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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- and activity-level 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. This is because fewer firms are

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engaged in trade in the services sectors and also because within particular sectors firms trade a lower share of their sales on average. Services producers trade mostly goods, but in terms of value, trade in services is much more important to them than to manufacturers. Larger and more productive firms are more likely to be two-way traders and to engage in both goods and services trade. Trade by services firms is somewhat less dominated by firms that both export and import than trade by manufacturing firms. Few firms export many services or to many countries. The value of services exports is increasing in the number of markets served but not necessarily in the number of services traded.

Keywords Exports · Imports · Services · International comparison

JEL Classification F14 · D22 · L80

1 Introduction

Trade is an important link for economies and firms to stay in touch with global developments in technology and organisation. Much of the existing evidence on trade and trading firms has been obtained from data on manufacturing firms and on trade in goods. In 2008 over two thirds (69 %) of global value added was generated in services (World Bank 2010). Likewise trade in services has increased substantially since the mid-1990s.[1] This is noteworthy since many services cannot travel across borders unaccompanied in the same way goods can, but instead require the producer and consumer to be in the same physical location for an exchange to take place. While services are mostly traded by service producers, they also accompany the delivery of goods by manufacturing firms. Equally many service producers also trade goods.

With this paper our first aim is to document the patterns of trade and the characteristics of trading firms in the services sectors. Our analysis covers firms in five market services sectors, namely wholesale and retail trade; hotels, bars and restaurants; transport, storage and communication; real estate, renting and business activities; other community, social and personal service activities as well as all of these sectors taken together. We look at both exports and imports. In particular, we study which services firms trade, how important exports and imports are relative to their sales, whether they trade mostly goods or services and the relative values of these activities. We compare the patterns observed for firms in the services sectors to those of firms in manufacturing. In line with the recent literature on heterogeneous firms, we also document differences between trading firms in the

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[1] According to data provided by UNCTAD (UNCTADstat 2013), the value of total services exports by the EU countries grew by 104 % in 2000–2006, while the total exports of goods grew by 85 %. Exports of services continued to grow faster than exports of goods also after 2006. Meanwhile, in just over a decade the ratio of world services exports to world GDP has increased from 4.1 % in 1995 to 6.2 % in 2008. This is a small fraction compared to world merchandise exports (25 % of world GDP) but still an impressive development. At a global level, exports of goods and services have been growing at the same speed since 1990. The EU countries have therefore clearly been specialising in services which underlines the importance of services for the future development of the EU.

services sectors in terms of their contribution to overall trade and their degree of involvement in international trade as measured by the number of services traded and the number of markets served.

Second, in order to make the results for trading firms from the services sectors more convincing, this paper uses a unique set of datasets 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 levels 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 % in 2007–2011) with a large presence of foreign multinational firms.

Much of the evidence to date on the margins of trade is based on firm-level data for manufacturing industries. Bernard and Jensen (1995) were first to establish that larger, more productive, more capital and skill-intensive firms are more likely to become exporters. More recently this literature has been extended to include importers, Greenaway and Kneller (2007) and Wagner (2007, 2012) provide surveys. From customs data on trade in goods we have learned that very few firms trade many products with many countries (e.g. Bernard et al. 2007; Mayer and Ottaviano 2008; Castellani et al. 2010; Eaton et al. 2011; Amador and Opromolla 2013).

For firms that trade services the following papers have documented similar patterns: Breinlich and Criscuolo (2011) for the UK, Gaulier et al. (2010) for France, Kelle and Kleinert (2010) for Germany, and Federico and Tosti (2012) for Italy. Like these papers we also provide evidence on trade in services across different sectors of the economy, but we also document the extent of trade in goods by service producers. Comparisons of the performance of exporters in the manufacturing and the services sectors have been carried out by Kox and Rojas-Romagosa (2010) for the Netherlands and by Grublješič and Damijan (2011) for Slovenia. Temouri et al. (2013) examine the performance of exporters in the business services sector in Germany, France and the UK. Like these papers we look at exporters, but also extend our analysis to include importers. As mentioned above our analysis covers five market services sectors. We also compare results for firms in services and manufacturing sectors.

Despite differences in country characteristics our analysis shows a number of similar patterns for trade and trading firms in the services sectors. Some of these patterns are familiar from the evidence on manufacturing and trade in goods, but we note several important differences. First, exports and imports of services firms grew faster than exports and imports of manufacturing firms over similar periods in the first decade of the twenty-first century. Second, exports account for a much lower share of overall sales in services sectors than in manufacturing. This is largely because fewer firms engage in trade and in individual services sectors also because they trade a lower share of their sales on average. Third, while most firms in the services sectors trade goods, trade in services accounts for most of the value of exports and imports in the services sectors. Fourth, larger and more productive

services firms are more likely to be involved in trade, in particular they are more likely to both export and import and to trade both goods and services. Fifth, trade is highly concentrated in the hands of a few large traders, but one-way traders play a bigger role than in manufacturing. Sixth, few firms export many services, and few firms export to many countries. The value of services exports is increasing in the number of markets served but not necessarily in the number of services traded.

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. Section 5 briefly concludes.

2 Data

We use unique datasets from the official agencies entrusted with data collection in each country. Our datasets span overlapping but not fully identical periods in the first decade of the twenty-first century. By merging different datasets depending on the country, we are able to identify the type of trade firms are engaged in—goods and/or services—and its value. We also have information on industry classification, ownership, sales, employment and capital stocks. A detailed description of each country's data sources is provided below. Table 1 offers a summary of the sectors covered in each country. We did not have access to activity data (i.e. trade in services and trade in goods) for wholesale and retail trade in France. Besides, there are some differences among the countries in coverage at the 2-digit level.

2.1 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.[2] It includes around 50,000 services sector firms per year over a period of 6 years (2002–2007). The dataset on International Trade in Services[3] 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 dataset 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.

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[2] The manufacture of radio, television and communication equipment and apparatus (NACE 32) was removed for confidentiality reasons.

[3] See 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.

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[a]	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	15–31, 33–37	15–37	15–37	15–37

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

[a] Information on activity (employment, turnover, etc.) for the wholesale and retail trade sector is not available to us for France

2.2 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[4]) across 150 countries. Second, we match this dataset with firm-level data on trade in goods from the French Customs. Trade flows from customs 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, excluding the wholesale and retail trade sector. 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 sectors 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.

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[4] 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).

2.3 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.[5] 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 three or more persons engaged in mining, manufacturing and utilities. Information on services imports has been collected since 2006; information on services exports only since 2007.

In order to complete the picture for Ireland, CSO agreed to provide information based on two further surveys.[6] The data underlying Figs. 6 and 7 and Table 9 are based on the Survey of International Trade in Services and 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. 1.1 divisions 65–67), 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 five NACE sectors that we study (see Table 1).

2.4 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

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[5] 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 dataset on the premises of the CSO is provided for in the Statistics Act 1993.

[6] We are grateful to Stephen McDonagh of the CSO for extracting this information.

exports recorded by the Customs Office for firms in the data correspond to about 17 % of the volume of services exports as recorded in the 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 persons engaged in Ireland and 30 employees in France, and for small and medium-sized firms in Finland.

In Table 2 we show the average number of firms per year for all services sectors and for five firm 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 lack of information on the wholesale and retail trade sector (G) for France.

3 Descriptive analysis

3.1 How important is trading activity 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 for this metric over time is evident only in France and Slovenia, but the increases in these two countries are moderate at 0.8 and 4.4 % over the entire period for each country respectively. In the manufacturing sector the changes were 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.[7] In manufacturing

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[7] 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 2 Average number of firms per year by sector and firm size class

No. of employees	1–9	10–19	20–49	50–249	250+	Total	Sample 10+
Finland 2002–2007							
All services	42,486	4,120	2,368	1,096	264	50,334	7,848
G	15,426	1,750	907	379	111	18,573	3,147
H	4,281	351	189	70	15	4,906	625
I	7,355	641	312	159	55	8,522	1,167
K	12,981	1,190	850	443	74	15,538	2,557
O	2,443	188	110	45	9	2,795	352
D (manufacturing)[a]	7,728	1,469	1,256	894	219	11,566	3,838
France 1999–2004							
All services[b]	31,885	6,385	7,624	4,994	1,347	52,235	20,350
G	na	na	na	na	na	na	na
H	7,264	1,388	1,841	662	120	11,275	4,011
I	781	223	203	107	48	1,362	581
K	20,031	4,092	4,945	3,855	1,090	34,013	13,982
O	3,809	682	635	370	89	5,585	1,776
D (manufacturing)	151	565	12,187	8,729	2,357	23,989	23,838
Ireland 2001–2007							
All services	4,370	1,871	2,249	1,161	193	9,844	5,474
G	1,813	858	988	435	65	4,159	2,346
H	597	337	508	326	22	1,790	1,193
I	318	129	156	76	25	704	386
K	1,284	411	447	259	70	2,471	1,187
O	358	136	150	65	11	720	362
D (manufacturing)	1,895	913	918	701	173	4,600	2,705
Slovenia 2000–2008							
Services	16,403	1,324	790	395	71	18,983	2,580
G	7,474	609	348	161	26	8,618	1,144
H	948	104	65	36	11	1,164	216
I	1,345	116	89	60	18	1,628	283
K	6,051	440	255	109	13	6,868	817
O	585	55	33	29	3	705	120
D (manufacturing)	3,329	541	527	568	173	5,138	1,809

G wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods, *H* hotels, bars and restaurants, *I* transport, storage and communication, *K* real estate, renting and business activities, *O* other community, social and personal service activities. Own calculations based on national datasets. na = not available

[a] Excluding NACE 32

[b] Excluding sector G

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		
	Avg.	Change last-first year	Avg.	Change last-first year	Exports	Imports	Sales
All services							
Finland 2002–2007	7.3	−0.2	na	na	3.6	na	2.7
France 1999–2004[a]	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[b]	5.6	4.4	25.6	6.8	15.8	6.3	1.6
G							
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[b]	4.6	4.1	32.9	9.0	17.8	6.5	1.7
H							
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[b]	2.6	−1.5	0.8	0.0	−9.7	8.4	0.1
I							
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[b]	5.9	1.1	5.8	−2.5	5.4	−3.1	1.2
K							
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[b]	12.4	15.9	13.3	6.5	28.6	10.2	1.6
O							
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[b]	7.3	−8.2	2.9	0.5	−15.2	18.3	3.7
HIO							
Ireland 2001–2007	20.5	−8.0	13.0	−5.1	−4.0	−3.6	2.0
D (manufacturing)							
Finland 2002–2007[c]	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[b]	49.7	10.7	29.9	5.3	5.9	5.3	2.1

Own calculations based on national datasets for firms with a median of 10 or more employees over the sample period. For Ireland, sectors H, I and O had to be combined due to confidentiality reasons

G wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods, *H* hotels, bars and restaurants, *I* transport, storage and communication, *K* real estate, renting and business activities, *O* other community, social and personal service activities. na = not available

[a] Excluding sector G

[b] 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

[c] Excluding NACE 32

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.

The comparison for imports is more difficult since there are no data for Finland and for Slovenia we only have information on imports of goods. 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. Considering average annual 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.

Comparing individual services sectors we find that shares of both exports and imports in sector H (hotels and restaurants) are very low. This reflects 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 either not at all or 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 highest in the wholesale and retail trade sector based on only Ireland and Slovenia. 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.

3.2 Which firms trade goods and services and how much do they trade?

This section describes trade participation (extensive margin) and trade intensities (intensive margin) by sector, firm size and ownership. Figure 1 shows trade participation and trade intensities by sector. In Fig. 2 we show the extensive and intensive margin of trade for the firms in the services sectors by firm size, and in Fig. 3 by owner. Looking at the two panels to the left in Fig. 1 we can see that the lower shares of trade in turnover in the services sectors documented in Table 3 are mostly the result of lower trade participation in the services sectors. Typically no more than a third of the firms in the services sectors are importers or exporters compared to 60 % or more among manufacturing firms. Slovenia is an exception with more than 50 % of its firms in the services sectors being exporters or importers compared to roughly 80 % of its manufacturing firms. The two panels to the right in Fig. 1 show average trade intensities, that is the share of exports or imports in turnover. These are not much lower in the services sectors compared to manufacturing for exports. On the import side, average import intensities in the services sectors are higher than in manufacturing. For exports there appears to be

something like an inverse relationship between trade participation and trade intensities: In countries with a relatively high share of exporters, their share of export revenue in turnover tends to be relatively lower. France looks like an exception with both a small number of exporters and low average export intensities. This could be due to the lack of information for wholesale and retail trade (G) in the French data.

Note also that there are more importers than there are exporters across most sectors and countries. This is the case both in services and in manufacturing. Sector K (real estate, renting and business services) is the only sector where exporters outnumber importers in all countries. The shares of exporters are above the average for all services sectors in wholesale and retail trade (G) and in transport, storage and communication (I). For imports, this is only the case for wholesale and retail trade in all countries. 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 firms trading services in the business services, computer and R&D sector is between those for low and for high-tech manufacturing.
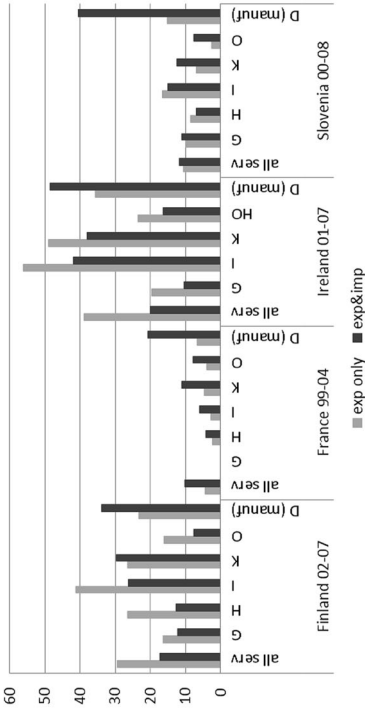
Figure 1 also shows that the share of one-way traders is proportionally higher in the services sectors than in manufacturing. This is true especially for importers as in many sectors nearly half of importers do not export. In Breinlich and Criscuolo (2011) the share of one-way traders is also proportionally 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.

Export intensities vary across sectors. 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.[8] 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 other 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.
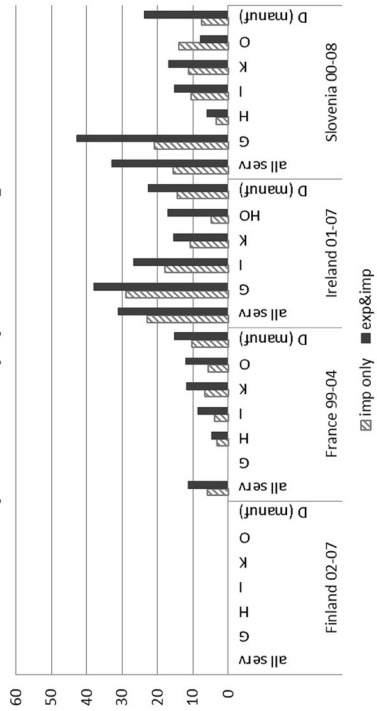
In Ireland and Slovenia where the services sector average includes information on wholesale and retail trade (G), the average share of imports in turnover is higher than in manufacturing. In France, where we do not have data for sector G the opposite is true. The share of imports in turnover is higher 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 firms' imports in turnover is highest in wholesale and retail trade (G). The shares in all other sectors are below the average across services sectors.

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[8] 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.
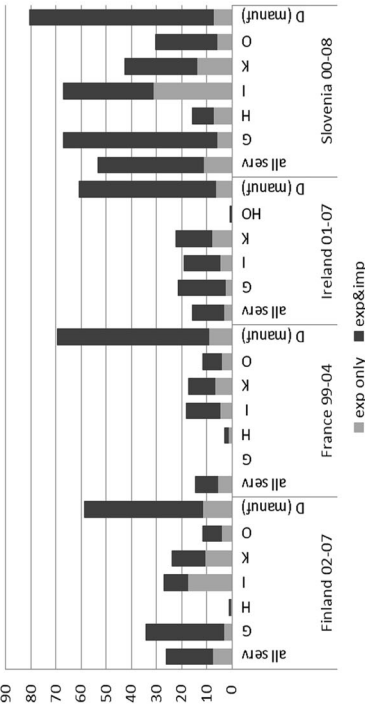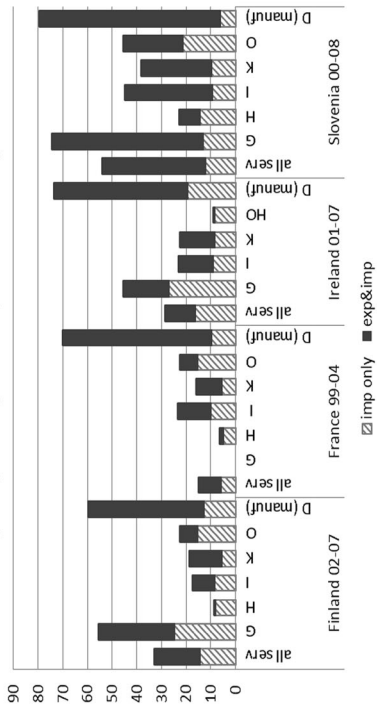
Figure 2 breaks trade participation and trade intensity down by firm size classes for the firms in the services sectors. In all four countries the shares of exporters and importers increase with firm size (panels on the left). In contrast export and import intensities decrease in firm size (panels on the right). 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.

The share of one-way traders among all exporters and all importers is proportionately much higher among smaller firms. The exception is again 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 3 shows the extensive and intensive margins of trade by ownership. Multinationals—whether domestic or foreign-owned—are more active in foreign trade than services firms with local owners and no affiliates abroad. 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 are based on evidence from only two countries. Among domestic firms, trading is much more common in Slovenia than in Finland or Ireland (we do not have access to data on ownership for France).
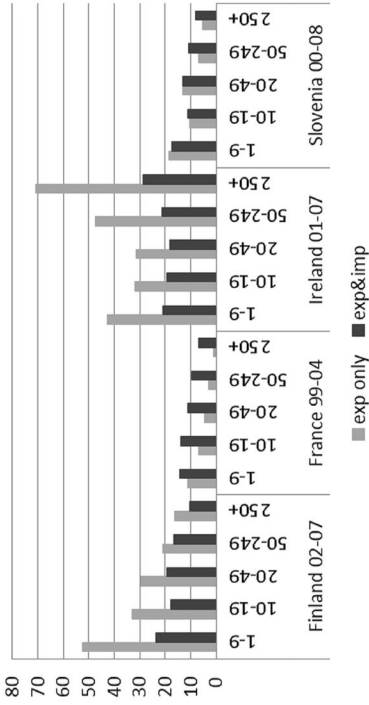
As far as ownership of firms is concerned, differences in trade intensities tend to be smaller than differences in trade participation. The main difference that emerges is that foreign-owned one-way traders have considerably higher trade intensities than purely domestic firms and to a lesser extent also than domestic multinationals.

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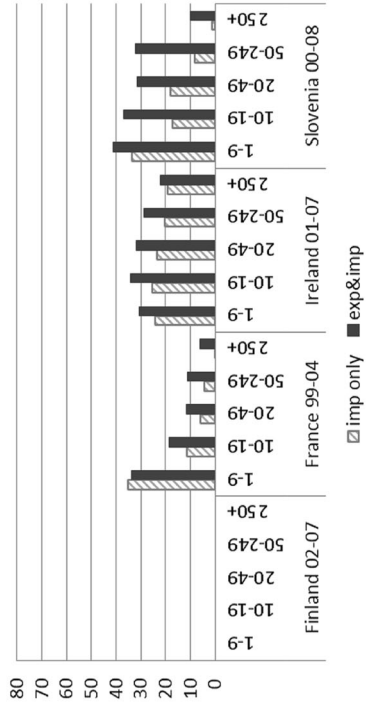
$$Y_{it} = \text{Exp only}_{it-1} + \text{Imp only}_{it-1} + \text{Exp\&Imp}_{it-1} + \text{size}_{it-1} + \text{foreign}_{it-1} + \text{LP}_{it-1} + \gamma_I + \gamma_t + \varepsilon_{it}$$

(1)

where Y_{it} represents firm i's trading status in year 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 (γ_I) and year (γ_t) dummies. To capture differences in firm size, we use four firm size classes (10–19, 20–49, 50–249 and 250+ employees); the
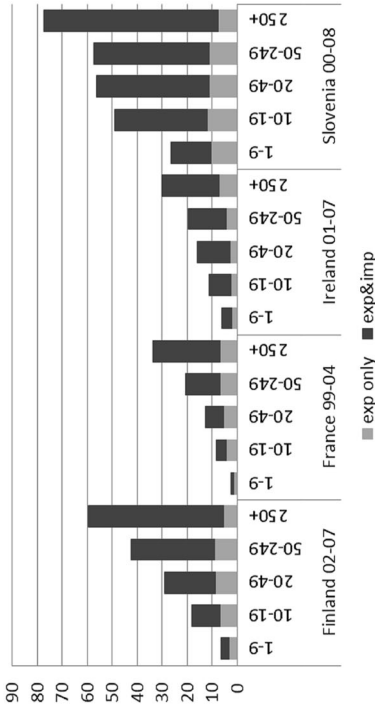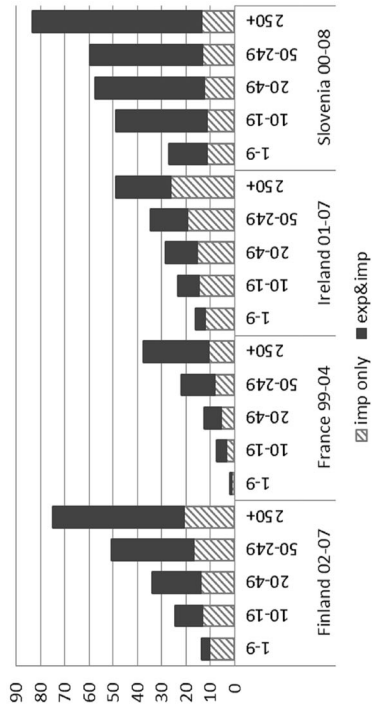
◀ **Fig. 2** Trade participation and trade intensity (export/import share in turnover) by firm size class, all sectors (%). *Note* Own calculations based on national datasets for firms with a median of 10 or more employees over the sample period. Figures for France do not contain information on sector G (wholesale and retail trade). Imports for Slovenia cover only goods but not services imports

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 that used by Bernard and Jensen (1999).

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 both 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 did estimate multinomial logit models for each country with similar results. However, when we test for the validity of the assumption of the independence of irrelevant alternatives (IIA) in the multinomial logit models 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 trading statuses 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 coefficients on importing only in the regressions with exporting only as the dependent variable and the coefficients on exporting only in the regressions with importing only as the dependent variable are negative. This suggests that there is very little 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.

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; it is positive and significant for being an exporter&importer in two out of three countries where information is available. Productivity is unambiguously positively related only to being an exporter&importer in all countries. Productivity is positively related to being an importer only in France, in the other three countries it is negative. Productivity is positively associated with being an exporter only in Finland and France, but negatively in Slovenia. Taken together, the analysis shows that the characteristics of traders in the services sectors are similar to those in the manufacturing sectors identified in earlier work. First, trading status is highly persistent. Second, larger firms are more likely to import only or to be
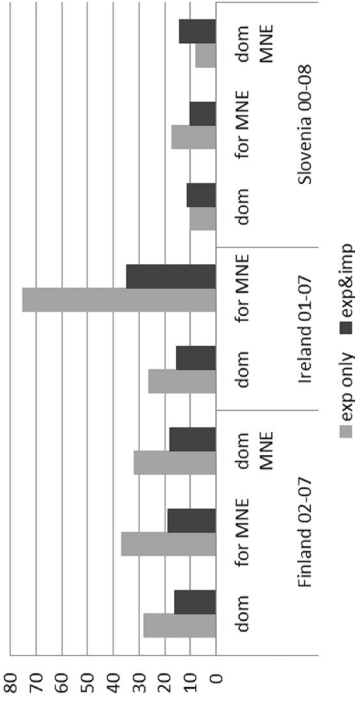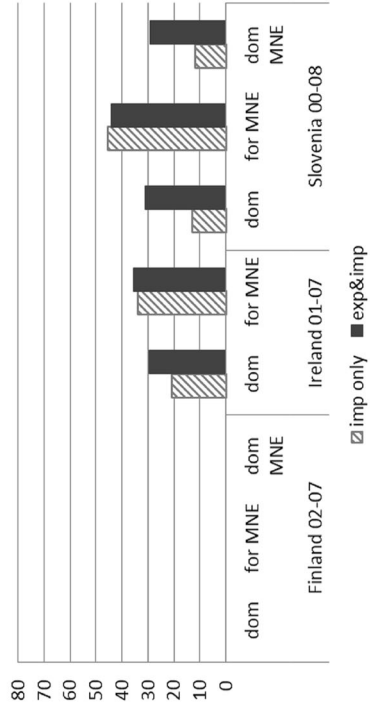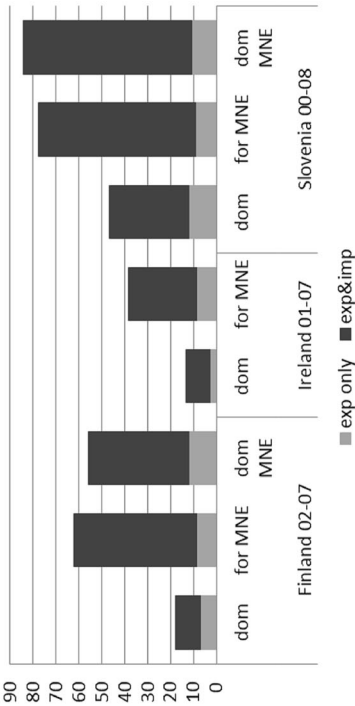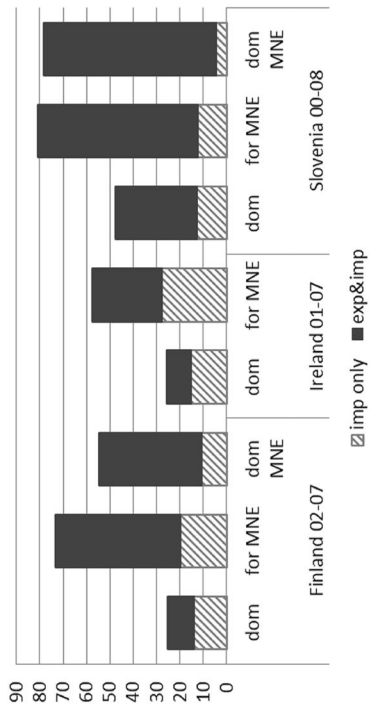
Export participation - period average

Export intensity - period average

Import participation - period average

Import intensity - period average

◀ **Fig. 3** Trade participation and trade intensity (export/import share in turnover) by owner, all sectors (%). *Note* Own calculations based on national datasets for firms with a median of 10 or more employees over the sample period. Figures for France do not contain information on sector G (wholesale and retail trade). Imports for Slovenia cover only goods but not services imports

exporters&importers. And third, more productive firms are more likely to both export and import.

3.3 What do firms trade?

In this section we investigate how important trade in services is when it emanates from firms in the services sectors. Specifically, we examine whether firms trade goods, services or both and in which proportions.

Figure 4 shows the share of services trade in total trade by sector. On average, most of the value of trade by services sector firms is actually generated by trade in 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) where only a small share of export value is due to 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 is lower than the corresponding share of services exports in overall 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 very small proportion of overall trade in the manufacturing sectors both on the export and on the import side.

When looking at participation, Table 5 shows that although exports of services 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 a substantial fraction of trade in goods among the services sectors—is not included in the services sector average. Most of the trade in goods is by firms that both export and import. Firms that export only are more or equally likely to trade services only 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. Close to half of firms that import goods only are one-way traders, in Ireland the one-way traders even outnumber the two-way traders which trade only goods. Two-way traders account

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

	Finland		France		Ireland		Slovenia	
Probability of being an exporter only								
Exp only$_{t-1}$	1.398	(0.052)***	1.292	(0.030)***	3.149	(0.078)***	1.020	(0.060)***
Imp only$_{t-1}$	−0.399	(0.064)***	0.208	(0.034)***	−0.899	(0.284)***	−0.335	(0.078)***
Exp&Imp$_{t-1}$	0.226	(0.048)***	0.342	(0.028)***	0.293	(0.086)***	0.038	(0.055)
Size$_{t-1}$ (20–49)	0.049	(0.038)	0.097	(0.023)***	−0.091	(0.085)	−0.157	(0.057)***
Size$_{t-1}$ (50–249)	−0.044	(0.051)	0.141	(0.025)***	−0.007	(0.091)	−0.191	(0.073)***
Size$_{t-1}$ (250*)	−0.387	(0.104)***	0.153	(0.037)***	−0.146	(0.142)	−0.576	(0.165)***
fo$_{t-1}$	−0.064	(0.057)			0.233	(0.083)***	−0.057	(0.085)
LP$_{t-1}$	0.147	(0.020)***	0.154	(0.010)***	0.016	(0.033)	−0.061	(0.026)**
Obs/firms	36,657	9,059	85,676	28,864	19,438	7,248	17,370	2,644
LogL	−8,873.6		−15,197.4		−952.2		−4,456.7	
Probability of being an importer only								
Exp only$_{t-1}$	−0.172	(0.057)***	0.225	(0.034)***	−0.476	(0.169)***	−0.185	(0.078)**
Imp only$_{t-1}$	2.158	(0.026)***	1.493	(0.028)***	3.120	(0.040)***	1.149	(0.059)***
Exp&Imp$_{t-1}$	0.241	(0.034)***	0.421	(0.027)***	0.061	(0.058)	0.037	(0.056)
Size$_{t-1}$ (20–49)	0.038	(0.024)	0.157	(0.023)***	0.080	(0.048)*	0.049	(0.054)
Size$_{t-1}$ (50–249)	0.150	(0.031)***	0.300	(0.025)***	0.132	(0.053)**	−0.013	(0.070)
Size$_{t-1}$ (250*)	0.110	(0.054)**	0.420	(0.034)***	0.205	(0.084)**	0.001	(0.139)
fo$_{t-1}$	0.011	(0.034)			0.096	(0.056)*	−0.183	(0.081)**
LP$_{t-1}$	−0.022	(0.013)	0.146	(0.010)***	−0.047	(0.024)**	−0.109	(0.024)***
Obs/firms	36,657	9,059	85,676	28,864	19,438	7,248	17,370	2,644
LogL	−6,812.8		−15,399.4		−3,020.5		−4,366.8	

Table 4 continued

	Finland		France		Ireland		Slovenia	
Probability of being an exporter&importer								
Exp only$_{t-1}$	1.134	(0.042)***	1.180	(0.028)***	0.991	(0.082)***	1.127	(0.061)***
Imp only$_{t-1}$	0.937	(0.038)***	1.198	(0.028)***	0.610	(0.063)***	1.139	(0.060)***
Exp&Imp$_{t-1}$	2.853	(0.036)***	2.714	(0.024)***	3.635	(0.060)***	2.583	(0.056)***
Size$_{t-1}$ (20–49)	0.224	(0.028)***	0.199	(0.028)***	0.110	(0.060)*	0.164	(0.041)***
Size$_{t-1}$ (50–249)	0.352	(0.034)***	0.459	(0.028)***	0.053	(0.066)	0.334	(0.054)***
Size$_{t-1}$ (250*)	0.744	(0.055)***	0.746	(0.035)***	0.138	(0.095)	0.835	(0.106)***
fo$_{t-1}$	0.172	(0.033)***			−0.020	(0.058)	0.247	(0.057)***
LP$_{t-1}$	0.135	(0.015)***	0.259	(0.010)***	0.078	(0.024)***	0.358	(0.023)***
Obs/firms	36,657	9,059	85,676	28,864	19,438	7,248	17,370	2,644
LogL	−6,753.0		−11,234.0		−2,004.7		−5,302.0	

Regressions for firms in all services sectors combined with a median of 10 or more employees over the sample period. The data for France do not contain information on sector G (wholesale and retail trade). Marginal effects and standard errors reported in parentheses. All regressions include 2-digit industry and year dummies. ***, ** and * represent significance at 1, 5 and 10 % respectively
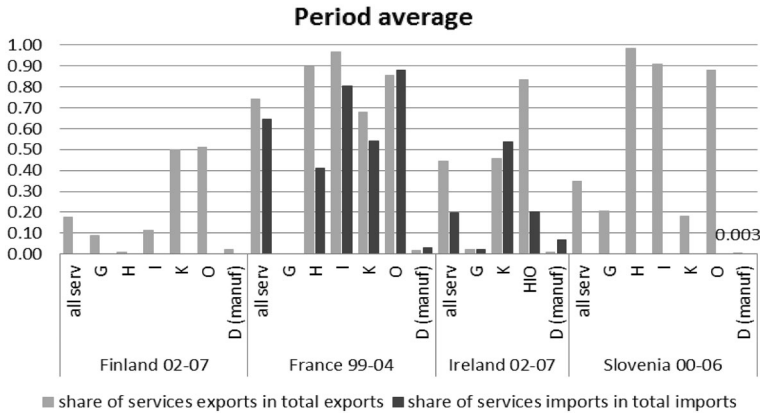
Fig. 4 Share of services trade in total trade. *Note* Own calculations based on national datasets for firms with a median of 10 or more employees over the sample period. *G* wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods, *H* hotels, bars and restaurants, *I* transport, storage and communication, *K* real estate, renting and business activities, *O* other community, social and personal service activities. Finland: There is no information on the value of goods imports for Finnish firms. Figures for manufacturing do not include NACE 32. France: Figures for all services do not include sector G (wholesale and retail trade). Ireland: For manufacturing data on exports are for 2007 and data on imports for 2006 and 2007, since information on services trade is not available for earlier years. Slovenia: Data cover 2000–2006 only because exports more than double between 2006 and 2007 after a change in the reporting requirements on the balance sheets

for higher shares of firms that import services only or goods and services than one-way traders.

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 Eq. (1) above. We run probit regressions of the following form, here for exports (the regressions for imports are analogous):

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

$$(2)$$

where Y_{it} denotes the export status of firm i at time t, namely *Exp goods only*, *Exp servs only* and *Exp goods&servs*. As in Eq. (1) we control for firm size, foreign ownership, labour productivity, industry and year dummies. A multinomial model would have been more appropriate here as well. Results from the multinomial model are similar to those presented, but the IIA assumption is violated in all cases. Again these regressions should be read as indicative 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 6 shows the results for the determinants of exporting goods/services or both and Table 7 the results for importing goods/services or both.

Table 6 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

Table 5 Share of traders by item traded—all services sectors, period average

	Finland 2003–2007	France 1999–2004[a]	Ireland 2002–2007	Slovenia 2000–2008
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

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

[a] Figures for France do not contain information on sector G (wholesale and retail trade)

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 7 is very similar to that on the export side. Firm size is positively associated 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 and for importing goods and services.

Table 6 Determinants of exporting goods, services or both—probit regressions

	Finland	France	Ireland	Slovenia
Probability of exporting goods only				
Exp goods only$_{t-1}$	2.017 (0.032)***	1.949 (0.019)***	2.939 (0.052)***	1.682 (0.048)***
Exp servs only$_{t-1}$	−0.236 (0.089)***	−0.147 (0.041)***	1.295 (0.089)***	−0.059 (0.053)
Exp goods&servs$_{t-1}$	−0.018 (0.051)	0.647 (0.034)***	1.313 (0.110)***	0.518 (0.050)***
Size$_{t-1}$ (20–49)	0.126 (0.025)***	0.135 (0.022)***	0.083 (0.069)	0.097 (0.036)***
Size$_{t-1}$ (50–249)	0.063 (0.033)	0.265 (0.022)***	0.040 (0.075)	0.123 (0.047)***
Size$_{t-1}$ (250+)	0.197 (0.057)	0.314 (0.031)***	0.064 (0.109)	0.161 (0.094)*
fo$_{t-1}$	0.051 (0.033)		0.000 (0.062)	−0.091 (0.048)*
LP$_{t-1}$	0.148 (0.014)***	0.170 (0.009)***	0.078 (0.026)***	0.166 (0.019)***
Obs/firms	36,657 9,059	85,676 28,864	15,844 6,117	17,370 2,644
LogL	−9,680.0	−14,689.0	−1,826.0	−5,745.7
Probability of exporting services only				
Exp goods only$_{t-1}$	−0.231 (0.082)***	−0.229 (0.041)***	1.425 (0.095)***	−0.069 (0.052)
Exp servs only$_{t-1}$	1.812 (0.079)***	1.681 (0.034)***	2.932 (0.074)***	1.455 (0.052)***
Exp goods&servs$_{t-1}$	0.779 (0.068)***	0.662 (0.040)***	1.317 (0.135)***	0.484 (0.055)***
Size$_{t-1}$ (20–49)	0.319 (0.060)***	0.171 (0.029)***	−0.165 (0.086)*	−0.077 (0.045)*
Size$_{t-1}$ (50–249)	0.381 (0.068)***	0.387 (0.030)***	−0.149 (0.092)	−0.105 (0.058)*
Size$_{t-1}$ (250+)	0.236 (0.109)**	0.565 (0.041)***	−0.042 (0.118)	−0.022 (0.113)
fo$_{t-1}$	0.231 (0.061)***		0.184 (0.072)**	0.240 (0.062)***
LP$_{t-1}$	0.049 (0.026)*	0.278 (0.012)***	−0.019 (0.031)	−0.026 (0.021)
Obs/firms	36,657 9,059	85,676 28,864	15,844 6,117	17,370 2,644
LogL	−2,062.6	−10,668.9	−1,103.3	−5,311.3

Table 6 continued

	Finland		France		Ireland		Slovenia	
Probability of exporting goods&services								
Exp goods only$_{t-1}$	0.919	(0.060)***	1.132	(0.038)***	0.928	(0.142)***	1.061	(0.056)***
Exp servs only$_{t-1}$	1.618	(0.073)***	1.146	(0.043)***	1.127	(0.168)***	0.968	(0.060)***
Exp goods&servs$_{t-1}$	3.042	(0.061)***	2.480	(0.042)***	3.152	(0.151)***	2.289	(0.064)***
Size$_{t-1}$ (20–49)	0.313	(0.054)***	0.180	(0.043)***	0.071	(0.152)	0.045	(0.036)
Size$_{t-1}$ (50–249)	0.614	(0.056)***	0.449	(0.043)***	0.174	(0.158)	0.212	(0.045)***
Size$_{t-1}$ (250+)	1.009	(0.077)***	0.841	(0.052)***	−0.032	(0.227)	0.482	(0.085)***
fo$_{t-1}$	0.279	(0.045)***			−0.098	(0.116)	0.105	(0.043)**
LP$_{t-1}$	0.130	(0.023)***	0.234	(0.015)***	0.086	(0.049)*	0.227	(0.020)***
Obs/firms	36,657	9,059	85,676	28,864	15,844	6,117	17,370	2,644
LogL	−2,443.4		−5,621.4		−522.4		−4,650.8	

Regressions for firms in all services sectors combined with a median of 10 or more employees over the sample period. The data for France do not contain information on sector G (wholesale and retail trade). 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 7 Determinants of imports of goods, services or both—probit regressions

	Finland		France		Ireland	
Probability of importing goods only						
Imp goods only$_{t-1}$	2.369	(0.024)***	2.005	(0.018)***	2.798	(0.039)***
Imp servs only$_{t-1}$	−0.418	(0.094)***	−0.013	(0.043)	1.235	(0.078)***
Imp goods&servs$_{t-1}$	0.149	(0.051)***	0.670	(0.033)***	1.245	(0.063)***
Size$_{t-1}$ (20–49)	0.108	(0.024)***	0.182	(0.021)***	−0.008	(0.049)
Size$_{t-1}$ (50–249)	0.147	(0.031)***	0.358	(0.022)***	−0.029	(0.054)
Size$_{t-1}$ (250+)	0.182	(0.054)***	0.444	(0.029)***	0.103	(0.080)
fo$_{t-1}$	−0.044	(0.035)			−0.107	(0.051)**
LP$_{t-1}$	0.050	(0.013)***	0.175	(0.009)***	−0.027	(0.022)
Obs/firms	36,657	9,059	85,676	28,864	15,844	6,117
LogL	−8,882.7		−16,627.2		−3,357.0	
Probability of importing services only						
Imp goods only$_{t-1}$	−0.496	(0.095)***	−0.081	(0.041)**	0.860	(0.074)***
Imp servs only$_{t-1}$	2.097	(0.064)***	1.660	(0.040)***	2.589	(0.076)***
Imp goods&servs$_{t-1}$	0.580	(0.079)***	0.752	(0.043)***	0.774	(0.097)***
Size$_{t-1}$ (20–49)	0.524	(0.061)***	0.209	(0.034)***	−0.004	(0.081)
Size$_{t-1}$ (50–249)	0.772	(0.069)***	0.394	(0.036)***	−0.053	(0.087)
Size$_{t-1}$ (250+)	0.880	(0.100)***	0.542	(0.048)***	−0.059	(0.117)
fo$_{t-1}$	0.238	(0.058)***			0.119	(0.068)*
LP$_{t-1}$	0.164	(0.024)***	0.288	(0.014)***	0.080	(0.030)***
Obs/firms	36,657	9,059	85,676	28,864	15,844	6,117
LogL	−2,359.2		−8,421.0		−1,278.9	
Probability of importing goods&services						
Imp goods only$_{t-1}$	0.791	(0.072)***	1.035	(0.037)***	1.143	(0.077)***
Imp servs only$_{t-1}$	1.011	(0.084)***	1.237	(0.044)***	1.134	(0.109)***
Imp goods&servs$_{t-1}$	2.935	(0.076)***	2.477	(0.041)***	2.896	(0.077)***
Size$_{t-1}$ (20–49)	0.288	(0.056)***	0.149	(0.047)***	0.255	(0.088)***
Size$_{t-1}$ (50–249)	0.589	(0.057)***	0.487	(0.045)***	0.356	(0.091)***
Size$_{t-1}$ (250+)	1.010	(0.075)***	0.913	(0.051)***	0.385	(0.116)***
fo$_{t-1}$	0.443	(0.043)***			0.189	(0.064)***
LP$_{t-1}$	0.160	(0.023)***	0.271	(0.014)***	−0.004	(0.029)
Obs/firms	36,657	9,059	85,676	28,864	15,844	6,117
LogL	−2,304.3		−5,245.2		−1,708.9	

Regressions for firms in all services sectors combined with a median of 10 or more employees over the sample period. The data for France do not contain information on sector G (wholesale and retail trade). Marginal effects and standard errors reported in parentheses. All regressions include 2-digit industry and year dummies. ***, ** and * represent significance at 1, 5 and 10 % respectively

3.4 Differences between trading firms

Previous research for manufacturing has shown that there are large differences between trading firms. For example ISGEP (2008) shows that among firms with 20 or more employees the top 10 % of exporters account for at least 70 % of overall export value in all of the 13 countries where data is available in their study. In Table 8 we present figures on trade concentration in the services sectors and in manufacturing for our four countries. Both in the services and in the manufacturing sectors exports are highly concentrated in the hands of the largest 1, 5 or 10 % of exporters. For Ireland and Slovenia the differences between services and manufacturing sectors are tiny at the 5 and 10 % levels. For France, exports in the services sectors are more concentrated in the hands of a few very large exporters than in manufacturing, while the opposite is true in Finland. The top 1 % of exporters in the services sectors account 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 the services sectors 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 %. For imports differences to manufacturing are not as clear-cut. 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 of trade. Figure 5 shows that two-way traders account for the bulk of total exports in the services sector. 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 %.

In terms of imports, one-way traders contribute only a small share to total imports. Firms that import only play a larger role in the services sectors than in manufacturing in all 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.

The increasing availability of customs data has allowed researchers to study the concentration also at the firm level rather than just across firms. A number of recent papers have shown 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 et al. (2008) for Sweden, Muûls and Pisu (2009) for Belgium, Castellani et al. (2010) for Italy, and Eaton

Table 8 Contribution of largest traders to overall trade

	Exports			Imports		
	1 %	5 %	10 %	1 %	5 %	10 %
All services						
Finland 2002–2007	40.3	67.1	77.9	na	na	na
France 1999–2004	59.6	82.5	90.3	52.6	80.4	89.1
Ireland 2001–2007	56.6	83.2	90.4	42.7	70.7	81.3
Slovenia 2000–2008	36.3	65.2	78.2	42.0	65.3	76.2
G						
Finland 2002–2007	47.2	73.3	83.9	na	na	na
France 1999–2004	na	na	na	na	na	na
Ireland 2001–2007	54.0	79.8	87.0	32.3	63.2	75.4
Slovenia 2000–2008	31.7	62.1	76.4	36.5	61.4	71.8
H						
Finland 2002–2007	na	na	na	na	na	na
France 1999–2004	46.8	74.7	85.2	54.3	75.9	84.7
Ireland 2001–2007 (HO)	c	64.4	71.6	c	62.0	75.1
Slovenia 2000–2008	m	42.6	65.3	20.7	47.7	64.7
I						
Finland 2002–2007	37.6	63.9	75.9	na	na	na
France 1999–2004	59.9	91.6	95.5	31.5	66.2	81.0
Ireland 2001–2007	45.0	75.3	86.5	47.4	72.9	84.0
Slovenia 2000–2008	29.4	64.5	76.5	31.0	75.3	87.5
K						
Finland 2002–2007	26.1	53.5	67.4	na	na	na
France 1999–2004	52.1	85.3	92.4	49.7	81.1	89.7
Ireland 2001–2007	45.8	74.0	83.1	60.1	81.2	88.4
Slovenia 2000–2008	52.9	74.4	84.2	39.5	61.1	75.7
O						
Finland 2002–2007	m	36.0	52.2	na	na	na
France 1999–2004	39.3	68.4	81.2	39.1	77.6	88.4
Ireland 2001–2007	See H	See H	See H	See H	See H	See H
Slovenia 2000–2008	m	69.9	83.9	31.2	54.0	67.9
D (manuf)						
Finland 2002–2007	47.2	73.3	83.9	na	na	na
France 1999–2004	48.4	75.4	85.6	55.3	76.7	85.3
Ireland 2001–2007	59.4	83.4	90.8	60.5	80.7	87.9
Slovenia 2000–2008	39.2	66.2	78.3	38.9	64.9	77.1

Own calculations based on national datasets 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

G wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods, *H* hotels, bars and restaurants, *I* transport, storage and communication, *K* real estate, renting and business activities, *O* other community, social and personal service activities
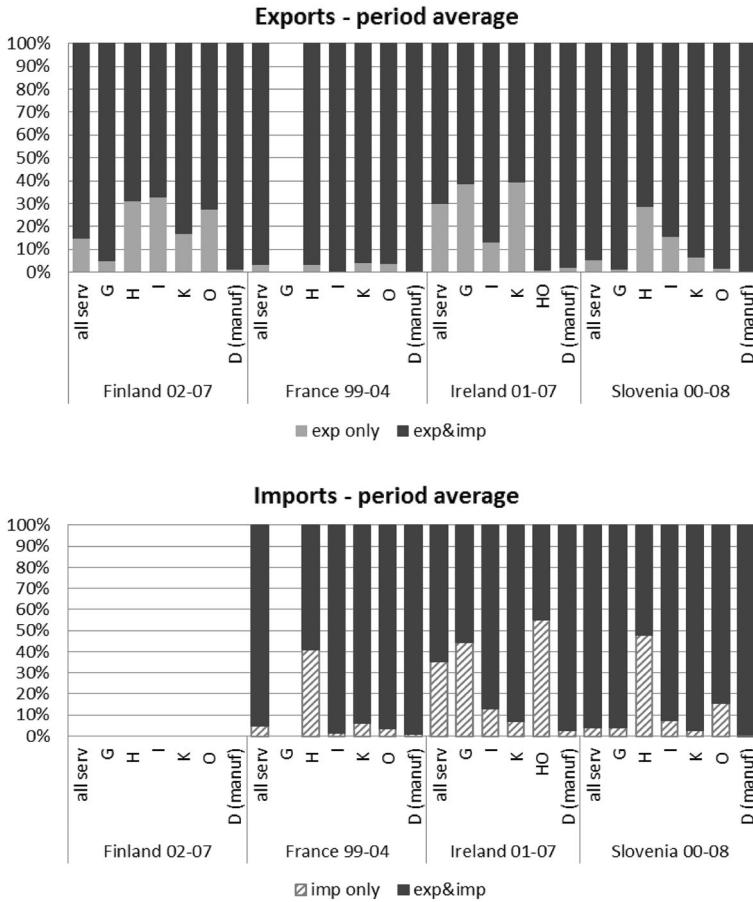
Fig. 5 Contribution of type of trader to overall trade. *Note* Own calculations based on national datasets for firms in all services sectors combined with a median of 10 or more employees over the sample period. Figures for all services for France do not contain information on sector G. Imports for Slovenia cover only goods but not services imports. *G* wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods, *H* hotels, bars and restaurants, *I* transport, storage and communication, *K* real estate, renting and business activities, *O* other community, social and personal service activities

et al. (2011) for France]. More often than not this literature also shows that those firms trading many products with many countries account for large shares of overall trade values. For trade in services Breinlich and Criscuolo (2011), Gaulier et al. (2010) and Kelle and Kleinert (2010) have shown that similar patterns emerge for the UK, France and Germany respectively. Here we show specifically what these relationships are for trade in services by firms in the services sector.

From Fig. 6 the negative relationship between the number of firms and the number of markets served described in earlier research is evident. The figure also reveals differences between the countries examined: France with an overall larger number of firms also has somewhat more weight in the centre of the distribution, i.e.
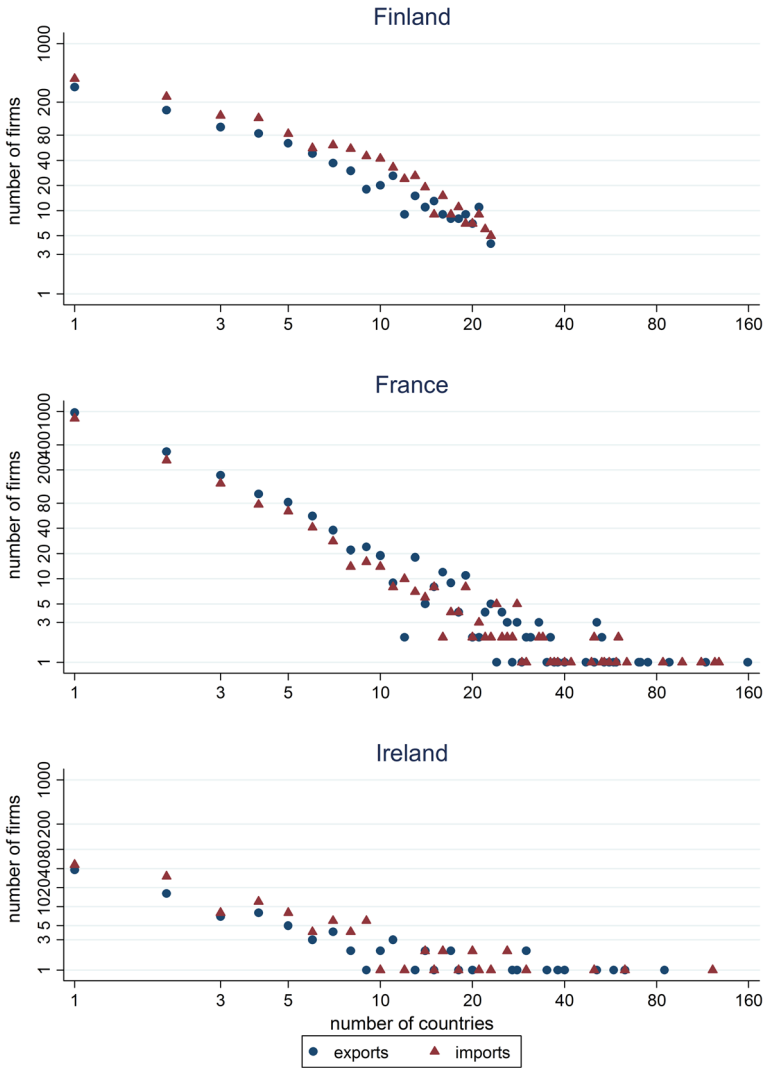
Fig. 6 Market concentration: number of firms per export/import market, services trade in the services sectors, 2004. *Note* Own calculations based on national datasets for firms in all services sectors combined with a median of 10 or more employees over the sample period (supplied by the CSO for Ireland). Figures for France do not include services trade by firms in sector G (wholesale and retail trade). For Finland markets pertaining to only 1 or 2 firms had to be blanked to preserve confidentiality

there are more firms serving a relatively large number of markets. For Finland the maximum number of markets served with services exports is less than 30 in comparison to well over 100 in both France and Ireland.[9]

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[9] 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.
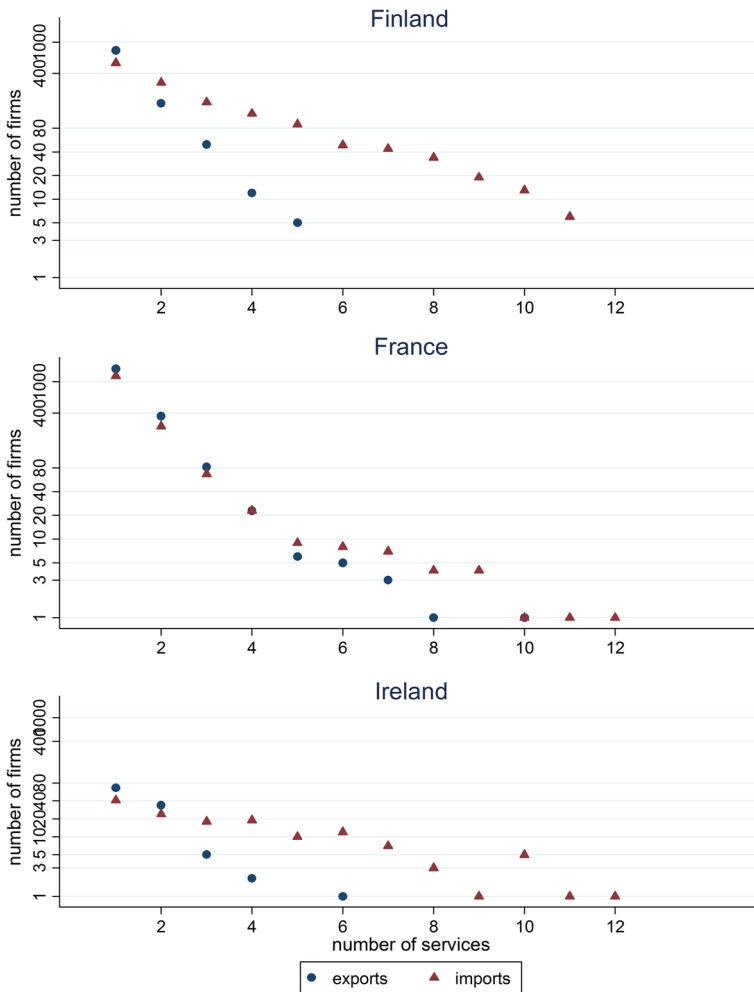
Fig. 7 Concentration of services trade across firms: number of services exported/imported by number of firms, all services sectors, 2004. *Note* Own calculations based on national datasets for firms in all services sectors combined with a median of 10 or more employees over the sample period (supplied by the CSO for Ireland). Figures for France do not include services trade by firms in sector G (wholesale and retail trade). For Finland markets pertaining to only 1 or 2 firms had to be blanked to preserve confidentiality

Figure 7 illustrates the negative relationship between the number of firms and the number of services sold. The marks for imports lie above those for exports for more than four services traded indicating that traders in the services sectors are more likely to import many 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.

Table 9 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

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

Number of services	Number of exporters				Number of services	Export value			
	Number of countries					Number of countries			
	1	2–4	5+	Total		1	2–4	5+	Total
Finland									
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									
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									
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

Own calculations based on national datasets 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). Figures for France do not include services trade by firms in sector G (wholesale and retail trade). 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

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 for 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 (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 trade in goods (e.g. Bernard et al. (2007)), the data for Ireland and Finland presented here contradict this picture. Country size may play a role in explaining these differences; however, due to a lack of further detail available to us we are unable to investigate this in more depth.

The shares of firms that export to 1, 2–4 or 5 or more countries are more evenly distributed ranging from 20 to 42 % in all three countries. In line with earlier evidence for trade in services and trade in goods, 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 is 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 for firms in five market services sectors and the manufacturing sector using firm- and activity-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 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, at the aggregate level, trends in the four countries are broadly in line with the worldwide increase in trade in services. In three out of the four countries, exports and imports of services firms grew faster than exports and imports of manufacturing firms over similar periods in the first decade of the twenty-first century. 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. Increased efforts to open up the services sectors as well as the spread of modern communication technologies have certainly also contributed to this growth. Interestingly, on the import side the differences in the share of overall imports in overall sales between services and manufacturing are not so large.

Second, exports account for a much lower share of overall sales in the services sectors than in manufacturing. This is largely because fewer firms are engaged in trade and in individual services sectors also because they trade a smaller share of their sales on average. On average across services sectors 15–25 % of firms export and 15–32 % of firms import, only in Slovenia do these figures exceed 50 %. For comparison, in manufacturing 60–80 % of firms are engaged in trade. Average trade intensities vary widely between sectors; in individual sectors they exceed the average in manufacturing. 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. Trade participation also increases with firm size, but export intensities decrease with firm size in three out of the four countries.

Third, while most firms in the services sectors trade goods, trade in services accounts for a sizeable share of the value of exports and imports in individual services sectors. 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 trade in services accounts for between 70 and nearly 100 % of total trade. Sectors where this is the case vary by country, however.

Fourth, as in manufacturing, larger and more productive services firms are more likely to engage in trade. In particular they are more likely to both export and import and to trade both goods and services. Also, trading status is highly persistent. Probit

regressions indicate that past trading status is the strongest predictor of current trading status.

Fifth, also in the services sectors trade is highly concentrated in the hands of a few large traders, but one-way traders play a bigger role. Both in services and manufacturing the largest 10 % of exporters/importers account for at least 76 % of overall exports/imports in all countries. One-way traders, i.e. 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 (compared to less than 2 % in manufacturing) as well as to their relative share in the number of traders and their trade intensities.

Sixth, few firms export many services, and few firms export to many countries. The value of services exports is increasing in the number of markets served but not necessarily in the number of services traded. Depending on the country, the 23–38 % of firms exporting services to five or more countries account for 67–90 % of the overall value from services exports. In terms of the number of services traded 61–73 % of firms export only one service, and these firms account for between 17 and 56 % of the overall value of services exports. For France we observe that a large share of export value is generated by a small number of exporters which export many services to many countries. This observation is familiar from the literature on trade in goods. However, it does not apply to the smaller countries. In Ireland and Finland the firms that export services to many countries also account for a large share of the value of services exports, but the firms which export only one or two services account for higher shares of export value than those that export many services.

5 Conclusions

In this paper we document the patterns of trade in both goods and services and the characteristics of traders in both the market services sectors and in manufacturing. We compare detailed firm- and activity-level data for four rather diverse EU countries. Despite the differences between countries, our analysis reveals a number of patterns that are similar across countries. While many of these patterns are similar in services and manufacturing, there are also some noteworthy differences.

Our research shows that trading firms in the services sectors are a product of an underlying distribution of heterogeneous firms in these sectors, at least as much as in manufacturing. Thus, the policies designed to enhance trade in manufacturing are likely to be applicable also in the services sectors. A notable difference to manufacturing where firms trade mostly goods is that services firms trade mainly services, but a significant proportion of their trade is in goods too. Hence, an increase in trade liberalisation either specific to goods (e.g. a reduction in transport costs) or services (e.g. a reduction in telecommunication costs or indeed the European Union services directive[10]) should impact the services sector in much the

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[10] The European Union Services Directive was adopted by the European Parliament and the Council on 12.12.2006. Member states were required to harmonise national legislation accordingly by 28.12.2009 (see http://ec.europa.eu/internal_market/services/services-dir/index_en.htm).

same way as suggested by the most recent models in trade theory 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.

Appendix

Types of services included in Figs. 6, 7 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.

continued

Merchanting/drop shipping

Management fees between related companies

Miscellaneous services

Royalties, licences (excluding computer), copyrights, etc.

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