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**A PORTRAIT OF TRADING FIRMS  
IN THE SERVICES SECTORS  
- COMPARABLE EVIDENCE  
FROM FOUR EU COUNTRIES**

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## **Abstract**

We establish a set of stylised facts for trade and trading firms in five market services sectors using comparable firm-level and services data from four EU countries. Our analysis shows that exports account for much lower shares of overall sales in the services sectors than in manufacturing. In line with this there are also fewer firms engaged in trade in the services sectors than in manufacturing; trade intensities, in turn, vary by services sector and country. Trade by services firms is somewhat less dominated by firms that both export and import than trade by manufacturing firms. In terms of value, trade in services is considerably more important than in manufacturing, yet the majority of services firms trade mostly goods. Larger and more productive firms are more likely to be two-way traders and to engage in both goods and services trade. Few firms export many services or to many countries. Those firms that export services to many countries account for a large share of export value; this is not the case for all countries for the firms which export many services.

**Keywords:** exports, imports, services, international comparison

**JEL classification:** F14, D22, L80

## 1. Introduction

According to the World Development Indicators, 69% of global value added was generated in services sectors in 2008 compared to 53% in 1970 (World Bank, 2010).<sup>1</sup> In line with the increasing importance of the services sectors especially in developed countries, trade in services has increased substantially since the mid-1990s.<sup>2</sup> Not all services are traded by services sector firms, indeed many accompany the delivery of goods by manufacturing firms. The opposite is true as well, however, as many services sector firms also trade goods. While there is plenty of evidence from manufacturing, we still know very little about trade and trading firms in the services sectors. This is where the present paper makes its contribution.

In this paper, we focus on the trading activities of firms in five main services sectors and capture trade in both services and goods. We document in detail the characteristics of the firms that trade, how important foreign markets are for these firms and finally what they trade. We also compare these patterns to evidence for manufacturing. For this purpose, we gather for the first time, activity and firm-level trade data of four EU countries to provide comparable evidence on the development of the margins of trade in the market services sectors.

According to results obtained from firm-level evidence from the manufacturing sectors, shares of trading firms vary widely by country. For example, the international comparison of 14 countries by ISGEP (2008) shows that export participation of firms with at least 20 employees ranges from 26 per cent in Columbia to 83 per cent in Sweden. Furthermore, since the seminal paper of Bernard and Jensen (1995) we know that larger, more productive, more capital and skill-intensive firms are more likely to become exporters.<sup>3</sup> Also, a small number of large trading firms account for the bulk of trade. Moreover, from customs data on trade in goods we have learned that very few firms trade many products with many countries (e.g. Bernard, Jensen, Redding and Schott (2007); Castellani, Serti and Tomasi (2010); Eaton, Kortum and Kramarz (2011); Mayer and Ottaviano (2008)). For firms that trade services a similar set of stylised facts has been recently produced by Breinlich and Criscuolo (2011) for the UK, Gaulier, Milet and Mirza (2010) for France, Kelle and Kleinert (2010) for Germany, and Federico and Tosti (2012) for Italy. Kox and Rojas-Romagosa (2010) as well as Grublješić and Damijan (2011) compare the performance of exporters in manufacturing and services sectors in the Netherlands and Slovenia, respectively. Evidence for specific services sectors is

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<sup>1</sup> Two factors that may have contributed to this figure – artificially, from our point of view – are that, first, public sector services may well have grown faster than global GDP and, second, outsourcing may have moved certain jobs from manufacturing firms to services sector firms. However, these hardly account for the total increase.

<sup>2</sup> Eurostat (2008) records EU27 exports of services growing mostly at an equal or faster rate than goods exports in 2000-2006. In just over a decade the ratio of world services trade to world GDP has increased from 8.2 per cent in 1995 to 12.2 per cent in 2008 (World Bank, 2010). This is a small fraction compared to world merchandise trade (52% of world GDP) but still an impressive development.

<sup>3</sup> This literature has been summarised by Greenaway and Kneller (2007) and Wagner (2007, 2012).

provided by Bernard et al. (2010) for wholesale and retail trade in the U.S. and by Temouri, Vogel and Wagner (2010) for the business services sector in Germany, France and the UK.

Our paper is broader than the last set of papers mentioned in that we examine trading patterns in five market services sectors, in particular wholesale and retail trade; hotels, bars and restaurants; transport, storage and communication; real estate, renting and business services; and other community, social and personal service activities. Moreover, we are able to distinguish between trade in both goods and services by services sector and also by manufacturing firms. Given the importance of imports, we provide results for exporters as well as importers and discuss the importance of two-way traders. Finally, we provide comparable evidence using unique data sets for four rather diverse EU countries: Finland, France, Ireland and Slovenia. While France is a large, semi-open economy, the other three countries are small, more open economies. The countries are quite different in their levels of development and/or the structure of their economy. Slovenia is a relatively new EU country with one of the highest level of state control in Europe. Finland is geographically more remote in Europe and its services sector is not very internationalised. Ireland is a highly outward oriented economy (the ratio of exports of goods and services to GDP was as high as 95 per cent in 2007–2011) with a large presence of foreign multinational firms.

Despite these differences across countries we are able to establish a set of stylised facts for trade and trading firms in the market services sectors and to compare them with results for manufacturing firms. Our analysis shows that exports and imports in the services sectors have grown faster than sales, but also faster than exports and imports in manufacturing during the early 2000s in all countries except Ireland. Exports account for a much lower share of overall sales in the services sectors than in manufacturing. In line with this there are also fewer firms engaged in trade in the services sectors than in manufacturing. Trade intensities, in turn, vary by services sector and country. While still in the minority relative to two-way traders, firms that export only and firms that import only play a much larger role in the services sectors than in manufacturing. In terms of value, trade in services is considerably more important in the services sectors than in manufacturing, yet the majority of services firms trade mostly goods, suggesting that the traded services are of much higher value than the goods. Not unlike manufacturing, larger and more productive service firms are more likely to engage in trade, in particular in both exporting and importing and in trading both goods and services. Few firms export many services or to many countries. Those firms that export services to many countries account for a large share of export value; however, this is not the case in all countries for firms that export many services.

The remainder of this paper is structured as follows: Section 2 provides a data description. Section 3 presents the main analysis. Section 4 summarises and discusses our findings.

## 2. Data

We use unique datasets from the official agency or agencies entrusted with data collection in each country. Our datasets span overlapping but not fully identical periods in the first decade of the 21<sup>st</sup> century. By merging different datasets depending on the country, we can determine firm's dimensions and value of trade as well as their industry classification, ownership, sales, employment and capital stocks. Descriptions of each country's data sources are provided below. Table 1 provides a summary of the sectors covered in each country. There is no data for wholesale and retail trade in France. Also, there are some differences among the countries in coverage at the 2-digit level.

**Table 1 Sectoral coverage (NACE rev 1.1)**

Time period	Finland 2002–2007	France 1999–2004	Ireland 2001–2007	Slovenia 2000–2008
G Wholesale and retail trade	50–52	na*	50–52	50–52
H Hotels, bars and restaurants	55	55	55	55
I Transport, storage and communication	60–64	63–64	60–64	60–64
K Real estate, renting and business activities	70–74	70–72, 74	70–74	70–74
O Other community, social and personal service activities	90–93	90, 92–93	92–93	92–93
D Manufacturing	15–37	15–37	15–37	15–37

Note: \*Information on the wholesale and retail trade sector is not available for France.

Industries: 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.

### *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>4</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>5</sup> includes about 2,000 manufacturing and services sector firms per year that are known 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.

<sup>4</sup> The manufacture of radio, television and communication equipment and apparatus (NACE 32) was removed for confidentiality reasons.

<sup>5</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.

## *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 (mainly belonging to Mode I according to the GATS definition<sup>6</sup>) across 150 countries. Second, we match this 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 surveys cover manufacturing firms with 20 or more employees and services sector firms with 30 or more employees. Firms with less than 30 employees in the services sector are randomly registered each year, and represent around 60% of the service firms in the dataset. After 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>7</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. Information on services imports is only collected since 2006; information on services exports is only collected since 2007.

In order to complete the picture for Ireland, we use an additional survey database. The data underlying Figure 9, Figure 10 and Table 9 are based on the Survey of International Trade in Services and

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<sup>6</sup> Mode 1: cross-border supply covers services flows from one country to another country (e.g. banking or architectural services transmitted via telecommunications or mail). Mode 2: consumption abroad refers to situations where a service consumer (e.g. tourist or patient) travels to another country to obtain a service. Mode 3: commercial presence 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. Mode 4: presence of natural persons refers to persons of one country entering the territory of another country to supply a service (e.g. accountants, doctors or teachers).

<sup>7</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.

Royalties and the Survey of Manufacturing and Non-Financial Service Companies (Foreign). The purpose of these surveys is to provide Balance of Payments (BOP) and International Investment Position statistics. The results are also used in compiling National Accounts estimates. They cover about 500 manufacturing and non-financial enterprises (i.e. excluding NACE Rev.2 divisions 64-66), which are BOP relevant (i.e. have transactions with non-residents). The information in the above-mentioned figures and the table refers to firms in the 5 NACE sectors that we study (see Table 1).<sup>8</sup>

### *Slovenia*

The data for Slovenia come from the AJPES (Agency of the Republic of Slovenia for Public Legal Records and Related Services) and from the 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 a part of the information on services exports. Information on services imports is not available. The 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 Balance of Payments (BOP). Note that the Customs Office collects only data for services that are related to 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. We also exclude observations of firms that report zero sales and zero wages. This still means that we work with stratified samples for up to 20 employees in Ireland and 30 employees in France, and for small and medium-sized firms in Finland.

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<sup>8</sup> We are grateful to Stephen McDonagh of the CSO for extracting this information.



Table 2 gives the average number of firms per year for all services sectors and for five size classes for all four countries. For Slovenia introducing a lower bound on firm size is most restrictive in terms of the reduction in sample size. As firms with less than 10 employees account for a large share of the overall number of services sector firms in all countries we will display results for this group whenever we show breakdowns by firm size, but the general analysis is on the 10+ employee sample. While many results will be presented for all sectors jointly, we will be careful to point out where differences may be resulting from differences in the sectoral coverage. This refers in particular to the wholesale and retail trade sector (G) which is not available for France.

**Table 2 Average number of firms per year by sector and size class by number of employees**

		1-9	10-19	20-49	50-249	250+	total	sample
								10+
Finland 2002-2007	all services	42486	4120	2368	1096	264	50334	7848
	G	15426	1750	907	379	111	18573	3147
	H	4281	351	189	70	15	4906	625
	I	7355	641	312	159	55	8522	1167
	K	12981	1190	850	443	74	15538	2557
	O	2443	188	110	45	9	2795	352
	D (manuf)	7728	1469	1256	894	219	11566	3838
France 1999-2004	all services	31885	6385	7624	4994	1347	52235	20350
	G	na	na	na	na	na	na	na
	H	7264	1388	1841	662	120	11275	4011
	I	781	223	203	107	48	1362	581
	K	20031	4092	4945	3855	1090	34013	13982
	O	3809	682	635	370	89	5585	1776
	D (manuf)	151	565	12187	8729	2357	23989	23838
Ireland 2001-2007	all services	4370	1871	2249	1161	193	9844	5474
	G	1813	858	988	435	65	4159	2346
	H	597	337	508	326	22	1790	1193
	I	318	129	156	76	25	704	386
	K	1284	411	447	259	70	2471	1187
	O	358	136	150	65	11	720	362
	D (manuf)	1895	913	918	701	173	4600	2705
Slovenia 2000-2008	all services	16403	1324	790	395	71	18983	2580
	G	7474	609	348	161	26	8618	1144
	H	948	104	65	36	11	1164	216
	I	1345	116	89	60	18	1628	283
	K	6051	440	255	109	13	6868	817
	O	585	55	33	29	3	705	120
	D (manuf)	3329	541	527	568	173	5138	1809

Note: Own calculations based on national data sets. na = not available.

### **3. Descriptive Analysis**

In this section we will first discuss the importance of trade in services sectors. We go on to describe which services sector firms trade, how much they trade and what they trade, i.e. services and/or goods. This latter aspect includes a picture of the micro level, i.e. the number of services traded by firm and across trading partners. As far as it is possible we compare the evidence obtained for the services sectors to evidence from manufacturing and to evidence previously established in the literature.

#### **3.1 How important is trade in the services sectors?**

We first discuss how important overall trade in goods and services is for firms in the services sectors. As shown in Table 3, aggregate exports in the five market services sectors account only for a small share of overall sales, ranging from between 3.7% in France (though without the wholesale and retail sector) to 12.9% in Ireland in the last year each country is observed. For comparison, the same shares in the manufacturing sector are 6-9 times larger in all countries. The ratio of aggregate exports to aggregate sales in the services sectors varies somewhat by year in each country. A clear trend when looking at the figures year-on-year is evident only in France and Slovenia, but the increases in these two countries are moderate at .8 and 4.4%, respectively. In manufacturing the variation was larger and there are clearer trends: Finland and France saw moderate declines, whereas Slovenia and Ireland saw somewhat larger increases. The annual average growth rates of the individual series (aggregate exports and aggregate sales) over the observed period displayed in the right part of Table 3 show that in all countries except Ireland, the growth rate of aggregate exports in the services sectors outpaced growth in aggregate sales.<sup>9</sup> In manufacturing this was the case for Ireland and Slovenia but differences in the growth rates of exports and sales are smaller than in the services sectors.

Turning to imports the comparison is more difficult since there is no data for Finland and in Slovenia only imports of goods are covered. The shares of aggregate imports in aggregate sales in the services sectors differ less from those in the manufacturing sector than the export shares. France is the only country where the import to sales ratio in manufacturing exceeds that in services by a factor 6. Comparing across individual services sectors it seems as though some of this may be attributable to the lack of information on the wholesale and retail trade sector (G) in France. As regards annual average growth rates of aggregate imports and sales, the growth rates of imports in the services sectors exceeded those of sales (Ireland again being the exception). Except in France this is true also for the growth of imports in manufacturing.

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<sup>9</sup> Shares of aggregate exports in aggregate sales vary from year to year. Thus if the annual average growth rate of aggregate exports exceeds that of aggregate sales over the period this is not inconsistent with a decrease in the share of aggregate exports in aggregate sales between the first and the last year.

**Table 3 Share of aggregate exports and imports in sales, and average growth rates by sector (in %)**

	exports/sales		imports/sales		Average annual growth rates		
	change		change		exports	imports	sales
	last-first	year	last-first	year			
avg.	year	avg.	year				
<b>All services</b>							
Finland 2002-2007	7.3	-0.2	na	na	3.6	na	2.7
France 1999-2004	3.6	0.8	3.0	0.8	12.5	13.8	6.8
Ireland 2001-2007	12.9	-2.1	17.0	-3.1	3.1	1.3	7.9
Slovenia 2000-2006	5.6	4.4	25.6	6.8	15.8	6.3	1.6
<b>G</b>							
Finland 2002-2007	5.9	0.7	na	na	3.6	na	4.8
France 1999-2004	na	na	na	na	na	na	na
Ireland 2001-2007	6.2	5.2	19.7	1.2	30.0	6.0	7.6
Slovenia 2000-2006	4.6	4.1	32.9	9.0	17.8	6.5	1.7
<b>H</b>							
Finland 2002-2007	0.2	0.2	na	na	185.1	na	2.7
France 1999-2004	0.6	-0.1	0.5	0.0	3.2	7.3	3.9
Slovenia 2000-2006	2.6	-1.5	0.8	0.0	-9.7	8.4	0.1
<b>I</b>							
Finland 2002-2007	11.7	-3.5	na	na	-0.2	na	4.3
France 1999-2004	3.6	1.9	3.6	0.0	29.5	14.5	11.7
Slovenia 2000-2006	5.9	1.1	5.8	-2.5	5.4	-3.1	1.2
<b>K</b>							
Finland 2002-2007	11.0	-0.1	na	na	3.0	na	1.4
France 1999-2004	4.2	0.8	3.0	1.5	7.9	13.6	3.7
Ireland 2001-2007	29.1	-22.6	13.1	-17.0	-2.7	-11.9	17.4
Slovenia 2000-2006	12.4	15.9	13.3	6.5	28.6	10.2	1.6
<b>O</b>							
Finland 2002-2007	0.8	0.2	na	na	12.9	na	2.6
France 1999-2004	2.3	0.3	5.0	0.3	11.9	6.8	4.6
Slovenia 2000-2006	7.3	-8.2	2.9	0.5	-15.2	18.3	3.7
<b>HIO</b>							
Ireland 2001-2007	20.5	-8.0	13.0	-5.1	-4.0	-3.6	2.0
<b>D (manuf)</b>							
Finland 2002-2007	44.9	-3.5	na	na	1.9	na	2.7
France 1999-2004	25.3	-1.9	18.6	-0.4	0.0	1.0	1.1
Ireland 2001-2007	76.8	8.0	22.4	4.3	7.0	9.6	5.0
Slovenia 2000-2006	49.7	10.7	29.9	5.3	5.9	5.3	2.1

Note: Own calculations based on national data sets for firms with a median of 10 or more employees over the sample period. Data for Slovenia are only for 2000-2006 because exports more than doubled between 2006 and 2007 after a change in the reporting requirements on the balance sheets. Imports for Slovenia cover only goods but not services imports. For Ireland, sectors H, I and O had to be combined due to confidentiality reasons. na = not available.

Comparing individual services sectors we find that shares of both exports and imports in sector H (hotels and restaurant) are very low. This may well reflect that ‘consumption abroad’ (mode 2 of services trade according to GATS), i.e. the case where a consumer (e.g. tourist) travels to another country to obtain a service is not at all or is under recorded in our datasets. Also firms in sector O

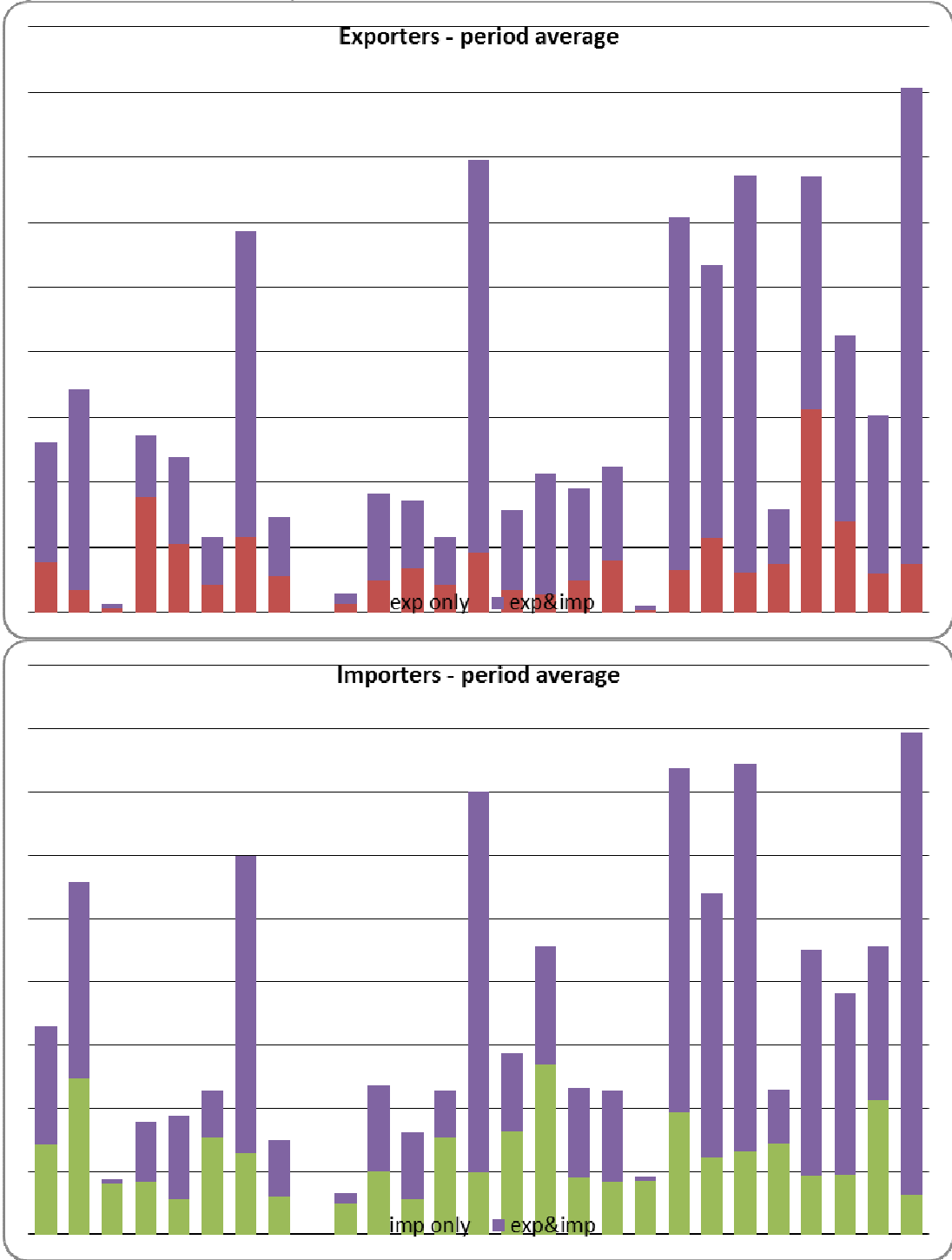
(other service activities) trade very little in Finland and Slovenia, but about the same as firms in the other services sectors in France. In Finland the share of aggregate exports in aggregate sales in sector I (transport, storage and communication) is higher than the average over all services sectors, but the opposite is true for France and Slovenia. Export shares in sector K (real estate, renting and business activities) are above average in each country. Import shares are largest in wholesale and retail trade based on only Ireland and Slovenia. Thus, overall trade in goods and services plays a small (smaller than in manufacturing) but non-negligible role in the services sectors and it has been growing steadily in all countries over the time period observed.

### **Which firms trade goods and services?**

This section describes which firms are engaged in trade in terms of the dimensions they trade in, firm size and ownership. In Figure 1 we show that in line with trade being less important in services than in manufacturing there are also typically no more than a third of services sector firms that import or export compared to 60% or more among manufacturing firms. Slovenia is an exception in that more than 50% of its services sector firms are exporters or importers compared to roughly 80% of manufacturing firms. As is the case in manufacturing, there are more importers than there are exporters across most sectors and countries. Sector K (real estate, renting and business services) is the only sectors where exporters outnumber importers in all countries. The shares of exporters are above services sector average in wholesale and retail trade (G) and in transport, storage and communication (I). The only sector with a higher than average number of importers in all countries is wholesale and retail trade. The observation that there are fewer traders in the services sectors than in manufacturing is in line with results for Belgium, the Netherlands and the UK presented in, respectively, Kox and Rojas-Romagosa (2010), Muûls and Pisu (2009) and Breinlich and Criscuolo (2011). Interestingly, though, in the UK the share of traders in business services, computer and R&D is between those for low and for high-tech manufacturing.

Figure 1 also shows that the share of one-way traders is proportionally higher in the services sectors than in manufacturing. This is true especially for importers where in many sectors nearly half of them do not also export. Breinlich and Criscuolo (2011) show that the share of one-way traders is also proportionately higher among UK services sector firms than among UK manufacturing firms, however, in their analysis this is much more pronounced among exporters than among importers.

**Figure 1 Shares of traders by sector (%)**

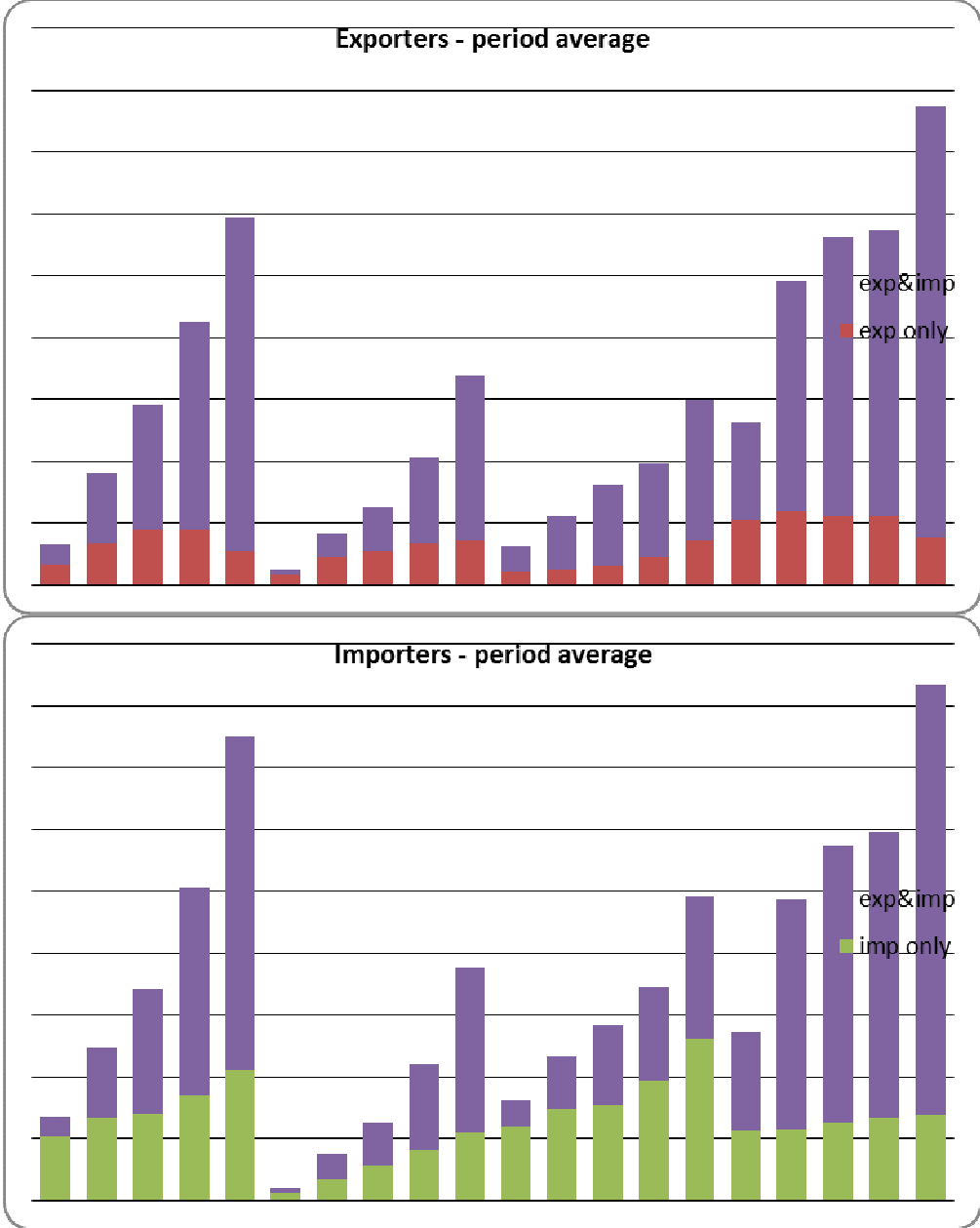


Note: Own calculations based on national data sets for firms with a median of 10 or more employees over the sample period. Imports for Slovenia cover only goods but not services imports.

In all four countries the shares of exporters and importers increase with firm size (see Figure 2). The share of one-way traders among all exporters and all importers is proportionately much higher among smaller firms. An exception here is Ireland where firms that only import account for more than half of importers in all firm size classes. The share of one-way traders increases somewhat with firm size.

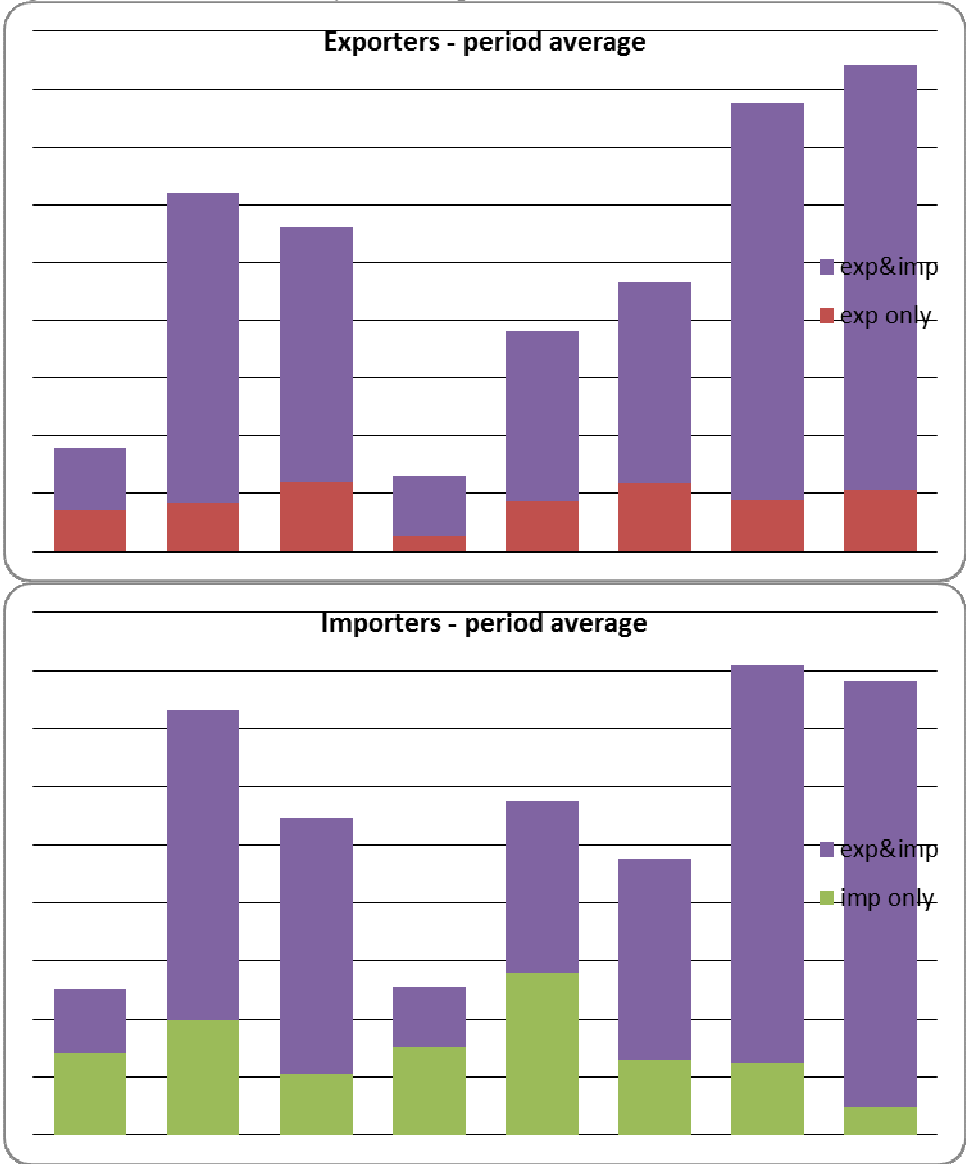
Except in Slovenia where the shares are nearly equal across size classes, the shares of one-way traders increase more strongly with firm size among importers than among exporters.

**Figure 2 Traders by size class, all services sectors (%)**



Note: Own calculations based on national data over the sample period for all services sectors combined. Imports for Slovenia cover only goods but not services imports.

**Figure 3 Shares of traders by ownership, all services sectors**



Note: Calculations based on national data sets for firms in all services sectors combined with a median of 10 or more employees over the sample period. Imports for Slovenia cover only goods but not services imports.

In terms of ownership, multinationals – whether domestic or foreign-owned – are more active in foreign trade than service firms with local owners and no affiliates abroad (see Figure 3). There are proportionally higher shares of one-way traders among domestic firms than among MNEs; among Finnish and Irish importers there are actually more one- than two-way traders among domestic importers. On average, foreign MNEs are slightly more active in foreign trade participation than domestic MNEs, but the differences are small and not quite universal. Among domestic firms, trading is much more common in Slovenia than in Finland or Ireland (there are no data on ownership for France).



In the following we investigate the relative importance of the determinants of trading status presented in the univariate tabulations above in a multivariate framework by running probit regressions of the following form:

$$Y_{it} = \text{Exp only}_{it-1} + \text{Imp only}_{it-1} + \text{Exp\&Imp}_{it-1} + \text{size}_{it-1} + \text{foreign}_{it-1} + LP_{it-1} + \gamma_i + \gamma_t + \varepsilon_{it}$$

where  $Y_{it}$  represents firm  $i$ 's trading status at date  $t$ , namely Exp only, Imp only and Exp&Imp. We control for differences in firm size, ownership, productivity ( $LP_{it}$ ) as well as 2-digit industry ( $\gamma_i$ ) and year ( $\gamma_t$ ) dummies. To capture differences in firm size, we use four firm size classes (10-19, 20-49, 50-249 and 250+ employees), the smallest firms are the omitted category. Labour productivity ( $LP_{it}$ ) is defined as the log of sales in constant terms divided by the number of employees. The coefficients on Exp only, Imp only, and Exp&Imp need to be interpreted relative to the omitted category which is firms that do not trade. This specification is similar to those used by Bernard and Jensen (1999), Bernard and Wagner (2004), and Gaulier, Milet and Mirza (2011).

For each country we estimate separate regressions for the determinants of three different trading statuses: being a firm that exports only, a firm that imports only or one that exports and imports. In reality, these decisions are unlikely to be independent of each other suggesting that we should be estimating a multinomial model instead. We estimated multinomial logit models for each country which yield similar results to those presented in

Table 4 below. However, when testing for validity of the assumption of the independence of irrelevant alternatives (IIA) it is rejected in nearly all cases. Consequently, the results from our probit models cannot be given a causal interpretation and should be taken as indications of correlations. Results here are provided for all services sectors taken together, estimating the same regressions for each of the five services sectors separately yields similar results (tables are available on request).

Table 4 shows that for all three types of trading status and across all countries the previous year's trading status is the single most important determinant of current trading status. This reflects the strong persistence in trading status. Indeed the fact that the coefficients on importing only in the regression on exporting only and vice versa are an indication that there is very little evidence of switching between only importing and only exporting. Instead there is some movement between firms engaged in two-way trade and those engaged in one-way trade. The most likely type of transition appears to be from one-way to two-way trade as shown by the positive and relatively large coefficients on exporting only and importing only in the regressions for exporters&importers.

**Table 4 Probability of being a trader (random effects probit regressions)**

	Finland			France			Ireland			Slovenia		
Probability of being an exporter only												
Exp only <sub>t-1</sub>	1.398	(0.052)	**	1.292	(0.030)	**	3.149	(0.078)	**	1.020	(0.060)	**
Imp only <sub>t-1</sub>	-0.399	(0.064)	**	0.208	(0.034)	**	-0.899	(0.284)	**	-0.335	(0.078)	**
Exp&Imp <sub>t-1</sub>	0.226	(0.048)	**	0.342	(0.028)	**	0.293	(0.086)	**	0.038	(0.055)	
size <sub>t-1</sub> (20-49)	0.049	(0.038)		0.097	(0.023)	**	-0.091	(0.085)		-0.157	(0.057)	**
size <sub>t-1</sub> (50-249)	-0.044	(0.051)		0.141	(0.025)	**	-0.007	(0.091)		-0.191	(0.073)	**
size <sub>t-1</sub> (250+)	-0.387	(0.104)	**	0.153	(0.037)	**	-0.146	(0.142)		-0.576	(0.165)	**
fo <sub>t-1</sub>	-0.064	(0.057)					0.233	(0.083)	**	-0.057	(0.085)	
LP <sub>t-1</sub>	0.147	(0.020)	**	0.154	(0.010)	**	0.016	(0.033)		-0.061	(0.026)	*
Obs/Firms	36657	9059		85676	28864		19438	7248		17370	2644	
LogL	-6812.8			-15197.4			-952.2			-4456.7		
Probability of being an importer only												
Exp only <sub>t-1</sub>	-0.172	(0.057)	**	0.225	(0.034)	**	-0.476	(0.169)	**	-0.185	(0.078)	*
Imp only <sub>t-1</sub>	2.158	(0.026)	**	1.493	(0.028)	**	3.120	(0.040)	**	1.149	(0.059)	**
Exp&Imp <sub>t-1</sub>	0.241	(0.034)	**	0.421	(0.027)	**	0.061	(0.058)		0.037	(0.056)	
size <sub>t-1</sub> (20-49)	0.038	(0.024)		0.157	(0.023)	**	0.080	(0.048)	+	0.049	(0.054)	
size <sub>t-1</sub> (50-249)	0.150	(0.031)	**	0.300	(0.025)	**	0.132	(0.053)	*	-0.013	(0.070)	
size <sub>t-1</sub> (250+)	0.110	(0.054)	*	0.420	(0.034)	**	0.205	(0.084)	*	0.001	(0.139)	
fo <sub>t-1</sub>	0.011	(0.034)					0.096	(0.056)	+	-0.183	(0.081)	*
LP <sub>t-1</sub>	-0.022	(0.013)		0.146	(0.010)	**	-0.047	(0.024)	*	-0.109	(0.024)	**
Obs/Firms	36657	9059		85676	28864		19438	7248		17370	2644	
LogL	-8873.6			-15399.4			-3020.5			-4366.8		
Probability of being an exporter&importer												
Exp only <sub>t-1</sub>	1.134	(0.042)	**	1.180	(0.028)	**	0.991	(0.082)	**	1.127	(0.061)	**
Imp only <sub>t-1</sub>	0.937	(0.038)	**	1.198	(0.028)	**	0.610	(0.063)	**	1.139	(0.060)	**
Exp&Imp <sub>t-1</sub>	2.853	(0.036)	**	2.714	(0.024)	**	3.635	(0.060)	**	2.583	(0.056)	**
size <sub>t-1</sub> (20-49)	0.224	(0.028)	**	0.199	(0.028)	**	0.110	(0.060)	+	0.164	(0.041)	**
size <sub>t-1</sub> (50-249)	0.352	(0.034)	**	0.459	(0.028)	**	0.053	(0.066)		0.334	(0.054)	**
size <sub>t-1</sub> (250+)	0.744	(0.055)	**	0.746	(0.035)	**	0.138	(0.095)		0.835	(0.106)	**
fo <sub>t-1</sub>	0.172	(0.033)	**				-0.020	(0.058)		0.247	(0.057)	**
LP <sub>t-1</sub>	0.135	(0.015)	**	0.259	(0.010)	**	0.078	(0.024)	**	0.358	(0.023)	**
Obs/Firms	36657	9059		85676	28864		19438	7248		17370	2644	
LogL	-6753.0			-11234.0			-2004.7			-5302.0		

Note: Regressions for firms in all services sectors combined with a median of 10 or more employees over the sample period. Marginal effects and standard errors reported in parenthesis. All regressions include 2-digit industry and year dummies. \*\*, \* and + represent significance at 1, 5 and 10% respectively.

When significant, firm size is positively related to importing only and to exporting&importing. The relationship between foreign ownership and trading status is ambiguous or insignificant across trading statuses and countries; for the probability of being an exporter&importer the relationship is positive and significant for two out of three countries where information is available. Productivity is unambiguously positively related only to being an exporter&importer. For the probability of being an importer only it is positive and significant only for France, but negative for the three remaining countries and significant in two of them. For the probability of being an exporter only it is positive and significant in Finland and France, negative and significant for Slovenia and insignificant for Ireland.

### **3.3 How much do firms trade?**

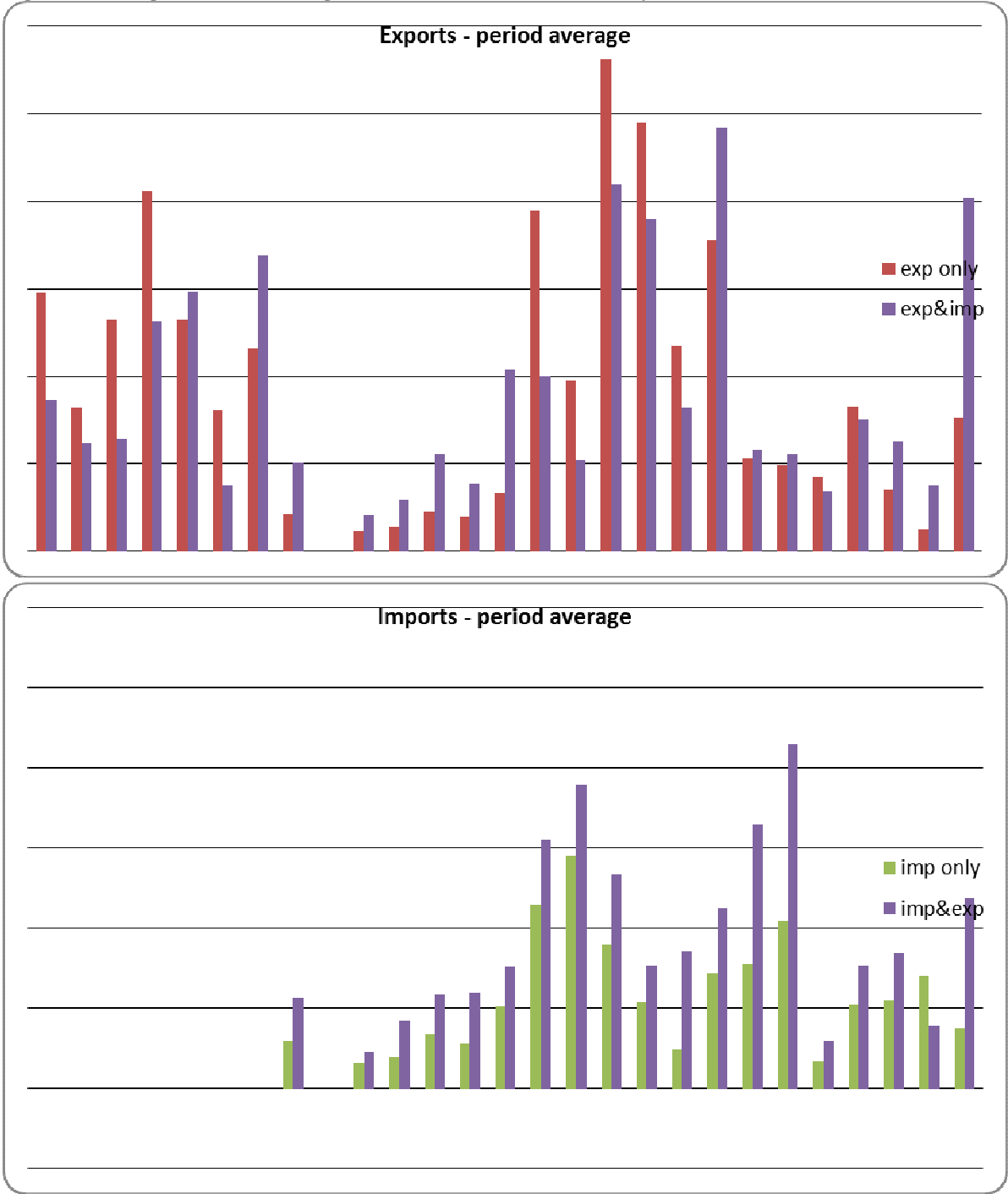
Next we analyse how important trade is to different types of traders (relative to turnover) and how much the different groups contribute to trade. Comparing Figure 4 which shows the average export and import intensities across firms by sector to the share of traders presented in Figure 1, there appears to be something like an inverse relationship for exporting: In countries with a relatively high share of trading firms, these firms appear to have a relatively lower share of export revenue in turnover. France is an exception here with both a small number of trading firms and low average export intensities. Export intensities vary across sectors, more so in countries with relatively higher export intensities. For two-way traders export intensities in the services sectors are much lower than in manufacturing, for one-way traders this is true only for Slovenia and France.<sup>10</sup> While in manufacturing two-way traders have higher export intensities than one-way traders in all four countries, in the services sectors this is the case only for France, in the remaining countries the differences are sector specific. Export intensities are higher than average in transport, storage and communication (I) in all countries except France; the average export intensity for firms that export&import in the real estate, renting and business services sector (K) also exceeds the services sector average for firms that export&import in all countries.

In Ireland and Slovenia where the services sectors average includes information on wholesale and retail trade (G), the average share of imports in turnover is higher in the services sectors than in manufacturing. In France, where we have no data for sector G the opposite is true. The share of imports in turnover is higher for firms that export and import than for firms that only import in each country and sector with the exception of sector O (other services) in Slovenia. The average share of firm's imports in turnover is highest in wholesale and retail trade (G), all other sector's shares are below the average across services sectors.

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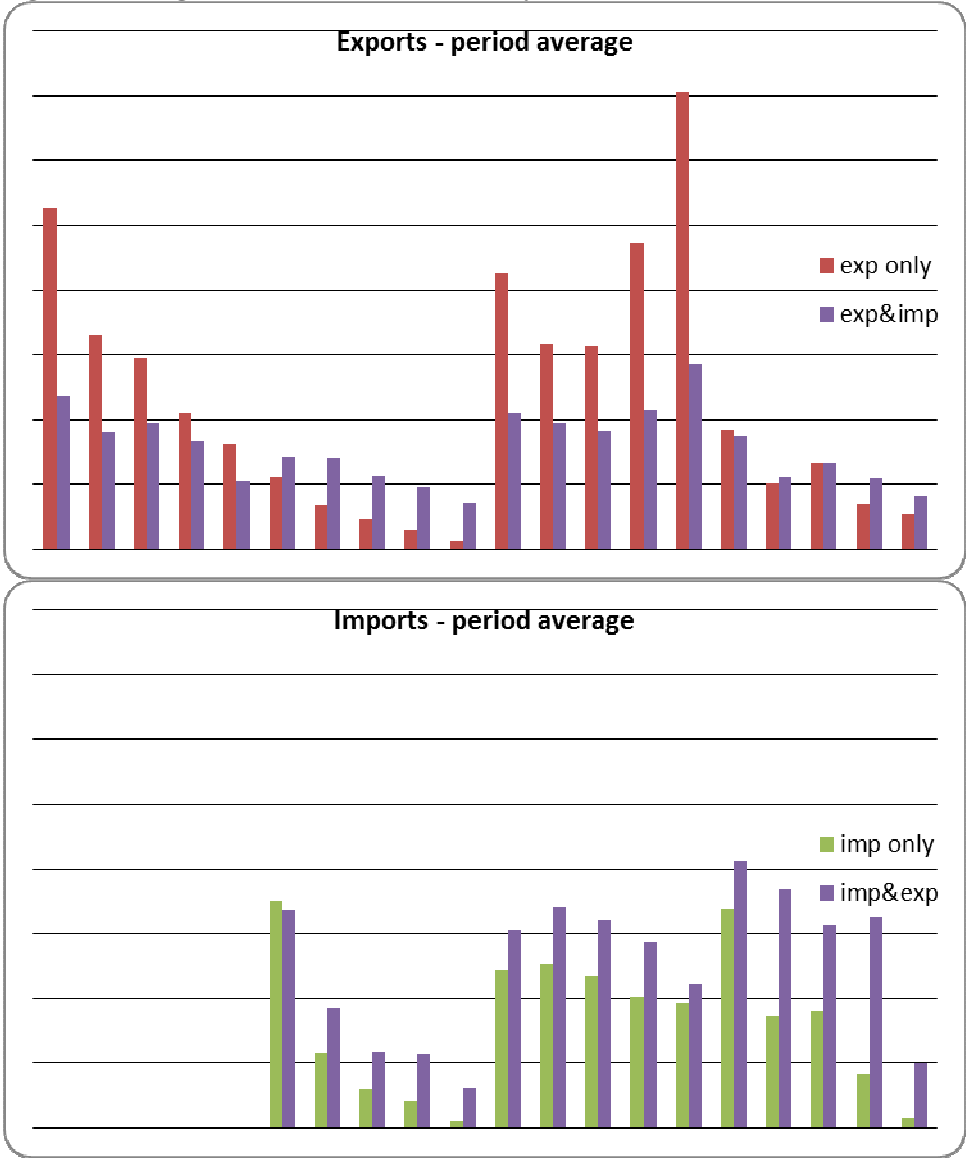
<sup>10</sup> Compared to earlier evidence for manufacturing, the export intensities for the manufacturing sector reported here span the range of values observed in other countries. ISGEP (2008) reports export intensities for all exporters (no distinction between one- and two-way traders) in manufacturing ranging from 18% in Columbia to 53–54% in Ireland and Slovenia for firms with 20 or more employees.

**Figure 4 Average share of trade (goods and services) in turnover by sector**



Note: Own calculations based on national data sets for firms in all services sectors combined with a median of 10 or more employees over the sample period. Imports for Slovenia cover only goods but not services imports.

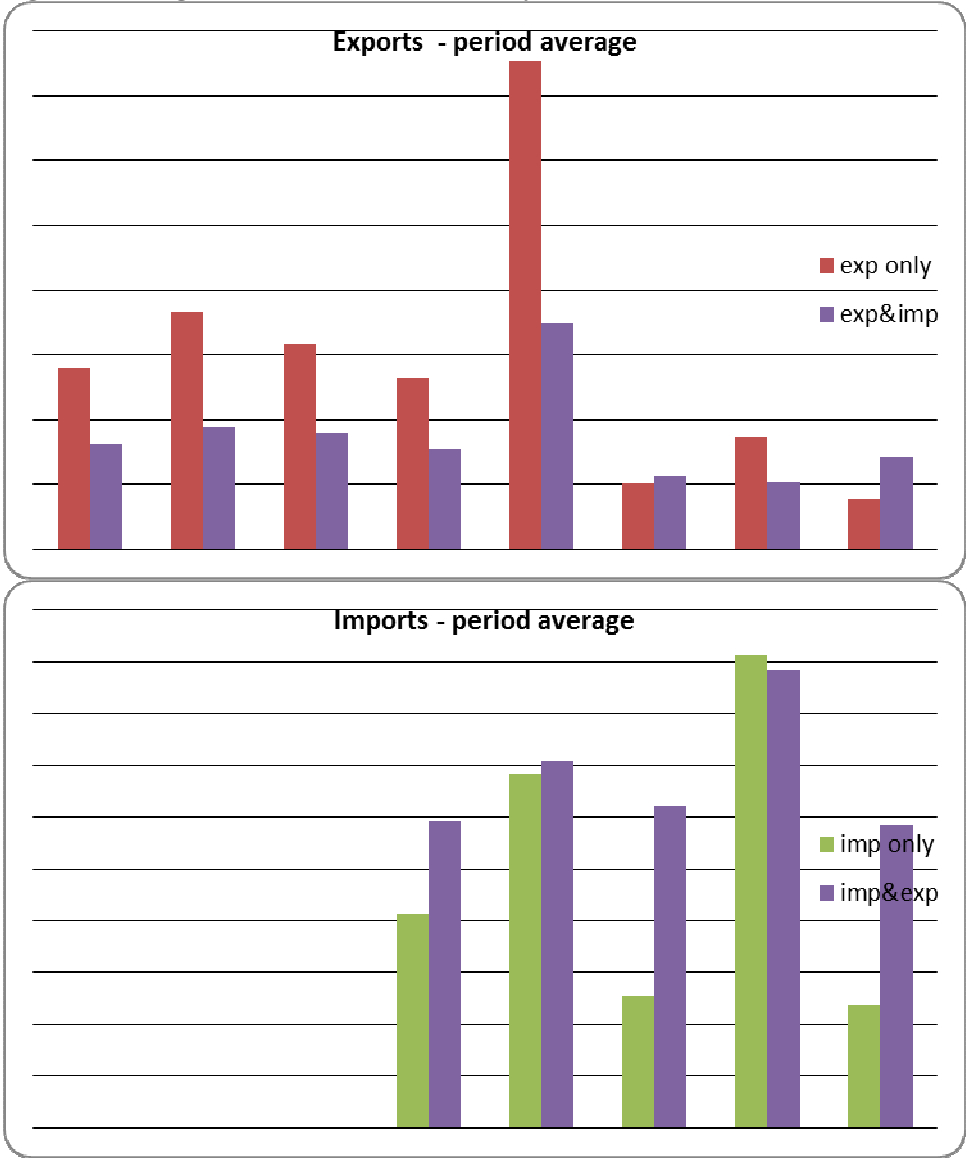
**Figure 5 Average share of trade in turnover by firm size, all services sectors**



Note: Own, Calculations based on national data sets for firms in all services sectors combined over the sample period. Imports for Slovenia cover only goods but not services imports.

In contrast to export and import participation (cf. Figure 2) which is increasing in firm size, Figure 5 shows that export and import intensities decrease in firm size in all countries. Ireland falls somewhat out of this picture as export intensities decrease for the smaller firm size classes, but increase again for firms with 50-249 and 250+ employees. As far as different ownership of firms is concerned, differences in trade intensities tend to be smaller than differences in trade participation (cf. Figure 6). The main difference that emerges is that foreign-owned one-way traders have considerably higher trade intensities than purely domestic firms and to a lesser extent also than domestic multinationals.

**Figure 6 Average share of trade in turnover by owner**



Note: Own calculations based on national data sets for firms in all services sectors combined with a median of 10 or more employees over the sample period. Imports for Slovenia cover only goods but not services imports.

Previous research for manufacturing has shown that exports tend to be dominated by the largest traders, which means that the lion’s share of all trade is in the hands of relatively few firms (see e.g. ISGEP, 2008). Comparing the average across services sectors to manufacturing as shown in Table 5, we can see that the concentration of exports in the hands of the largest 1, 5 or 10% of exporters is similar in services and in manufacturing, in particular for Ireland and Slovenia the differences are not large at the 5 and 10% levels. For France, exports of services firms are more concentrated in the hands of a few large firms than in manufacturing, while it is the opposite in Finland. The top 1% of exporters in the services sectors accounts for between 36% of total exports in Slovenia and 60% in France. For the top 10% of exporters the shares range from 78% to 90% across countries.

For imports the situation is broadly similar. Here the largest 10% of importers account for somewhat lower shares of overall imports in Ireland and Slovenia (in Slovenia services imports are not included) than on the export side. In France the share of imports accounted for by the top 10% of importers is nearly identical to that of exporters at close to 90%. On the import side the differences to manufacturing are not clear-cut both across the different levels within countries and across countries. In terms of individual services sectors it seems that in both sectors H (hotels, bars and restaurants) and O (other services) exports and imports are somewhat less concentrated than on average across services sectors, although this is not the case for sector O in Slovenia. For the remaining sectors these results show very little uniformity across countries.

The contributions to overall trade volumes of one- and two-way traders are a further indicator of the degree of concentration in trade. Figure 7 shows that two-way traders account for the bulk of all services sector exports. However, one-way traders are more important in the services sectors than in manufacturing where they account for less than 3% of total trade in each country. There is considerable variation in the contribution of one-way traders to overall exports. In some sectors their share in overall export values is over 30%.

Also in terms of imports, one-way traders only contribute a small share to total import values. Firms that import only play a larger role in the services sectors than in manufacturing in each of the three countries. Sector H (hotels, bars and restaurants) tends to be the sector where one-way traders account for the highest share of overall import values (around 40%). In contrast in sector I (transport, storage and communication) as well as in sector K (real estate, renting and business activities) one-way traders account for below or just service-sector average shares of overall imports.

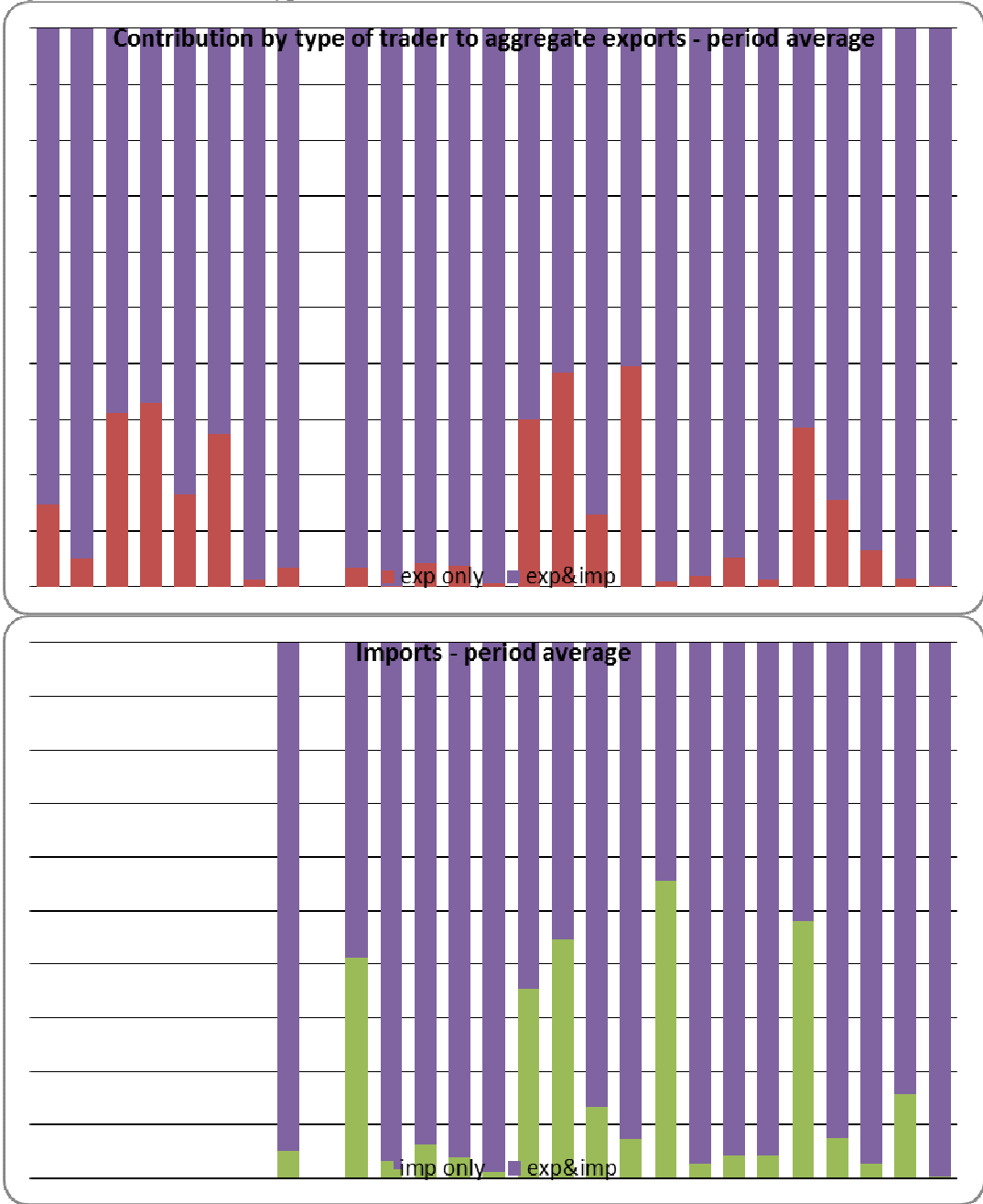
**Table 5 Contribution of largest traders to overall trade**

	Exports			Imports		
	1%	5%	10%	1%	5%	10%
all services	1%	5%	10%	1%	5%	10%
Finland 02-07	40.3	67.1	77.9	na	na	na
France 99-04	59.6	82.5	90.3	52.6	80.4	89.1
Ireland 01-07	56.6	83.2	90.4	42.7	70.7	81.3
Slovenia 00-08	36.3	65.2	78.2	42.0	65.3	76.2
G						
Finland 02-07	47.2	73.3	83.9	na	na	na
France 99-04	na	na	na	na	na	na
Ireland 01-07	54.0	79.8	87.0	32.3	63.2	75.4
Slovenia 00-08	31.7	62.1	76.4	36.5	61.4	71.8
H						
Finland 02-07	na	na	na	na	na	na
France 99-04	46.8	74.7	85.2	54.3	75.9	84.7
Ireland 01-07 (HO)	c	64.4	71.6	c	62.0	75.1
Slovenia 00-08	m	42.6	65.3	20.7	47.7	64.7
I						
Finland 02-07	37.6	63.9	75.9	na	na	na
France 99-04	59.9	91.6	95.5	31.5	66.2	81.0
Ireland 01-07	45.0	75.3	86.5	47.4	72.9	84.0
Slovenia 00-08	29.4	64.5	76.5	31.0	75.3	87.5
K						
Finland 02-07	26.1	53.5	67.4	na	na	na
France 99-04	52.1	85.3	92.4	49.7	81.1	89.7
Ireland 01-07	45.8	74.0	83.1	60.1	81.2	88.4
Slovenia 00-08	52.9	74.4	84.2	39.5	61.1	75.7
O						
Finland 02-07	m	36.0	52.2	na	na	na
France 99-04	39.3	68.4	81.2	39.1	77.6	88.4
Ireland 01-07	see H	see H	see H	see H	see H	see H
Slovenia 00-08	m	69.9	83.9	31.2	54.0	67.9
D (manuf)						
Finland 02-07	47.2	73.3	83.9	na	na	na
France 99-04	48.4	75.4	85.6	55.3	76.7	85.3
Ireland 01-07	59.4	83.4	90.8	60.5	80.7	87.9
Slovenia 00-08	39.2	66.2	78.3	38.9	64.9	77.1

Note: Own calculations based on national data sets for firms in all services sectors combined with a median of 10 or more employees over the sample period. Imports for Slovenia cover only goods but not services imports. na: not available, c: confidential, m: missing.



**Figure 7 Contribution of type of trader to overall trade**

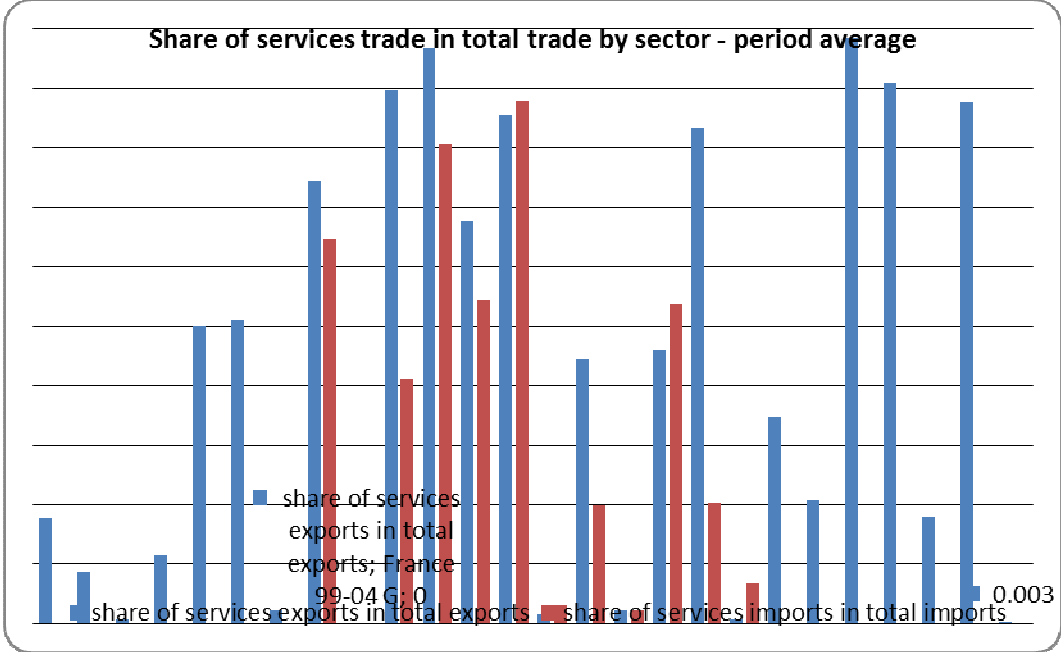


Note: Own calculations based on national data sets for firms in all services sectors combined with a median of 10 or more employees over the sample period. Imports for Slovenia cover only goods but not services imports.

### 3.4 What do firms trade?

In this section we investigate how important trade in services is in the services sectors, and we examine whether firms trade goods, services or both. We also look at the shares of services trade in total trade and turnover, and the concentration of trade in services.

**Figure 8** Share of services trade in total trade



Note: Own calculations based on national data sets for firms with a median of 10 or more employees over the sample period. Data for services trade in manufacturing in Ireland are available only from 2007 for exports and from 2006 for imports. Data for Slovenia cover 2000-2006 only because exports more than double between 2006 and 2007 after a change in the reporting requirements on the balance sheets.

Figure 8 shows the share of services trade in total trade by sector. Interestingly on average, firms in the services sectors export mostly goods. The shares of services exports in overall exports by services sector firms range from 18% in Finland to 42% in Ireland. France is an exception with services exports accounting for about three-quarters of overall exports by services sector firms. However, the French data do not include the wholesale and retail trade sector (G) which has only a small share of services exports in the other three countries. In France, Ireland and Slovenia exports of services account for 50% to well over 90% of overall exports in sectors H (hotels, bars and restaurants), I (transport, storage and communication) and O (other services). In Finland only sectors K (real estate, renting and business services) and O come close to 50%. In Slovenia, services account for some 35% of all services sector firms' exports, and in Ireland the figure is about 45%.

For services imports, data are available only for France and Ireland. In both countries the share of services imports in overall imports by services sector firms is lower than that of services exports in overall services exports by services sector firms. The shares are 65% for France and 20% for Ireland.

The relative importance of services imports in overall imports compared to the average across services sectors varies by country. In all countries services trade accounts for only a tiny proportion of overall trade in the manufacturing sectors both on the export and on the import side.

On the firm's side, Table 6 shows that although services exports are important in the services sectors, over 45% of firms only export goods. This is true even for France where the wholesale and retail trade sector – which accounts for as substantial fraction of goods trade among the services sectors - is not included in the services sector average. Most of the trade in goods is conducted by firms that both export and import. Firms that export only are more or equally likely to trade only services than to export both goods and services, for firms that export and import this varies by country.

Among importers, trade in goods only is even more prevalent with over 60% of firms involved in imports of goods only in all three countries. Firms that only import account for close to half of this, in Ireland the one-way traders even outnumber the two-way traders which trade only goods by a margin. Two-way traders account for higher shares of firms that import services only or goods and services than one-way traders. The relative importance of firms that import services only and those that import goods and services varies between one- and two-way traders and by country.

**Table 6 Share of traders by item traded - all services sectors, period average**

		Finland 03-07	France 99-04	Ireland 02-07	Slovenia 00-08
exporters					
exp only	only goods	25.0	21.8	9.4	4.5
	only services	2.1	13.9	9.6	14.5
	both	2.1	2.4	1.4	2.4
exp&imp	only goods	51.5	30.8	54.9	43.0
	only services	4.5	15.3	18.4	14.3
	both	14.8	15.8	6.4	21.3
importers					
imp only	only goods	39.7	28.9	47.2	na
	only services	2.2	8.4	3.3	na
	both	1.6	2.4	6.4	na
exp&imp	only goods	39.5	32.6	29.7	na
	only services	7.2	12.3	6.8	na
	both	9.8	15.5	6.7	na

Note: Own calculations based on national data sets for firms in all services sectors combined with a median of 10 or more employees over the sample period.

In the following we examine the determinants of firm's choices to trade only goods, only services or both. We follow a similar approach to that in Table 4 above.

We run probit regressions of the following form using the export side as an example (the regressions on imports are analogous):

$$Y_{it} = \text{Exp goods only}_{it-1} + \text{Exp servs only}_{it-1} + \text{Exp goods\&servs}_{it-1} + \text{size}_{it-1} + \text{foreign}_{it-1} + LP_{it-1} + \gamma_I + \gamma_t + \varepsilon_{it}$$

where  $Y_{it}$  denotes the export status of firm  $i$  at time  $t$ , namely Exp goods only, Exp servs only and Exp goods&servs. We control for differences in firm size, ownership, productivity ( $LP_{it}$ ) as well as 2-digit industry ( $\gamma_I$ ) and year ( $\gamma_t$ ) dummies. To capture differences in firm size, we use four firm size classes (10-19, 20-49, 50-249 and 250+), the smallest firms are the omitted category. Labour productivity ( $LP_{it}$ ) is defined as the log of sales in constant terms divided by the number of employees. As with the regressions in

Table 4 a multinomial model would have been more appropriate here as well and results are similar to those presented, however the IIA assumption is never satisfied. Again these regressions should be read as indications of correlations rather than as estimates of causality. The coefficients on Exp goods only, Exp servs only and Exp goods&servs should be interpreted relative to the omitted category which is firms that do not export.

Table 7 shows the results for the determinants of exporting goods/services or both and Table 8 the results for importing goods/services or both.

For exports Table 7 shows that the single most important determinant of whether a firm exports goods only, services only or goods and services is whether it had the same trading status in the previous year. There are few transitions between exporting goods only and exporting services only as indicated by the small and on occasion insignificant coefficients. There are transitions in both directions between exporting goods only and exporting goods and services as well as between exporting services only and exporting goods and services as indicated by the positive and significant coefficients. Larger firms are more likely to export goods and services in all countries. For some countries there is also a positive relationship between size and exporting goods only or exporting services only. Foreign ownership is positively associated with exporting services only and in two out of three countries also with exporting goods and services. Labour productivity is positively related to exporting goods only and to exporting goods and services.

For the determinants of importing goods only, importing services only and importing goods and services we have only information from three countries given the lack of information on services imports in Slovenia. For these countries, however the picture presented in Table 8 is very similar to that on the export side. For firm size there is an association with all three options, importing goods only, importing services only and importing goods and services, for Ireland this is the case only for

importing goods and services. Foreign ownership on the import side also plays a positive role for importing goods only.

**Table 7 Determinants of exporting goods, services or both – probit regressions**

	Finland			France			Ireland			Slovenia		
Probability of exporting goods only												
Exp goods only <sub>t-1</sub>	2.017	(0.032)	**	1.949	(0.019)	**	2.939	(0.052)	**	1.682	(0.048)	**
Exp servs only <sub>t-1</sub>	-0.236	(0.089)	**	-0.147	(0.041)	**	1.295	(0.089)	**	-0.059	(0.053)	
Exp goods&servs <sub>t-1</sub>	-0.018	(0.051)		0.647	(0.034)	**	1.313	(0.110)	**	0.518	(0.050)	**
size <sub>t-1</sub> (20-49)	0.126	(0.025)	**	0.135	(0.022)	**	0.083	(0.069)		0.097	(0.036)	**
size <sub>t-1</sub> (50-249)	0.063	(0.033)		0.265	(0.022)	**	0.040	(0.075)		0.123	(0.047)	**
size <sub>t-1</sub> (250+)	0.197	(0.057)		0.314	(0.031)	**	0.064	(0.109)		0.161	(0.094)	+
fo <sub>t-1</sub>	0.051	(0.033)					0.000	(0.062)		-0.091	(0.048)	+
LP <sub>t-1</sub>	0.148	(0.014)	**	0.170	(0.009)	**	0.078	(0.026)	**	0.166	(0.019)	**
Obs /Firms	36657	9059		85676	28864		15844	6117		17370	2644	
LogL	-9680.0			-14689.0			-1826.0			-5745.7		
Probability of exporting services only												
Exp goods only <sub>t-1</sub>	-0.231	(0.082)	**	-0.229	(0.041)	**	1.425	(0.095)	**	-0.069	(0.052)	
Exp servs only <sub>t-1</sub>	1.812	(0.079)	**	1.681	(0.034)	**	2.932	(0.074)	**	1.455	(0.052)	**
Exp goods&servs <sub>t-1</sub>	0.779	(0.068)	**	0.662	(0.040)	**	1.317	(0.135)	**	0.484	(0.055)	**
size <sub>t-1</sub> (20-49)	0.319	(0.060)	**	0.171	(0.029)	**	-0.165	(0.086)	+	-0.077	(0.045)	+
size <sub>t-1</sub> (50-249)	0.381	(0.068)	**	0.387	(0.030)	**	-0.149	(0.092)		-0.105	(0.058)	+
size <sub>t-1</sub> (250+)	0.236	(0.109)	*	0.565	(0.041)	**	-0.042	(0.118)		-0.022	(0.113)	
fo <sub>t-1</sub>	0.231	(0.061)	**				0.184	(0.072)	*	0.240	(0.062)	**
LP <sub>t-1</sub>	0.049	(0.026)	+	0.278	(0.012)	**	-0.019	(0.031)		-0.026	(0.021)	
Obs /Firms	36657	9059		85676	28864		15844	6117		17370	2644	
LogL	-2062.6			-10668.9			-1103.3			-5311.3		
Probability of exporting goods&services												
Exp goods only <sub>t-1</sub>	0.919	(0.060)	**	1.132	(0.038)	**	0.928	(0.142)	**	1.061	(0.056)	**
Exp servs only <sub>t-1</sub>	1.618	(0.073)	**	1.146	(0.043)	**	1.127	(0.168)	**	0.968	(0.060)	**
Exp goods&servs <sub>t-1</sub>	3.042	(0.061)	**	2.480	(0.042)	**	3.152	(0.151)	**	2.289	(0.064)	**
size <sub>t-1</sub> (20-49)	0.313	(0.054)	**	0.180	(0.043)	**	0.071	(0.152)		0.045	(0.036)	
size <sub>t-1</sub> (50-249)	0.614	(0.056)	**	0.449	(0.043)	**	0.174	(0.158)		0.212	(0.045)	**
size <sub>t-1</sub> (250+)	1.009	(0.077)	**	0.841	(0.052)	**	-0.032	(0.227)		0.482	(0.085)	**
fo <sub>t-1</sub>	0.279	(0.045)	**				-0.098	(0.116)		0.105	(0.043)	*
LP <sub>t-1</sub>	0.130	(0.023)	**	0.234	(0.015)	**	0.086	(0.049)	+	0.227	(0.020)	**
Obs /Firms	36657	9059		85676	28864		15844	6117		17370	2644	
LogL	-2443.4			-5621.4			-522.4			-4650.8		

Note: Regressions for firms in all services sectors combined with a median of 10 or more employees over the sample period. Marginal effects and standard errors reported in parenthesis. All regressions include 2-digit industry and year dummies. \*\*, \* and + represent significance at 1, 5 and 10% respectively

**Table 8 Determinants of imports of goods, services or both – probit regressions**

	Finland			France			Ireland		
Probability of importing goods only									
Imp goods only <sub>t-1</sub>	2.369	(0.024)	**	2.005	(0.018)	**	2.798	(0.039)	**
Imp servs only <sub>t-1</sub>	-0.418	(0.094)	**	-0.013	(0.043)		1.235	(0.078)	**
Imp goods&servs <sub>t-1</sub>	0.149	(0.051)	**	0.670	(0.033)	**	1.245	(0.063)	**
size <sub>t-1</sub> (20-49)	0.108	(0.024)	**	0.182	(0.021)	**	-0.008	(0.049)	
size <sub>t-1</sub> (50-249)	0.147	(0.031)	**	0.358	(0.022)	**	-0.029	(0.054)	
size <sub>t-1</sub> (250+)	0.182	(0.054)	**	0.444	(0.029)	**	0.103	(0.080)	
fo <sub>t-1</sub>	-0.044	(0.035)					-0.107	(0.051)	*
LP <sub>t-1</sub>	0.050	(0.013)	**	0.175	(0.009)	**	-0.027	(0.022)	
Obs /Firms	36657	9059		85676	28864		15844	6117	
LogL	-8882.7			-16627.2			-3357.0		
Probability of importing services only									
Imp goods only <sub>t-1</sub>	-0.496	(0.095)	**	-0.081	(0.041)	*	0.860	(0.074)	**
Imp servs only <sub>t-1</sub>	2.097	(0.064)	**	1.660	(0.040)	**	2.589	(0.076)	**
Imp goods&servs <sub>t-1</sub>	0.580	(0.079)	**	0.752	(0.043)	**	0.774	(0.097)	**
size <sub>t-1</sub> (20-49)	0.524	(0.061)	**	0.209	(0.034)	**	-0.004	(0.081)	
size <sub>t-1</sub> (50-249)	0.772	(0.069)	**	0.394	(0.036)	**	-0.053	(0.087)	
size <sub>t-1</sub> (250+)	0.880	(0.100)	**	0.542	(0.048)	**	-0.059	(0.117)	
fo <sub>t-1</sub>	0.238	(0.058)	**				0.119	(0.068)	+
LP <sub>t-1</sub>	0.164	(0.024)	**	0.288	(0.014)	**	0.080	(0.030)	**
Obs /Firms	36657	9059		85676	28864		15844	6117	
LogL	-2359.2			-8421.0			-1278.9		
Probability of importing goods&services									
Imp goods only <sub>t-1</sub>	0.791	(0.072)	**	1.035	(0.037)	**	1.143	(0.077)	**
Imp servs only <sub>t-1</sub>	1.011	(0.084)	**	1.237	(0.044)	**	1.134	(0.109)	**
Imp goods&servs <sub>t-1</sub>	2.935	(0.076)	**	2.477	(0.041)	**	2.896	(0.077)	**
size <sub>t-1</sub> (20-49)	0.288	(0.056)	**	0.149	(0.047)	**	0.255	(0.088)	**
size <sub>t-1</sub> (50-249)	0.589	(0.057)	**	0.487	(0.045)	**	0.356	(0.091)	**
size <sub>t-1</sub> (250+)	1.010	(0.075)	**	0.913	(0.051)	**	0.385	(0.116)	**
fo <sub>t-1</sub>	0.443	(0.043)	**				0.189	(0.064)	**
LP <sub>t-1</sub>	0.160	(0.023)	**	0.271	(0.014)	**	-0.004	(0.029)	
Obs /Firms	36657	9059		85676	28864		15844	6117	
LogL	-2304.3			-5245.2			-1708.9		

Note: Regressions for firms in all services sectors combined with a median of 10 or more employees over the sample period. Marginal effects and standard errors reported in parenthesis. All regressions include 2-digit industry and year dummies. \*\*, \* and + represent significance at 1, 5 and 10% respectively

### **Diversification of services trade by services sector firms**

A number of recent papers have used customs data on goods trade to show that most exporters trade with only one country and only very few firms trade with many countries, similarly most firms trade only one product and very few firms trade many products (e.g. Andersson, Lööf and Johansson (2008) for Sweden, Muûls and Pisu (2009) for Belgium, Castellani, Serti and Tomasi (2010) for Italy, and Eaton, Kortum and Kramarz (2011) for France). Typically this literature also shows that those firms trading many products with many countries account for large shares of overall trade values. For services trade in general Breinlich and Criscuolo (2011), Gaulier, Milet and Mirza (2011) and Kelle and Kleinert (2010) have shown that similar observations are true for the UK, France and Germany, respectively. Here we show specifically what these relationships are for services trade by services sector firms.

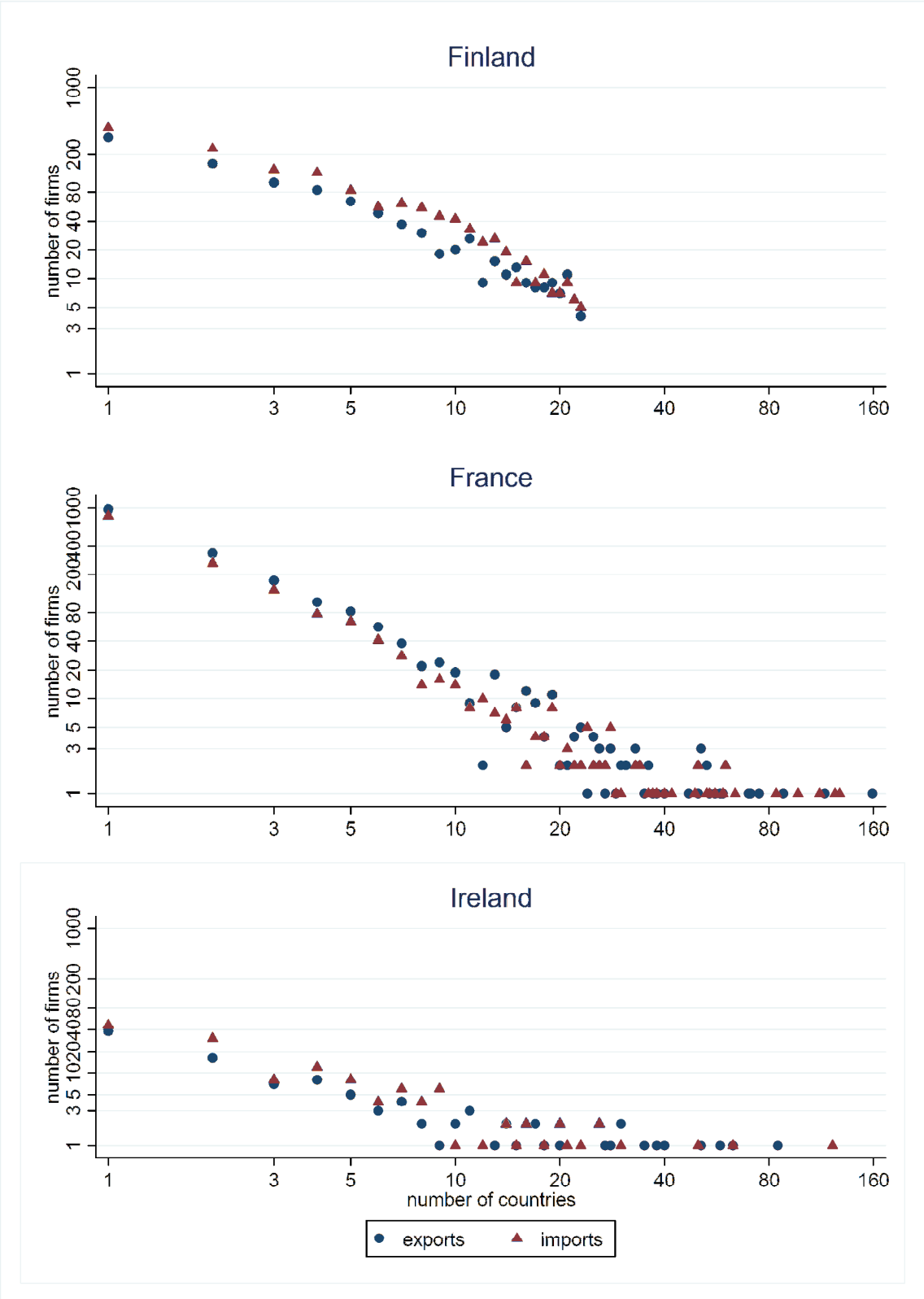
From Figure 9 the negative relationship between the number of firms and the number of markets served described in earlier research is clearly evident. From this figure also differences in the size of the countries examined are evident: France with an overall larger number of firms also has somewhat more weight in the centre of the distribution, i.e. there are more firms serving a relatively large number of markets. For Finland it is interesting to see that the maximum number of markets served with services exports is less than 30 in comparison to well over 100 in both France and Ireland.<sup>11</sup>

Figure 10 illustrates the negative relationship between the number of firms and the number of services sold. Here it is interesting to note that the marks for imports lie above those for exports for more than 4 services traded indicating that services traders are more likely to import a number of different services than to export a large number of services. This might reflect a greater degree of specialisation on the export side. See the Appendix for a description of the types of services included in each country.

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<sup>11</sup> Note the maximum number of markets served for Finnish services exports does not exceed 60 in any year between 2004 and 2007. This is not an artefact of excluding the observations that pertain to one or two firms to preserve confidentiality.

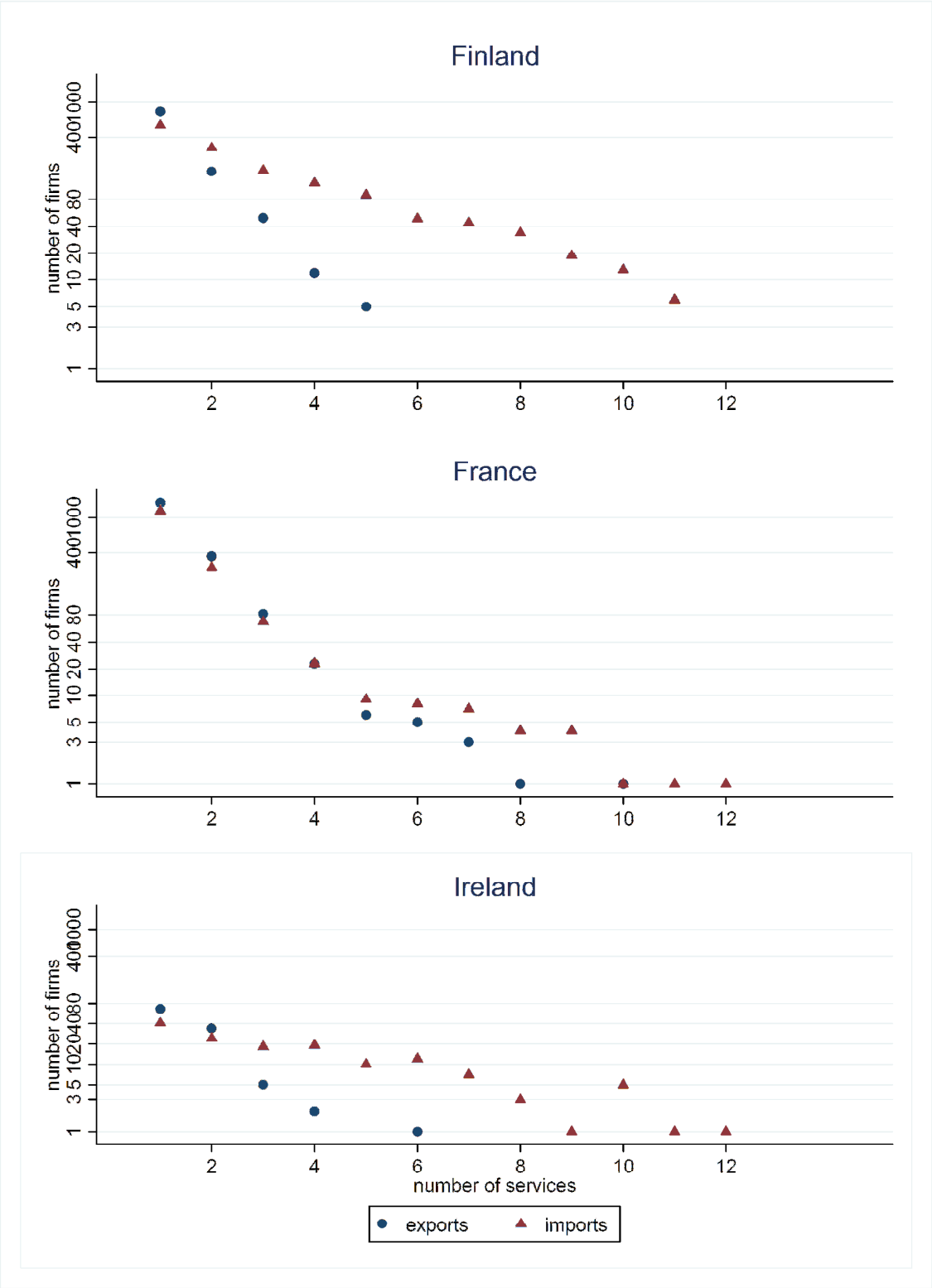
**Figure 9 Market concentration: Number of firms per export/import market, services trade in the services sectors, 2004**



Note: Own calculations based on national data sets for firms in all services sectors combined with a median of 10 or more employees over the sample period (supplied by the CSO for Ireland). For Finland markets pertaining to only 1 or 2 firms had to be blanked to preserve confidentiality.



**Figure 10 Concentration of services trade across firms: Number of services exported/imported by number of firms, all services sectors, 2004**



Note: Own calculations based on national data sets for firms in all services sectors combined with a median of 10 or more employees over the sample period (supplied by the CSO for Ireland). For Finland markets pertaining to only 1 or 2 firms had to be blanked to preserve confidentiality.

**Table 9 Distribution of firms and export volumes across export destination and services exported, all services sectors, 2004**

Number of exporters					Export value				
Finland									
Number of countries					Number of countries				
Number of services	1	2-4	5+	Total	Number of services	1	2-4	5+	Total
1	39.0	13.3	21.0	73.3	1	26.0	3.9	26.6	56.4
2	c	c	7.9	15.9	2	0.3	2.5	15.0	17.8
3+	c	c	9.2	10.8	3+	0.0	0.2	25.6	25.7
Total	41.9	20.0	38.1	100.0	Total	26.3	6.6	67.1	100.0
France									
Number of countries					Number of countries				
Number of services	1	2-4	5+	Total	Number of services	1	2-4	5+	Total
1	35.6	21.8	7.2	64.6	1	1.3	4.5	10.9	16.6
2	3.1	15.7	11.4	30.2	2	1.5	1.9	21.8	25.2
3+	0.0	0.8	4.4	5.2	3+	0.0	0.4	57.8	58.2
Total	38.7	38.2	23.1	100.0	Total	2.8	6.7	90.5	100.0
Ireland									
Number of countries					Number of countries				
Number of services	1	2-4	5+	Total	Number of services	1	2-4	5+	Total
1	30.6	19.4	11.1	61.1	1	4.5	2.3	13.8	20.6
2	4.6	7.4	19.4	31.5	2	0.5	2.4	72.2	75.2
3+	0.0	1.9	5.6	7.4	3+	0.0	0.1	4.2	4.2
Total	35.2	28.7	36.1	100.0	Total	5.1	4.7	90.2	100.0

Note: Own calculations based on national data sets for firms in all services sectors combined with a median of 10 or more employees over the sample period (supplied by the CSO for Ireland). Read, e.g. exporter table for France in 2004: 35.6% of firms exported one service to one country. Read, e.g. export value table for France in 2004: exporters that exported one service to one country accounted for 1.25% of total export value. c = confidential.

Table 8 shows the distribution of exporters and export volumes across export destinations and service products exported for all services sectors in 2004. In all three countries over 60% of firms export only one type of service, whereas less than 10% of exporters sell three or more services. The firms that export only one service account for proportionately much smaller shares of overall export value – in France and Ireland around 20% or less, in Finland for a more substantial 56%. In France, firms that export three or more services account for the largest share of export value at 58%; in Ireland it is the firms that export two services which account for the largest share of export value. It is striking to note that in France the 4.4% of firms that export three or more services to five or more countries account for 57.8% of overall export value. While a degree of concentration similar to that for France is also observed in services by Breinlich and Criscuolo (2011) for the UK as well as in studies of goods trade (e.g. Bernard et al. (2007)), the data for Ireland and Finland shown here somewhat contradict this

picture. Country size may play a role in explaining these differences; however, with the information available to us we are unable to investigate this in more detail.

The shares of firms that export to 1, 2-4 or 5 or more countries are more evenly distributed ranging from 20-42% in all three countries. In line with earlier evidence for services and goods trade, the largest shares of total services export value – from over two thirds to 90% – are accounted for by those exporters that serve five or more countries. Finally, it may be worth noting that the entries in the fields below the main diagonal in the two matrices in all three countries are small, indicating that there is a positive relationship between the number of services exported and the number of countries served for both the share of firms involved and the share in overall export value.

#### **4. Summary and discussion**

In this paper we compare the patterns of trade of firms in five market services sectors and the manufacturing sector using official firm- and service level data from four rather different EU countries, namely Finland, France, Ireland and Slovenia. Despite the differences between countries we are able to establish a number of regularities which overall suggest that trade by firms in the services sectors is not too dissimilar from trade by manufacturing firms; there are some caveats to this observation, however.

First, in the light of trade in services on the rise worldwide it is perhaps not so surprising that over similar periods in first decade of the 21<sup>st</sup> century in all countries except Ireland exports and imports of services firms grew faster than exports and imports of manufacturing firms. Trade by services sector firms also grew faster than overall sales by these firms (again in Ireland the opposite was true). Given that the share of overall exports in overall sales in the services sectors is only a small fraction of the same share in manufacturing this may reflect catching-up growth to a degree, but more likely perhaps that the spread of modern communication technologies has made it easier to trade services. Interestingly, on the import side the differences in the share of overall imports in overall sales between services and manufacturing are not so large (except in France).

These differences between aggregate figures are a reflection of the underlying market structure, that is the number of firms engaged in trade and their average trade intensity (share of exports/imports in sales). Our analysis shows that on average across services sectors 15-25% of firms export and 15-32% of firms import, only in Slovenia do these figures exceed 50%. In all countries, however, the shares of traders in services are substantially lower than in manufacturing where 60-80% of firms are engaged in trade. The only services sector that comes close to the manufacturing shares is wholesale and retail trade, especially on the import side. The average shares of exports or imports in sales across firms in all services sectors taken together also tend to be smaller than those of manufacturing firms; however,

in some individual services sectors the opposite is true. Sectors G (wholesale and retail trade), I (transport, storage and communication) and K (real estate, renting and business services) are candidates, but this differs by country. The share of traders in the services sectors is higher among multinational firms and it increases with firm size, whereas the average export/import intensity decreases with firm size.

As in manufacturing most trading firms both export and import, but one-way traders that is firms that export only or import only are more important in the services sectors than in manufacturing. This applies to their contribution to aggregate trade which exceeds 30% in some sectors and countries (for comparison it is less than 2% in all countries in manufacturing) as well as to their relative share in the number of traders and their trade intensities (except for their import intensities in France). Exports are perhaps marginally less concentrated in the hands of the largest traders (top 1-10% of exporters) in the services sectors than they are in manufacturing in all countries but France. On the import side, these differences vary by country.

The majority of firms in the services sectors trades goods, but trade in services accounts for a sizeable proportion of overall trade in the services sectors. This indicates that on average the services traded are of much higher value than the goods. In all services sectors taken together the share of services in overall trade exceeds that in manufacturing by a large margin. In individual services sectors services trade accounts for 70 to nearly 100%, sectors where this is the case vary by country, however.

Results from probit regressions indicate that as in manufacturing trading status is highly persistent. This is true in terms of whether a firm exports only, imports only or both exports and imports as well as whether a firm exports/imports goods, services or both. Past trading status is always the strongest predictor of current trading status. Firm characteristics such as size and productivity are correlated with trading status, most strongly with engaging in both exports&imports and with exporting or importing both goods and services.

Finally, for exports of services we show that similar to trade in goods, there is a negative relationship between the number of firms involved and the number of markets served as well as between the number of firms involved and the number of services traded. We further illustrate that the 23-38% of firms trading with five or more countries account for 67-90% of overall export value. In terms of the number of services traded 61-73% of firms export only one service, these firms account for between 17 and 56% of overall services value. We observe the case where a large share of export value is generated by a small share of exporters which export many services to many countries that is familiar from goods trade only in one country, namely France. In Ireland and Finland firms that export to many countries also account for a large share of services exports, but the same is not true for the number of services exported.

Hence traders in the services sector appear to be heterogeneous in their characteristics, at least as much as in manufacturing. Besides, not only do they trade services but a significant proportion of their trade is in goods too. This is in contrast to traders in the manufacturing sector which trade mostly goods. Hence, an increase in trade liberalization either specific to goods (e.g. via a reduction in transport costs) or services (e.g. a reduction in telecommunication costs) should impact the services sector in much the same way as suggested by the most recent developments in trade theory (e.g. Melitz (2003)), that is by reallocating resources towards more efficient firms and driving less efficient ones out of the market. Thus, we would expect aggregate gains from trade in the services sectors as a result of further trade liberalisation. However, economic policies should be concerned about easing the adjustment to trade liberalization in these sectors which many policymakers still think of as being isolated from trade.

## Literature

Andersson, Martin, Hans Lööf and Sara Johansson (2008) "Productivity and international trade: Firm level evidence from a small open economy." *Review of World Economics (Weltwirtschaftliches Archiv)* 144(4), 774-801

Bernard, Andrew B. and J. Bradford Jensen (1995) "Exporters, jobs and wages in US manufacturing: 1976-1987." *Brookings Papers on Economic Activity, Microeconomics*, 67-119.

Bernard, Andrew B. and J. Bradford Jensen (1999) "Exceptional exporter performance: cause, effect, or both?" *Journal of International Economics* 47, 1-25

Bernard, Andrew B., J. Bradford Jensen, Stephen Redding and Peter K. Schott (2007) "Firms in International Trade." *Journal of Economic Perspectives* 21(3), 105-130.

Bernard, Andrew B., J. Bradford Jensen, Stephen J. Redding and Peter K. Schott (2010) "Wholesalers and Retailers in U.S. Trade (Long Version)," NBER Working Papers 15660, National Bureau of Economic Research.

Breinlich, Holger and Chiara Criscuolo (2011), "International Trade in Services: A Portrait of Importers and Exporters," *Journal of International Economics* 84(2), 188-206

Castellani, Davide, Francesco Serti, and Chiara Tomasi (2010) "Firms in international trade: Importers' and exporters' heterogeneity in Italian manufacturing industry." *The World Economy* 33(3), 424-457

Eaton, Jonathan, Samuel Kortum and Francis Kramarz (2011) "An anatomy of international trade: Evidence from French firms." *Econometrica* 79(5), 1453-1498

Federico Stefano and Enrico Tosti (2012) "Exporters and Importers of Services: Firm-level Evidence on Italy," mimeo.

Gaulier, Guillaume, Emmanuel Milet and Daniel Mirza (2011) "Les Firmes Françaises dans le commerce de Services," *Economie et Statistique* 435-436, 125-147

Greenaway, David and Richard Kneller (2007) "Firm heterogeneity, exporting and foreign direct investment." *Economic Journal* 117(517), F134-F161

Grublješič, Tanja and Jože Damijan (2011), "Differences in Export Behavior of Services and Manufacturing Firms in Slovenia." *Economic and Business Review* 13(1-2): 77-105

ISGEP International Study Group on Exports and Productivity (2008) "Understanding cross-country differences in exporter premia: Comparable evidence for 14 countries." *Review of World Economics (Weltwirtschaftliches Archiv)* 144(4), 596-635

Kelle, Markus and Jörn Kleinert (2010) "German firms in service trade," Economics Working Papers 2010/03, Christian-Albrechts-University of Kiel, Department of Economics.

Kox, Henk and Hugo Rojas-Romagosa (2010) "Exports and productivity selection effects for Dutch firms," *De Economist* 158, 295-322.

Mayer, Thierry and Gianmarco Ottaviano (2008) "The Happy Few: The Internationalization of European Firms," *Review of European Economic Policy* 43(3), 135-148

Melitz, Marc J. (2003) “The impact of trade on intra-industry reallocations and aggregate industry productivity.” *Econometrica* 71(6), 1695-1725

Muûls, Mirabelle and Mauro Pisu (2009) “Imports and exports at the level of the firm: Evidence from Belgium.” *The World Economy* 32(5), 692-734

Wagner, Joachim (2007) “Exports and productivity: A survey of the evidence from firm-level data.” *The World Economy* 30(1), 60-82

Wagner, Joachim (2012) “International Trade and Firm Performance: A Survey of Empirical Studies since 2006,” *Review of World Economics (Weltwirtschaftliches Archiv)* 148(2), 235-267

## Appendix

Types of services included in Figure 9, Figure 10 and Table 9

### France

Communication services	Telecommunication and post
Construction Services	Foreign merchandise designated for major works Major works
Insurance services	Insurance on merchandises bonus and service charge bonuses; bonuses; other insurance: bonus and service charges Reinsurance
Financial Services	Service charge and banking or financial charges from banking sector Service charge and banking or financial charges from nonbanking and private sector
Computer and Information Services	Computer Services
Royalties and Licences, Patents	Royalties on Patents, trade in know-how sales of licences, property rights, author's rights
Other Business Services	
Leasing	Leasing of mobile and immobile goods (other than ships)
Direct Business Services	Studies, Research and Technical Assistance overheads Other labour remuneration Subscriptions, advertising
Personal services, cultural services	
Audiovisual services	Audiovisual

### Finland

Transport services freight charges
Postal and courier services
Telecommunications services
Construction abroad
Construction in Finland
Financial intermediation services
Computer services
Information services
Royalty and license fees
Merchanting services and other trade-related services
Operational leasing
Legal services, accounting, auditing, bookkeeping, business and management consultancy and public relations services
Advertising, market research and public opinion polling
Research and development services
Architectural, engineering and other technical services
Agricultural services, mining services and on-site processing services



Other business services  
Services between related enterprises not included elsewhere  
Audiovisual and related services  
Other personal, cultural and recreational services  
Other unspecified services

## Ireland

Communications (postal, courier, telecommunications)  
Computer services  
    (a) Licences  
    (b) Other  
Information Services  
Professional and consultancy services (legal, accounting, auditing, tax advice, etc.)  
Architectural, engineering and other technical services  
Advertising, market research, public relations  
Financial services  
Operating lease rentals  
Insurance services  
Research and development  
Agricultural and mining and exploration services  
Repairs  
Processing  
Agents' fees, commissions etc.  
Merchanting / drop shipping  
Management fees between related companies  
Miscellaneous services  
Royalties, licences (excluding computer), copyrights, etc.

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