b>France</b>		<b>Ireland</b>		<b>Slovenia</b>	
	<b>period</b>	<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>		<b>2000-2008</b>	
OLS	exp only	35.86	(0.000)	55.44	(0.000)	44.02	(0.000)	43.46	(0.000)
	imp only	72.01	(0.000)	92.20	(0.000)	39.29	(0.000)	59.09	(0.000)
	exp&imp	181.44	(0.000)	189.34	(0.000)	58.52	(0.000)	117.46	(0.000)
FE	exp only	15.46	(0.000)	8.40	(0.000)	8.50	(0.005)	27.10	(0.000)
	imp only	23.50	(0.000)	10.63	(0.000)	8.87	(0.000)	31.85	(0.000)
	exp&imp	43.03	(0.000)	17.67	(0.000)	16.27	(0.000)	52.88	(0.000)
	N	47075		122083		38310		23228	
	Firms	10095		35336		13736		3561	
<b>average wages</b>									
	<b>country</b>	<b>Finland</b>		<b>France</b>		<b>Ireland</b>		<b>Slovenia</b>	
	<b>period</b>	<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>		<b>2000-2008</b>	
OLS	exp only	12.11	(0.000)	30.51	(0.000)	10.34	(0.000)	11.86	(0.000)
	imp only	3.74	(0.000)	31.43	(0.000)	9.10	(0.000)	8.43	(0.000)
	exp&imp	18.15	(0.000)	59.67	(0.000)	19.38	(0.000)	25.54	(0.000)
FE	exp only	4.11	(0.000)	4.45	(0.000)	6.39	(0.000)	5.58	(0.000)
	imp only	3.34	(0.000)	2.84	(0.000)	5.47	(0.000)	5.59	(0.000)
	exp&imp	8.64	(0.000)	8.41	(0.000)	13.34	(0.000)	9.28	(0.000)
	N	47074		122083		38310		20213	
	Firms	10095		35336		13736		2785	
<b>labour productivity</b>									
	<b>country</b>	<b>Finland</b>		<b>France</b>		<b>Ireland</b>		<b>Slovenia</b>	
	<b>period</b>	<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>		<b>2000-2008</b>	
OLS	exp only	22.03	(0.000)	24.51	(0.000)	4.35	(0.324)	31.02	(0.000)
	imp only	15.63	(0.000)	26.11	(0.000)	1.23	(0.450)	28.95	(0.000)
	exp&imp	43.30	(0.000)	66.88	(0.000)	12.77	(0.000)	89.06	(0.000)
FE	exp only	7.42	(0.000)	2.96	(0.000)	9.64	(0.002)	14.07	(0.000)
	imp only	10.02	(0.000)	2.78	(0.000)	5.08	(0.000)	14.27	(0.000)
	exp&imp	20.55	(0.000)	8.75	(0.000)	12.86	(0.000)	30.24	(0.000)
	N	47074		122083		38310		20213	
	Firms	10095		35336		13736		2785	

**total factor productivity**

<b>country</b>		<b>Finland</b>		<b>France</b>		<b>Ireland</b>		<b>Slovenia</b>	
<b>period</b>		<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>		<b>2000-2008</b>	
OLS	exp only	18.44	(0.000)	15.68	(0.000)	2.34	(0.583)	23.01	(0.000)
	imp only	6.60	(0.000)	11.11	(0.000)	-2.06	(0.187)	16.25	(0.000)
	exp&imp	30.65	(0.000)	35.82	(0.000)	9.83	(0.000)	63.72	(0.000)
FE	exp only	6.44	(0.000)	15.68	(0.000)	7.97	(0.011)	12.57	(0.000)
	imp only	8.39	(0.000)	11.11	(0.000)	3.83	(0.005)	12.03	(0.000)
	exp&imp	17.93	(0.000)	35.82	(0.000)	10.33	(0.000)	25.00	(0.000)
N		45291		71483		37937		20085	
Firms		9758		20564		13612		2777	

Notes: Standardised coefficients (% interpretation) and p-values in parentheses. Controls: size, size squared, foreign dummy (except for France), importer dummy, industry and year dummies



**Table A2: Exporters' size, wage and productivity premia relative to non-exporters in % (OLS and fixed effects regressions)**

<b>size</b>									
	<b>country</b>	<b>Finland</b>		<b>France</b>		<b>Ireland</b>		<b>Slovenia</b>	
	<b>period</b>	<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>		<b>2000-2008</b>	
OLS	servs only	39.55	(0.000)	30.55	(0.000)	23.59	(0.000)	47.59	(0.000)
	goods only	73.23	(0.000)	75.09	(0.000)	34.78	(0.000)	34.79	(0.000)
	goods&servs	242.61	(0.000)	176.52	(0.000)	40.02	(0.000)	82.22	(0.000)
FE	servs only	17.00	(0.000)	7.83	(0.000)	6.88	(0.000)	24.72	(0.000)
	goods only	2.49	(0.445)	6.40	(0.000)	9.29	(0.001)	17.34	(0.000)
	goods&servs	34.43	(0.000)	15.45	(0.000)	12.14	(0.004)	34.16	(0.000)
	N	47075		122083		32949		23228	
	Firms	10095		35336		12947		3561	
<b>wage</b>									
	<b>country</b>	<b>Finland</b>		<b>France</b>		<b>Ireland</b>		<b>Slovenia</b>	
	<b>period</b>	<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>		<b>2000-2008</b>	
OLS	servs only	10.95	(0.000)	12.98	(0.000)	10.23	(0.000)	11.896	(0.000)
	goods only	26.73	(0.000)	48.84	(0.000)	10.93	(0.000)	15.525	(0.000)
	goods&servs	23.06	(0.000)	53.07	(0.000)	22.23	(0.000)	23.468	(0.000)
FE	servs only	3.87	(0.000)	4.59	(0.000)	9.55	(0.000)	5.657	(0.000)
	goods only	12.66	(0.000)	4.73	(0.000)	7.25	(0.000)	3.698	(0.000)
	goods&servs	4.69	(0.003)	8.17	(0.000)	13.31	(0.000)	5.463	(0.000)
	N	47074		122083		32949		20213	
	Firms	10095		35336		12947		2785	
<b>labour productivity</b>									
	<b>country</b>	<b>Finland</b>		<b>France</b>		<b>Ireland</b>		<b>Slovenia</b>	
	<b>period</b>	<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>		<b>2000-2008</b>	
OLS	servs only	26.59	(0.000)	28.91	(0.000)	13.33	(0.000)	53.839	(0.000)
	goods only	6.64	(0.053)	22.78	(0.000)	1.60	(0.650)	24.54	(0.000)
	goods&servs	26.96	(0.000)	50.04	(0.000)	16.10	(0.042)	79.96	(0.000)
FE	servs only	9.71	(0.000)	4.11	(0.000)	12.45	(0.000)	21.077	(0.000)
	goods only	4.26	(0.045)	3.06	(0.000)	5.18	(0.013)	8.574	(0.000)
	goods&servs	7.72	(0.003)	9.72	(0.000)	8.16	(0.019)	21.815	(0.000)
	N	47074		123883		32949		20213	
	Firms	10095		35827		12947		2785	

<b>total factor productivity</b>									
<b>country</b>		<b>Finland</b>		<b>France</b>		<b>Ireland</b>		<b>Slovenia</b>	
<b>period</b>		<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>		<b>2000-2008</b>	
OLS	servs only	22.58	(0.000)	17.16	(0.000)	12.41	(0.000)	40.238	(0.000)
	goods only	5.93	(0.095)	21.80	(0.000)	1.68	(0.634)	21.296	(0.000)
	goods&servs	24.65	(0.000)	31.64	(0.000)	14.17	(0.049)	66.442	(0.000)
FE	servs only	8.53	(0.000)	17.16	(0.000)	10.04	(0.000)	18.457	(0.000)
	goods only	3.29	(0.142)	21.80	(0.000)	3.73	(0.106)	6.771	(0.000)
	goods&servs	9.48	(0.000)	31.64	(0.000)	5.63	(0.150)	20.096	(0.000)
N		45291		71483		32623		20085	
Firms		9758		20564		12832		2777	

Note: Standardised coefficients (% interpretation) and p-values in parenthesis. Controls: size, size squared, foreign dummy (except for France), importer dummy, industry and year dummies

**Table A3: Importers' size, wage and productivity premia relative to non-exporters in %  
(OLS and fixed effects regressions)**

<b>size</b>							
	<b>country</b>	<b>Finland</b>		<b>France</b>		<b>Ireland</b>	
	<b>period</b>	<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>	
OLS	servs only	70.68	(0.000)	71.32	(0.000)	34.99	(0.000)
	goods only	169.90	(0.000)	94.78	(0.000)	29.89	(0.000)
	goods&servs	371.24	(0.000)	280.30	(0.000)	52.23	(0.000)
FE	servs only	25.36	(0.000)	9.83	(0.000)	8.64	(0.000)
	goods only	16.49	(0.000)	8.09	(0.000)	12.91	(0.374)
	goods&servs	42.29	(0.000)	20.09	(0.000)	12.52	(0.000)
	N	46402		123883		32949	
	Firms	9950		35827		12947	

<b>wage</b>							
	<b>country</b>	<b>Finland</b>		<b>France</b>		<b>Ireland</b>	
	<b>period</b>	<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>	
OLS	servs only	3.37	(0.000)	17.84	(0.000)	7.81	(0.000)
	goods only	20.77	(0.000)	51.37	(0.000)	11.63	(0.000)
	goods&servs	17.07	(0.000)	64.58	(0.000)	15.82	(0.000)
FE	servs only	2.72	(0.000)	2.93	(0.000)	7.32	0.071
	goods only	8.91	(0.000)	3.40	(0.000)	3.57	0.035
	goods&servs	5.18	(0.001)	6.70	(0.000)	8.55	0.082
	N	46401		123883		32949	
	Firms	9950		35827		12947	

<b>labour productivity</b>							
	<b>country</b>	<b>Finland</b>		<b>France</b>		<b>Ireland</b>	
	<b>period</b>	<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>	
OLS	servs only	18.28	(0.000)	27.12	(0.000)	0.07	(0.971)
	goods only	17.70	(0.000)	29.94	(0.000)	11.74	(0.006)
	goods&servs	47.92	(0.000)	58.60	(0.000)	5.80	(0.101)
FE	servs only	11.47	(0.000)	3.55	(0.000)	5.65	(0.000)
	goods only	7.88	(0.000)	3.98	(0.000)	3.14	(0.111)
	goods&servs	20.10	(0.000)	6.53	(0.000)	6.13	(0.000)
	N	46401		123883		32949	
	Firms	9950		35827		12947	

**Total factor productivity**

		<b>Finland</b>		<b>France</b>		<b>Ireland</b>	
<b>country</b>							
<b>period</b>		<b>2001-2007</b>		<b>1999-2004</b>		<b>2001-2007</b>	
OLS	servs only	8.85	(0.000)	11.49	(0.000)	-2.48	(0.159)
	goods only	17.63	(0.000)	20.66	(0.000)	10.98	(0.009)
	goods&servs	33.24	(0.000)	32.37	(0.000)	-0.97	(0.769)
FE	servs only	9.32	(0.000)	1.82	(0.006)	4.57	(0.001)
	goods only	8.26	(0.000)	2.30	(0.060)	2.39	(0.253)
	goods&servs	17.62	(0.000)	3.61	(0.019)	3.81	(0.028)
N		44710		71483		32623	
Firms		9642		20564		12832	

Note: Standardised coefficients (% interpretation) and p-values in parenthesis. Controls: size, size squared, foreign dummy (except for France), importer dummy, industry and year dummies

**Table A4: Numbers of firms switching trading status**

	Finland 04-05	France 01-02	Ireland 03-05	Slovenia 02-06
no trade to exp only	52	41	6	43
no trade to imp only	67	27	57	22
no trade to exp&imp	12	9	12	13
exp only to exp&imp	24	19	17	20
imp only to exp&imp	56	38	26	60
Total switchers	211	134	118	158

Source: Indicated sources; own calculations.

**Table A5: Switching premia from switching trading status (full results)**

a) No trade to exporting only

<b>size</b>						
	Finland		France		Ireland	Slovenia
t-2	0.119		0.247		0.199	0.104
t-1	0.089		0.393 *		0.230	0.191
t	0.060		0.459 **		0.302	0.187
t+1	0.091		0.386 *		0.263	0.248
t+2	0.044		0.452 **		0.227	0.283 +
Adj. R-sq	0.10		0.24		0.23	0.13
N	18,273		39,442		6,344	4,704
Firms	3,137		6,852		1,043	679
<b>wage</b>						
t-2	0.071 +		0.155 *		-0.051	0.081
t-1	0.236 **		0.191 **		-0.143	-0.012
t	0.189 *		0.192 **		-0.092	0.159 **
t+1	0.179 *		0.215 **		-0.070	0.143 *
t+2	0.135		0.165 **		-0.102	0.148 **
Adj. R-sq	0.68		0.35		0.49	0.33
N	18,273		39,442		6,344	3,965
Firms	3,137		6,852		1,043	553
<b>labour productivity</b>						
t-2	0.203 *		0.064		0.036	0.047
t-1	0.236 **		0.132		0.087	0.126
t	0.189 *		0.232 *		0.001	0.251 +
t+1	0.179 *		0.272 *		0.053	0.318 *
t+2	0.135		0.294 *		0.051	0.375 **
Adj. R-sq	0.68		0.73		0.83	0.45
N	18,273		39,442		6,344	3,965
Firms	3,137		6,852		1,043	553
<b>total factor productivity</b>						
t-2	0.205 *		0.209 +		0.050	0.016
t-1	0.254 **		0.193		0.108	0.092
t	0.205 **		0.188		-0.146	0.213
t+1	0.174 *		0.205		-0.185	0.343 *
t+2	0.120		0.139		-0.144	0.383 **
Adj. R-sq	0.79		0.57		0.83	0.28
N	17,570		27,668		6,286	3,904
Firms	3,066		5,618		1,037	552

b) No trade to importing only

<b>size</b>						
	Finland	France	Ireland	Slovenia		
t-2	0.056	0.754 **	0.348 **	-0.274		
t-1	0.041	0.793 **	0.403 **	0.141		
t	0.166	0.789 **	0.424 **	0.269		
t+1	0.234 *	0.709 **	0.449 **	0.398 *		
t+2	0.303 **	0.729 **	0.446 **	0.353 +		
Adj. R-sq	0.10	0.24	0.23	0.12		
N	18,348	39,372	6,599	4,613		
Firms	3,152	6,838	1,094	665		
<b>wage</b>						
t-2	0.003	0.136 +	0.102 +	-0.115		
t-1	0.034	0.111	0.117 *	0.020		
t	0.021	0.206 **	0.129 *	-0.027		
t+1	0.017	0.230 **	0.090 +	-0.070		
t+2	-0.025	0.237 **	0.060	-0.076		
Adj. R-sq	0.31	0.35	0.49	0.32		
N	18,348	39,372	6,599	3,849		
Firms	3,152	6,838	1,094	534		
<b>labour productivity</b>						
t-2	0.144	0.072	0.015	0.136		
t-1	0.189 *	0.140 +	0.014	0.069		
t	0.205 *	0.146 *	-0.028	0.142		
t+1	0.216 **	0.214 *	-0.038	0.070		
t+2	0.229 **	0.194 *	-0.033	0.126		
Adj. R-sq	0.68	0.73	0.83	0.43		
N	18,348	39,372	6,599	3,849		
Firms	3,152	6,838	1,094	534		
<b>total factor productivity</b>						
t-2	0.028	-0.021	-0.034	0.095		
t-1	0.076	0.042	-0.027	0.128		
t	0.080	0.101	-0.081	0.197		
t+1	0.098	0.122	-0.100 +	0.175		
t+2	0.107	0.169 +	-0.081	0.278 +		
Adj. R-sq	0.79	0.57	0.83	0.28		
N	17,645	27,605	6,536	3,788		
Firms	3,081	5,606	1,088	533		

c) no trade to exporting and importing

<b>size</b>								
	Finland		France		Ireland		Slovenia	
t-2	0.420	*	0.346		0.133		-0.754	**
t-1	0.510	*	0.739	**	0.315		-0.489	**
t	0.986	**	0.940	**	0.309		-0.257	+
t+1	1.156	**	0.971	**	0.443		-0.153	
t+2	1.246	**	0.974	**	0.469		-0.034	
Adj. R-sq	0.11		0.24		0.21		0.12	
N	18073		39282		6374		4566	
Firms	3097		6820		1049		655	
<b>wage</b>								
t-2	0.151	+	0.482	**	0.229	**	0.204	
t-1	0.469	*	0.222		0.192	+	0.157	
t	0.404	*	0.612	**	0.215	+	0.284	+
t+1	0.210	**	0.540	**	0.263	*	0.254	+
t+2	0.242	**	0.483	**	0.186	+	0.249	
Adj. R-sq	0.31		0.35		0.49		0.32	
N	18073		39282		6374		3807	
Firms	3097		6820		1049		525	
<b>labour productivity</b>								
t-2	0.203		0.382	+	0.470	**	0.499	*
t-1	0.430	**	0.045		0.487	**	0.635	**
t	0.294	*	0.274	*	0.467	**	1.049	**
t+1	0.283	**	0.313	**	0.515	**	1.090	**
t+2	0.198	*	0.173		0.530	**	1.226	**
Adj. R-sq	0.68		0.73		0.83		0.45	
N	18073		39282		6374		3807	
Firms	3097		6820		1049		525	
<b>total factor productivity</b>								
t-2	0.114		0.304		0.559	**	0.511	
t-1	0.376	+	-0.083		0.491	**	0.535	**
t	0.193	+	0.106		0.442	*	0.949	**
t+1	0.116		0.121		0.440	*	0.878	*
t+2	0.043		-0.030		0.465	*	1.073	**
Adj. R-sq	0.79		0.57		0.83		0.28	
N	17370		27547		6316		3747	
Firms	3026		5591		1043		524	



d) exporting only to exporting and importing

<b>size</b>						
	Finland		France		Ireland	Slovenia
t-2	-0.020		0.752 *		-0.057	0.574 +
t-1	0.267		0.676 +		-0.085	0.506
t	0.345 +		0.753 *		-0.092	0.573 *
t+1	0.421 *		0.752 *		-0.119	0.726 **
t+2	0.447 *		0.642 +		-0.109	0.732 **
Adj. R-sq	0.07		0.19		0.16	0.19
N	761		455		321	808
Firms	144		85		58	135
<b>wage</b>						
t-2	0.019		0.231		0.128	-0.115
t-1	0.007		0.410 **		0.159	-0.056
t	-0.039		0.432 **		0.147	-0.032
t+1	-0.020		0.486 **		0.100	-0.063
t+2	0.048		0.461 *		0.085	-0.041
Adj. R-sq	0.33		0.43		0.51	0.59
N	761		455		321	796
Firms	144		85		58	133
<b>labour productivity</b>						
t-2	0.381 +		0.356 +		-0.018	0.182
t-1	0.407 *		0.364 +		-0.055	0.209
t	0.386 +		0.314 +		-0.093	0.264 +
t+1	0.392 +		0.217		-0.122	0.310 +
t+2	0.339 +		0.309		-0.083	0.329 *
Adj. R-sq	0.53		0.65		0.79	0.45
N	761		455		321	796
Firms	144		85		58	133
<b>total factor productivity</b>						
t-2	0.380 +		0.297		0.045	0.184
t-1	0.413 +		0.291		-0.001	0.211
t	0.416 +		0.259		0.006	0.269 +
t+1	0.414 +		0.159		-0.002	0.302 +
t+2	0.296		0.272		0.055	0.361 *
Adj. R-sq	0.58		0.53		0.79	0.36
N	746		379		318	795
Firms	143		78		58	133

<b>Export value</b>						
t-2	0.777	*	1.200	*	-0.164	-0.191
t-1	0.753	*	0.826		-0.358	-0.130
t	0.667	+	1.098	+	-0.382	0.324
t+1	0.538		0.631		-0.046	0.384
t+2	0.528		0.353		-0.233	0.289
Adj. R-sq	0.41		0.13		0.70	0.35
N	715		455		321	808
Firms	142		85		58	135

e) importing only to exporting and importing

<b>size</b>							
	Finland		France		Ireland		Slovenia
t-2	0.333	*	1.133	**	-0.318	*	-0.150
t-1	0.313	*	1.180	**	-0.300	*	-0.092
t	0.346	*	1.133	**	-0.290	+	-0.049
t+1	0.370	*	1.195	**	-0.262		-0.049
t+2	0.313	*	0.933	**	-0.342	+	-0.134
Adj. R-sq	0.30		0.26		0.35		0.31
N	2801		798		2045		820
Firms	498		145		338		144
<b>wage</b>							
t-2	0.049		0.263	**	0.111		0.025
t-1	0.076	*	0.277	**	0.097		0.030
t	0.077	*	0.380	**	0.105		0.065
t+1	0.061		0.343	**	0.122	+	0.089
t+2	0.125	*	0.454	**	0.048		0.134 *
Adj. R-sq	0.49		0.64		0.55		0.60
N	2801		798		2045		762
Firms	498		145		338		133
<b>labour productivity</b>							
t-2	0.079		0.385	*	-0.061		0.631 **
t-1	0.069		0.359	*	-0.082		0.666 **
t	0.117		0.333	*	-0.006		0.667 **
t+1	0.201	*	0.354	*	-0.057		0.712 **
t+2	0.211	*	0.248		-0.079		0.730 **
Adj. R-sq	0.50		0.61		0.78		0.47
N	2801		798		2045		762
Firms	498		145		338		133
<b>total factor productivity</b>							
t-2	0.091		0.257		-0.073		0.469 **
t-1	0.088		0.225		-0.086		0.523 **
t	0.118		0.237		-0.022		0.529 **
t+1	0.212	*	0.225		-0.050		0.608 *
t+2	0.213	*	0.125		-0.088		0.629 **
Adj. R-sq	0.54		0.60		0.81		0.41
N	2783		732		2023		762
Firms	498		139		337		133

<b>Import value</b>						
t-2	na	-0.014	0.648	+	0.741	+
t-1		0.125	0.706	*	1.231	**
t		0.490	0.866	**	1.347	**
t+1		0.837	0.736	**	1.585	**
t+2		0.630	0.739	*	1.456	**
Adj. R-sq		0.09	0.65		0.42	
N		798	2045		820	
Firms		145	338		144	

Notes: Coefficients from OLS regression. Switch in period  $t$ . Regressions control also for size (except where size is the dependent variable).

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