

## The Performance of Trading Firms in the Services Sectors – Comparable Evidence from Four EU Countries

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### 1. INTRODUCTION

**A**LONG with the service sector accounting for an ever larger share of GDP in most developed countries, trade in services is also on the rise. We have only recently started to learn what the characteristics of firms that trade services are (Breinlich and Criscuolo, 2011). In contrast, for trading firms in the manufacturing sectors, it is well established that they are larger, more productive, more capital and skill intensive and pay higher wages than firms that do not trade. This empirical literature's focus on premia for exporting firms goes back to Bernard and Jensen (1995, 1999), and it has been surveyed by Greenaway and Kneller (2007) and Wagner (2007, 2012). More recent evidence – based again on manufacturing firms – has shown that importing firms are also more productive than non-trading firms and that firms which import and export tend to outperform firms that engage in only one dimension of trade (Andersson et al., 2008; Altomonte and Békés, 2009; Muûls and Pisu, 2009; Castellani et al., 2010; Kasahara and Lapham, 2013).

In this paper, we examine whether firms operating in the market service sectors that engage in trade also differ from their non-trading counterparts. We examine different measures of firm performance along firms' trajectories into trade, and we distinguish between trade in goods and trade in services. In particular, we analyse both established traders (firms that export and/or import) and trade starters (firms that start to export/import) in terms of size, average wages paid and productivity. In addition, we study changes in firms' trading status in terms of adding another dimension of trade (imports, exports) or another type of product (goods, services) and estimate the related switching premia. To do so, we make use of comprehensive firm-level data sets for four countries that are members of the European Union (EU), namely Finland, France, Ireland and Slovenia. A comparative study enables us to look

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for potential country-specific characteristics that might affect various dimensions of firms' trade performance.

This paper contributes to the literature in several respects. First, we re-examine some of the questions addressed in the above papers to make the case for treating common findings across papers as stylised facts more compelling. In particular, we gather data for four European countries, which differ sufficiently in terms of size, location and economic characteristics to broadly represent a cross-section of European countries. We compare the performance of non-traders, one-way traders (firms that export only or import only) and two-way traders (firms that export and import). Among exporters and importers, we establish whether there are differences in performance between firms that trade services, goods or both. Second, this is, to the best of our knowledge, the first paper to take an in-depth look at the *ex ante* premia and *ex post* gains from switching trade status of firms in the services sectors. More precisely, we explore whether *ex ante* or *ex post* productivity gains exist with respect to the time of switching from exports in services to exports in goods or exports in goods and services. We are thus able to determine whether firms are more productive before changing trading status or whether the new trading status confers specific advantages. The answer to this question has important policy implications. Third, where we observe differences in trade patterns between countries, we try to identify country characteristics which could account for this. We do this by relating our results to the study conducted by the International Study Group on Exports and Productivity (ISGEP, 2008) which compares manufacturing exporters in 14 countries. This study finds that productivity premia of manufacturing exporters are larger in countries with lower export participation rates, with more restrictive trade policies, lower *per capita* GDP, less effective government and poorer regulatory quality, and in countries exporting to relatively more distant markets.

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

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

The remainder of the paper is structured as follows: Section 2 reviews the existing theoretical and empirical literature on services trade and trade in general relevant for this paper. Section 3 introduces the data sets used. In Section 4, we present some stylised facts on

differences between trading and non-trading firms and present the estimates of trader premia for firms engaging in one-way and two-way trade in goods, services or both. Section 5 studies firms' trajectories to engaging in several dimensions of trade and presents the estimates of switching premia for firms adding a new trade dimension. The last section offers a discussion and briefly concludes.

## 2. LITERATURE REVIEW

Studying trade performance of services firms is not trivial as services frequently cannot travel unaccompanied across borders but require the producer and the consumer to be physically present at the same time in the same place. However, both manufacturing and service sector firms often trade both goods and services. The degree to which trade by services sector firms is similar to trade by manufacturing firms determines whether and to what extent recent models of firm heterogeneity based on the evidence from manufacturing firms (e.g. Bernard et al., 2003; Melitz, 2003) can also account for the sorting of firms into trading and non-trading firms in the services sector.

The discussion whether existing models of trade (in goods) are also suited to explain trade in services goes back much further to the 1970s and 1980s. Much of the early literature centres around finding an actual definition of (trade in) services with the emphasis being on the joint production and consumption requirement (Hill, 1977; Deardorff, 1985; Melvin, 1989). Since the mid-1980s, a number of contributions concluded (Bhagwati, 1984; Hindley and Smith, 1984) that many of the standard concepts such as comparative advantage and theories of the determinants of trade patterns are applicable to services (technology, endowments, the specific factors model, but not the law of one price). Markusen (1989) and van Marrewijk et al. (1997) argue that a number of characteristics that apply to manufacturing firms, such as product differentiation and scale economies, are borne also by most of the firms providing producer services. In other words, assumptions that are used in the models of goods trade can well be applied to the models explaining trade in services. Along these lines, Markusen (1989) applies the same monopolistic-competition type model to analyse trade in both producer services and manufactured intermediate goods. Furthermore, Markusen and Strand (2009) demonstrate that a theory of trade and foreign direct investment in services may require only some minor modifications to the Markusen (2002) knowledge-capital model.<sup>1</sup>

Recently, a small number of papers using firm-level data provide some evidence on similarities between firms engaged in trade of goods and firms engaged in trade of services. These papers fall into two categories. The first set examines whether exporting firms have different characteristics than non-exporters in services sectors (Kox and Rojas-Romagosa, 2010; Grublješić and Damijan, 2011; Temouri et al., 2013). The second set examines whether firms that engage in trade in services across manufacturing and services sectors – both exporters and importers – have different characteristics than firms that do not engage in trade in services (Kelle and Kleinert, 2010; Breinlich and Criscuolo, 2011; Gaulier et al., 2011). Haller et al. (2014) combine both approaches. The main message from these papers is that both trade participation and trade intensity are lower in services firms than in manufacturing firms. Trade in services is equally if not more concentrated than trade in goods among a few large firms.

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<sup>1</sup> See Hoekman (2006) for a more in-depth discussion of the theoretical models applied to trade in services.

Firms that trade services tend to be larger, more productive, more skill intensive and pay higher wages than the non-trading firms in the same industry.

There are two competing hypotheses in the literature to explain why trading firms outperform non-trading firms. The first hypothesis, the so-called self-selection hypothesis, posits that in order to enter foreign markets, firms need to first acquire knowledge about the conditions and distribution channels in that market. This is associated with extra cost compared to selling in the domestic market. As a consequence, they need to be more productive already before (*ex ante*) they start serving a foreign market. The second hypothesis argues that firms learn from foreign competitors, and thus, their productivity increases after export market entry (*ex post*).

The self-selection argument has been formalised in Melitz (2003) in the form of a sunk cost which needs to be paid to enter an export market. The empirical evidence for exporters in manufacturing and services finds support for the self-selection hypothesis. In turn, the evidence in favour of learning effects from exporting is more limited. Greenaway and Kneller (2007) and Wagner (2007) provide surveys for evidence from manufacturing. For services, Kox and Rojas-Romagosa (2010), Lööf (2010), Vogel and Wagner (2010), Breinlich and Criscuolo (2011) and Temouri et al. (2011) all find evidence of self-selection among exporters, but no evidence of learning. For importing in manufacturing, Vogel and Wagner (2010) provide evidence of self-selection of more productive German firms, but no evidence for *ex-post* learning effects. In turn, a number of papers suggest that the use of foreign intermediate goods is associated with higher plant productivity (Amiti and Konings, 2007; Halpern et al., 2009; Kasahara and Lapham, 2013).

Kasahara and Lapham (2013) extend the Melitz (2003) model to incorporate imported intermediate goods in addition to exports. In their model, they allow for both self-selection and learning-by-importing effects. As firms pay fixed costs of exporting and importing, only more productive firms will start importing and/or exporting. In addition, importers benefit from increased imports of intermediates. In line with Halpern et al. (2009) who find that approximately two-thirds of the increase in plant productivity of Hungarian firms due to importing is attributable to an increase in the variety of intermediates used in production while the remaining one-third is due to an increase in quality, Kasahara and Lapham (2013) model the productivity gains through the increased number of imported varieties of intermediates. This is confirmed empirically by Bas and Strauss-Kahn (2014), Goldberg et al. (2010) and Damijan et al. (2014) who demonstrate that obtaining access to new varieties of imported intermediate products increases introduction of new varieties for export and may raise firm productivity. The quality of the imported goods may still be important, however, as importers may improve productivity using higher quality foreign inputs or by extracting technology embodied in imported intermediates and capital goods.

While Kasahara and Lapham (2013) are agnostic about the relative size of export and import *ex ante* premia, empirical studies from manufacturing show that usually importers only are more productive than exporters only (see Vogel and Wagner 2010; Wagner 2012 for surveys). Moreover, trade premia are significantly larger for firms engaged in two trade dimensions (exports and imports) as compared to exporters only and importers only (See Bernard et al., 2007; Kasahara and Rodrigue, 2008; Muûls and Pisu, 2009; Altomonte and Békés, 2009; Halpern et al., 2009; Castellani et al., 2010; Vogel and Wagner, 2010; Haller, 2012; Kasahara and Lapham, 2013). This suggests that the *ex ante* trade premia of two-way traders should be highest, followed by importers only, exporters only and no-traders.

There are some attempts to explain the involvement of services firms in the form of wholesalers and retailers in trading manufacturing goods (see Bernard et al., 2010, 2011), but we are not aware of research studying changes in firm performance associated with services firms trading goods and/or services. Moreover, there is no evidence on the ranking of both *ex ante* and *ex post* switching premia of services firms that add a new trade dimension by switching from trading goods only or services only to trading both goods and services. Any take-up of trading activities is associated with fixed costs that are sunk costs, as both export and import agreements are preceded by a search process for potential foreign buyers or suppliers, quality inspection, negotiation, contract formulation, customs procedures, etc. This implies that switching from trading goods only (or services only) to trading both goods and services should be more costly than trading only one type of product. Thus, we may expect higher *ex ante* trade premia the larger the complexity of firms' trading activities, while *ex post* gains may be related to changes in firms' trade complexity by adding a new trade dimension or a new type of product. This paper adds to the literature by studying how and to what extent services firms gain from either adding another trade dimension (imports or exports) or adding another type of product (goods or services) to their existing trade portfolio.

### 3. DATA

#### *a. Modes of Services Trade Covered by the Data*

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

#### *b. Data Coverage*

##### *(i) 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 data set covers all firms in the Business Register using a cut-off limit of 1

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

TABLE 1  
Sectoral Coverage (NACE Rev 1.1)

	<i>Finland 2002–07</i>		<i>France 1999–2004</i>		<i>Ireland 2001–07</i>		<i>Slovenia 2000–08</i>	
	<i>Codes</i>	<i>%</i>	<i>Codes</i>	<i>%</i>	<i>Codes</i>	<i>%</i>	<i>Codes</i>	<i>%</i>
Wholesale and retail trade	G50–52	40.7	–	–	G50–52	41.8	G50–52	44.3
Hotels, bars and restaurants	H55	7.9	H55	19.7	H55	<sup>a</sup>	H55	8.6
Transport, storage and communication	I60–64	15.0	I63–64	2.9	I60–64	7.1	I60–64	10.7
Real estate, renting and business activities	K70–74	32.1	K70–72, 74	68.8	K70–74	20.1	K70–74	31.6
Other community, social and personal service activities	O90–93	4.4	O90, 92–93	8.7	O92–93	31.0 <sup>a</sup>	O92–93	4.8
Total services firms		7,842		21,436		4,906		2,599

## Notes:

(i) Number of firms and share in total number of firms are given for year 2004, includes only firms with a median of 10 or more employees over the sample period.

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

(iii) <sup>a</sup>Figure for sectors H and O combined.

Source: Indicated country sources.

employee.<sup>3</sup> It includes around 50,000 services sector firms per year over a period of six years (2002–07). The data set on International Trade in Services<sup>4</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>3</sup> The manufacture of radio, television and communication equipment and apparatus (NACE 32) was removed for confidentiality reasons.

<sup>4</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.

*(ii) France*

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

*(iii) 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>5</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 come 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.

*(iv) Slovenia*

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

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<sup>5</sup> Response rates are typically 70 per cent 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 data set 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.

collects only data for services that are related to the exports of goods (such as freight and insurance), while for the purpose of the balance of payments, Bank of Slovenia collects data on all services exports based on special surveys. The latter data at the firm level are not available to researchers.<sup>6</sup>

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

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

#### 4. STYLISED FACTS ON SERVICES TRADERS

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

##### *a. Trade Participation*

Table 2 presents figures on trade participation across services sectors. We have added the manufacturing sector as a benchmark. It reveals that trade participation is much more common across manufacturing than services firms. On average, trade participation of services firms ranges between 20 (in France though without sector G) and 64 per cent (in Slovenia) (with Ireland 33 per cent and Finland 42 per cent), while trade participation among manufacturing firms ranges between 72 and 87 per cent. There is a pattern indicating that services firms in small EU countries (Finland, Ireland, Slovenia) are more open to trade than their counterparts in a large country (France). This is in line with evidence from manufacturing (ISGEP, 2008).

Among services firms, the lowest trade participation is in the hotels and restaurants sector (H; between 7 and 30 per cent only) and the highest in the wholesale and retail sale sector (G; between 50 and 79 per cent), followed by the transport sector (I; between 29 and 77 per

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<sup>6</sup> This is potentially a problem for the interpretation of results for Slovenia as we may wrongly assume certain firms not to be services exporters and use them as controls to estimate service-exporting premia. This may lead to underestimation of the actual export premia of services firms.



TABLE 2  
Trade Participation of Manufacturing and Services Firms, by Countries  
and NACE Rev. 1.1, 2004 (in %)

	<i>No Trade</i>	<i>Export Only</i>	<i>Import Only</i>	<i>Export and Import</i>
<b>Finland</b>				
all serv.	58.4	8.2	14.7	18.8
G	41.2	3.4	24.5	30.8
H	89.9	1.3	8.5	0.3
I	62.6	18.1	9.3	10.0
K	68.7	11.8	5.7	13.8
O	69.9	4.1	18.4	7.6
D (manuf.)	28.5	11.7	12.9	47.0
<b>France</b>				
all serv.	79.5	5.5	6.0	9.0
G	–	–	–	–
H	92.7	1.6	4.4	1.3
I	71.0	4.3	10.5	14.2
K	76.9	6.7	5.8	10.5
O	73.3	4.9	8.9	12.8
D (manuf.)	20.6	9.3	9.8	60.4
<b>Ireland</b>				
all serv.	67.1	3.5	16.0	13.4
G	49.8	3.1	26.3	20.8
I	39.2	41.6	0.0	0.0
K	66.4	8.2	8.9	16.5
HO	90.5	0.3	8.2	0.9
D (manuf.)	19.9	6.5	19.7	53.9
<b>Slovenia</b>				
all serv.	35.5	11.1	11.4	42.0
G	21.3	5.3	12.5	60.9
H	69.6	8.9	14.7	6.7
I	23.4	30.2	9.0	37.4
K	48.9	14.1	7.9	29.0
O	44.0	6.4	23.2	26.4
D (manuf.)	13.0	7.5	6.3	73.2

Note:

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

Source: Indicated country sources; own calculations.

cent). Since about 40 per cent of all services firms<sup>7</sup> are in the wholesale and retail trade sector, most of the results for services firms related to trade participation are driven by firms in this particular sector. On the other hand, we have no data for sector G firms in France, and thus, the overall French results are driven by sector K (69 per cent of firms).

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

<sup>7</sup> Note that for France, there are no data available for sector G.

TABLE 3  
Type of Trade Participation of Services Firms, by Countries, Period Average (in %)

<i>Trading Status</i>	<i>Product Type</i>	<i>Finland 2003–07</i>	<i>France 1999–2004</i>	<i>Ireland 2002–07</i>	<i>Slovenia 2000–08</i>
<b>Exporters</b>					
Export only	Export only goods	25.0	21.8	9.4	4.5
	Export only services	2.1	13.9	9.6	14.5
	Export both	2.1	2.4	1.4	2.4
Export and import	Export only goods	51.5	30.8	54.9	43.0
	Export only services	4.5	15.3	18.4	14.3
	Export both	14.8	15.8	6.4	21.3
		100.0	100.0	100.0	100.0
<b>Importers</b>					
Import only	Import only goods	39.7	28.9	47.2	22.4
	Import only services	2.2	8.4	3.3	n.a.
	Import both	1.6	2.4	6.4	n.a.
Export and import	Import only goods	39.5	32.6	29.7	76.5
	Import only services	7.2	12.3	6.8	n.a.
	Import both	9.8	15.5	6.7	n.a.
		100.0	100.0	100.0	100.0

Source: Indicated country sources; own calculations.

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

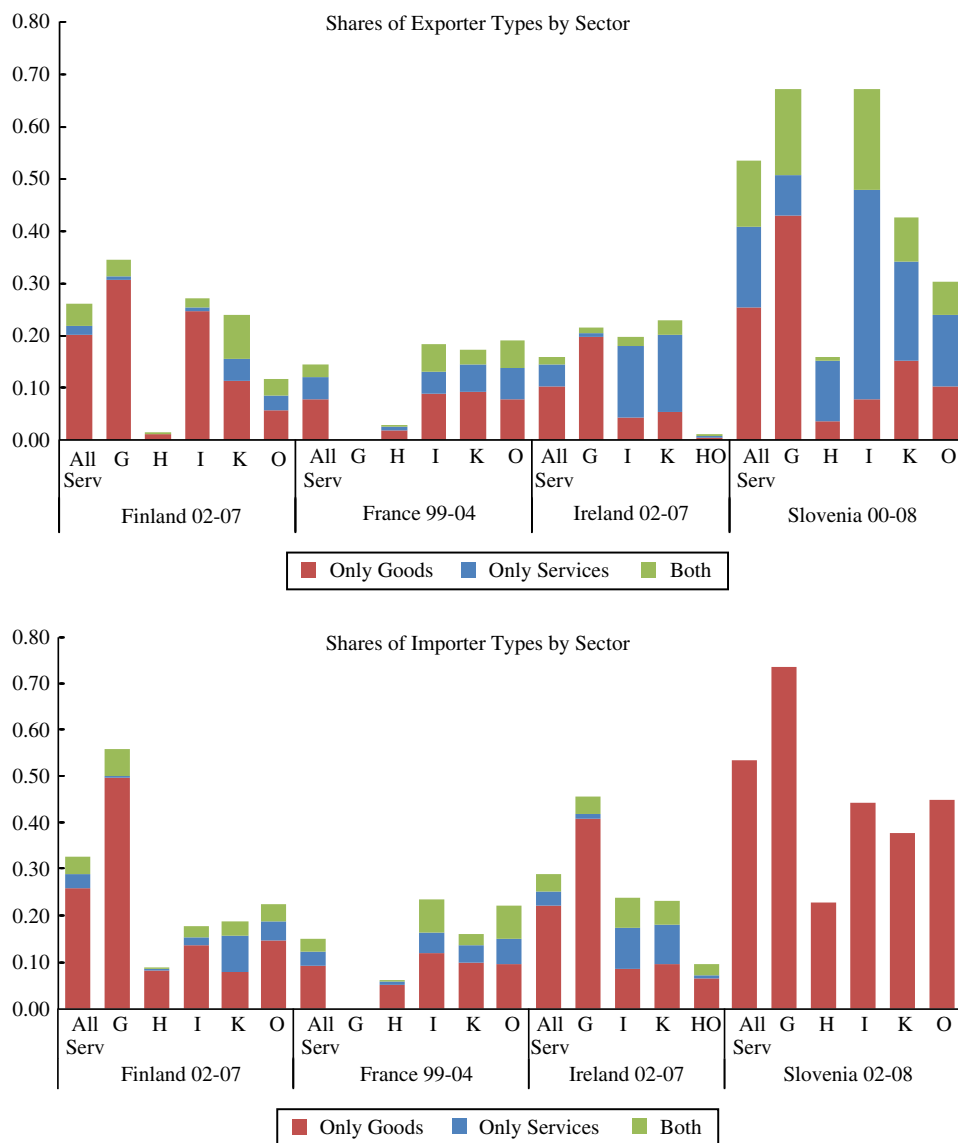
Services firms are involved in many dimensions of trade as they can serve as traders (exporters and importers) of both goods and services. Table 3 shows, however, that services firms are mainly engaged in the trade of goods, while trade in services is rather rare. Among exporters, the share of pure services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

A breakdown of services firms engaged in trade by sector (see Figure 1) reveals that among exporters, the highest reliance on exports of goods only is among the wholesale and retail firms (G). With the exception of Finland, firms in transport and communication (I) and business services (K) are proportionally more engaged in exports of services only or both goods and services. Among importers, the structure of imports by type of product is quite similar to exporters. In the wholesale and retail trade sector, imports are dominated by imports of goods only, while in transport and communication (I) and in business services (K), imports of services only are relatively more pronounced. As shown by Haller et al. (2014), the value share of services exports in total firm exports tends to be substantially higher than that of goods exports in sectors G–O for France, Slovenia and in part Ireland. Wholesale and retail trade provides the only exception in all countries considered (Figure 2).

<sup>8</sup> Note that for Slovenia, there is no information available on firm-level imports of services.

FIGURE 1

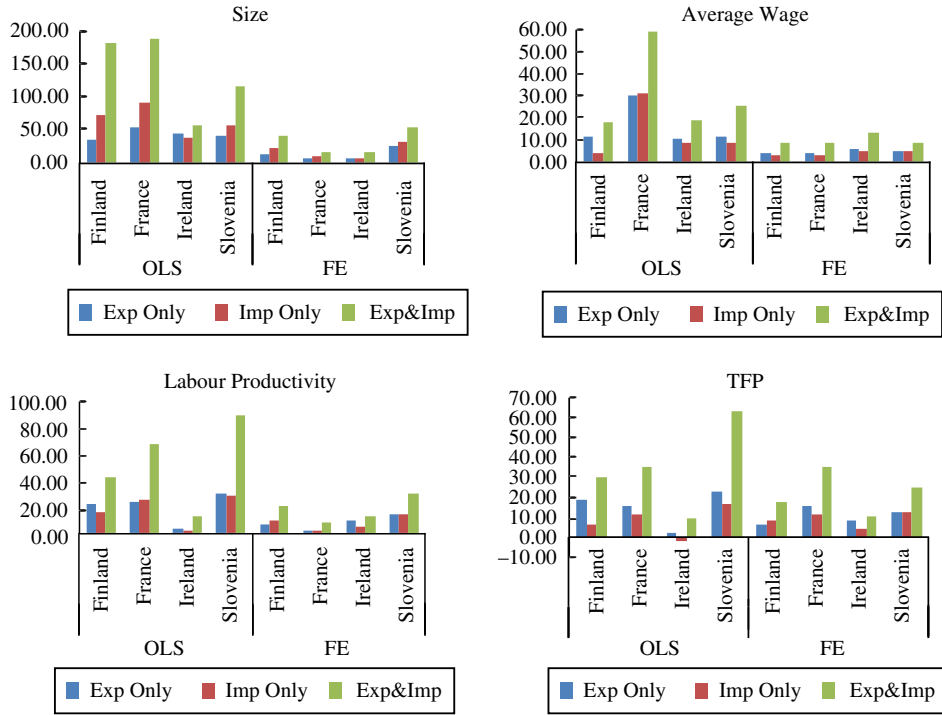
Type of Trade Participation of Services Firms, by Countries and Sectors, Period Average (in per cent)



Source: Indicated country sources; own calculations.

A companion paper to this (see Haller et al., 2014) shows that trade in different types of products is clearly increasing in firm size. Micro- and small firms are predominantly engaged in exports (or imports) of goods only. As firm size increases, firms gradually add services to their trade portfolios. For the largest size group, the share of firms trading services only or both goods and services is over 60 per cent of all firms that are engaged in trade. This

FIGURE 2  
Trading Services Firms' Size, Wage and Productivity Premia Relative to Non-traders, in per cent  
(Ordinary Least Squares (OLS) and Fixed Effects Regressions)



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

Source: Indicated country sources; own calculations.

indicates that only larger firms can afford to diversify their trade across activities, which may be related to fixed costs incurred with any of the trade dimensions.

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

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

### *b. Trade Premia*

To study the differences in performance between traders and non-traders among services firms, we compute trade premia, defined as the *ceteris paribus* percentage difference in a particular performance indicator between traders and non-traders. We compute the premia using four common performance indicators – firm size (employment), average wages, labour productivity and total factor productivity (TFP).<sup>9</sup> The trader premia are computed from a regression of log performance indicators on the contemporaneous trading status dummy (export, import, both) and a set of control variables:

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

where  $Y$  is a particular performance indicator (employment, average wages, labour productivity and TFP). *Status* is defined as a dummy variable taking value 1 if the firm exports only, imports only or both exports and imports; hence, firms that do not trade are the omitted category. *Control* variables include firm size (in terms of employment), size squared (to account for non-linearities),<sup>10</sup> log wages to proxy human capital, a dummy for foreign ownership (except for France), NACE three-digit industry and year dummies. In keeping with the literature, we estimate (1) by OLS first. We also apply fixed-effects (FE) regressions to account for unobserved firm heterogeneity, which may be correlated with the variables included in the model and may potentially lead to a biased estimate of the trader premia. This also helps to account for firm selection by capturing unobserved firm heterogeneity that may be correlated both with firm characteristics and trade premia.

The coefficients from the OLS regressions can be interpreted as conditional differences in size, wages and productivity of traders compared to the reference group, that is the industry-year averages of domestic non-traders. The fixed-effects regressions in turn estimate a correlation between a change in trading status and a change of the dependent variable as this type of regression captures firms' deviations from their own long-term averages. If time-invariant firm characteristics are correlated with trading status or the probability of switching is higher due to a contemporaneous shock, differences between the two estimation methods may emerge. It is important to note that fixed-effects regressions identify only firms that change trading statuses (however, these are few – see transition matrices in the next section).

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

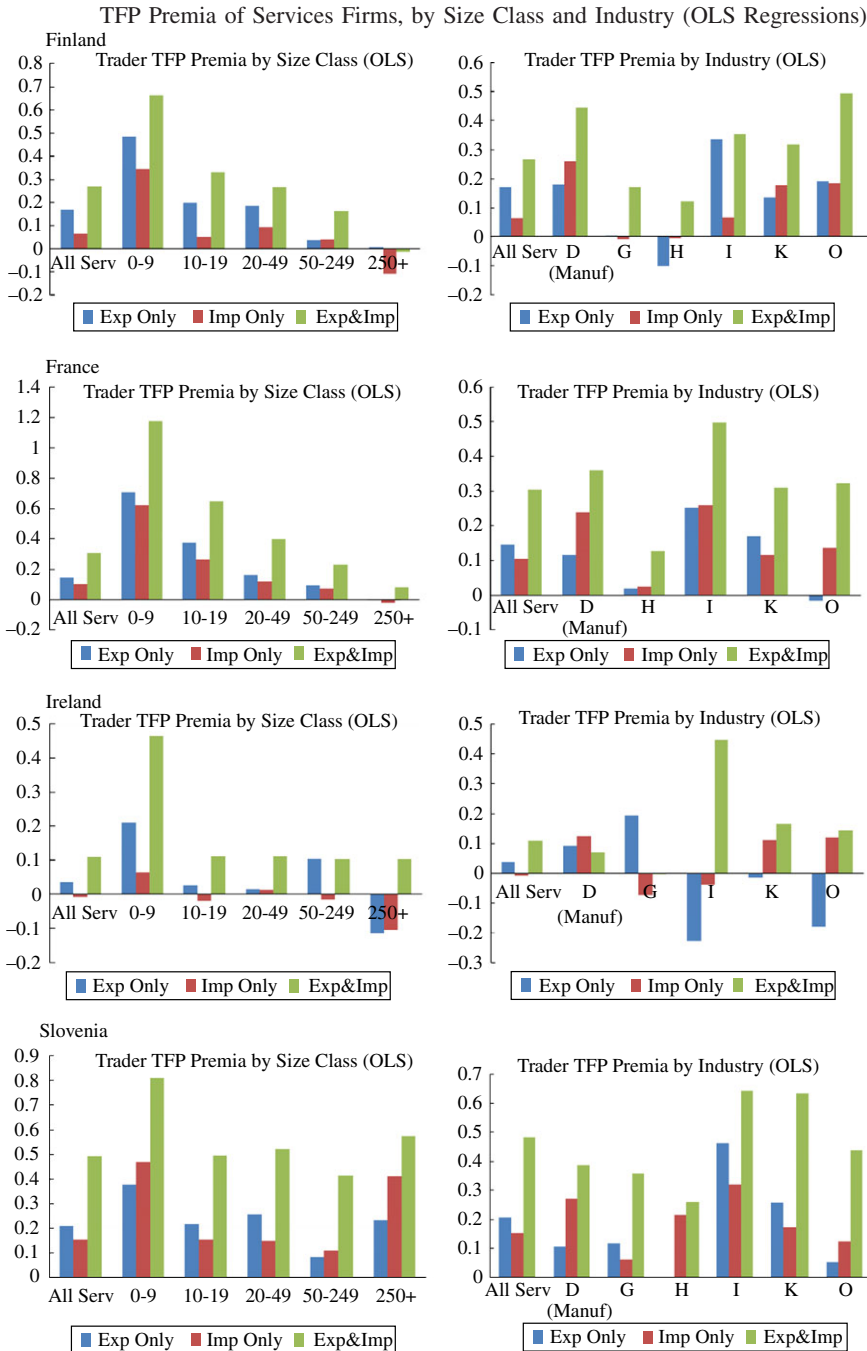
#### *(i) Results for Differences in Trading Status*

Results for trader premia for all four performance indicators are summarised in Figure 3. OLS results indicate that trading firms earn significant positive premia in all respects – they are larger, pay higher wages and have higher productivity than non-trading firms. Firms that both export and import outperform one-way traders on all accounts. Trader premia are largest

<sup>9</sup> Note that TFP for services firms is a cumbersome measure as material costs provide a less important input into services production, while on the other hand, physical productivity cannot be observed. We compute the TFP measure as a residual from a sector-specific OLS regression of log sales on log employment and log capital and a set of year and NACE three-digit industry dummy variables as well as two-digit industry-year interaction terms.

<sup>10</sup> Obviously not when size is the dependent variable.

FIGURE 3



Notes:  
 (i) Standardised beta coefficients from estimating model (1).  
 (ii) All coefficients significant at 10 per cent or better.  
 (iii) Full results can be obtained from authors upon request.  
 Source: Indicated country sources; own calculations.

for firm size, where two-way traders are shown to be up to three times bigger than non-traders. Firms that export only are 40 to 50 per cent larger than non-traders. For firms that import only the figures are 40 to 90 per cent. In terms of wages and productivity, trade premia are smaller, but still in the range 10 to 30 per cent for one-way traders and in the range 20 to 90 per cent for two-way traders. In terms of productivity, Ireland is an exception with extremely low trade premia recorded – bounded between 1 and 10 per cent only. Results also show that, with the exception of Finland, firms that export only have higher productivity (labour productivity and TFP) than firms that import only, indicating a lower fixed cost of importing than exporting.

The results from the fixed-effects estimations of trade premia are similar to the OLS results, but they tend to be lower by a factor 2–3 in Finland and Slovenia and by a factor 6–8 in France.<sup>11</sup> As mentioned above, this is to be expected as fixed-effects estimations account for the effect of changes in trading status. Nevertheless, the fixed-effects regressions show that all groups of traders benefit from changing to a new trading status and that the effect is largest for two-way traders. Again, with the exception of Finland, firms that export only have higher wage and productivity premia than firms that import only.

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

Firms in sector I (transport and communications) earn the largest TFP premia, followed by sector K (real estate, renting and business activities) and sector O (other business services). In the retail and wholesale sector (G) and in hotels and restaurants (H), the TFP premia are comparatively low – up to 20 per cent only for the group of two-way traders. Again, the aggregate ranking of traders is preserved in all sectors.

When comparing the estimated trader premia between countries, one can find very few systematic patterns. In accordance with the theoretical models of heterogeneous firms and trade (such as Melitz, 2003), one should expect an inverse relationship between trade participation and trader premia across countries as the estimated trader premia from each country can be taken as a proxy for the unobservable trade productivity cut-off driving the decision of firms to start trading. In short, this implies that in larger countries with low trade participation, the estimated trader premia should be larger. These findings are confirmed for manufacturing in the comparative ISGEP (2008) study. Our results only partially confirm the negative relationship between country size and trader premia and between trade participation and trader premia for services. While France, true to the model predictions, ranks number one or two in terms of the estimated trader premia, Slovenia and Ireland do not match these predictions. In contrast, in Slovenia, both high trade participation and the largest trader premia in terms of

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<sup>11</sup> For Ireland, the labour productivity and TFP premia obtained by fixed-effects regressions are shown to be higher than those obtained by OLS.

productivity are recorded, while Ireland systematically shows unexpectedly low trader premia given its relatively low trade participation.

When explaining the differences in the estimated exporter premia between 14 countries, the comparative ISGEP (2008) paper finds that (in addition to lower export participation rates) productivity premia are larger in countries with more restrictive trade policies, lower *per capita* GDP, less effective government and poorer regulatory quality, and in countries exporting to relatively more distant markets. With a sample of only four countries, we are unable to empirically account for the importance of these factors. However, as all four countries are members of the EU, they share much of the same regulatory framework and the same trade policies. In addition, as much as three quarters of EU countries' total trade is with other EU countries. This makes these factors unlikely drivers of the estimated trader premia. Likewise, differences in government effectiveness appear insufficient to explain the differences in the estimated trader premia.

*(ii) Results for Differences in Type of Traded Products*

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

Results for trade premia of exporters presented in Figure 4 clearly show that service sector firms that export both goods and services are the largest firms, pay the highest wages and have the highest productivity. This pattern is uniform across countries. Firms that export goods only are smaller and pay lower wages than firms that export services only, but have higher productivity (the only exception being France with the TFP measure). This indicates that exporting goods might be associated with higher fixed cost than exporting services. However, the number of observations for firms that export only services is very low, which may affect the accuracy of the estimated premia for this group of firms. Results from fixed-effects regressions suggest significant gains from switching to a new trading status (we investigate this in more detail in Section 5.1). For Finland and Ireland, they are in the range of 5 to 10 per cent, while in Slovenia and France, they are in the range of 20 to 30 per cent. The highest gains are obtained when starting to export goods only or adding services exports in firms that are already exporting goods.

We also performed estimations of export premia of services firms across size classes and industries. Results across industries show that size, wage and productivity premia relative to non-traders are largest for the group of firms with less than 10 employees in all countries. Results by industries, however, show that differences in size, wage and productivity premia across sectors are country specific. Broadly speaking, firms in sectors I (transport), K (real estate, renting and business activities) and O (other community, social and personal service activities) tend to earn the largest productivity premia, while in Finland and Slovenia also sectors G (wholesale and retail trade) and H (hotels, bars and restaurants) obtain high productivity premia. The overall ranking of premia by type of exported product is preserved both across size classes and industries.<sup>12</sup>

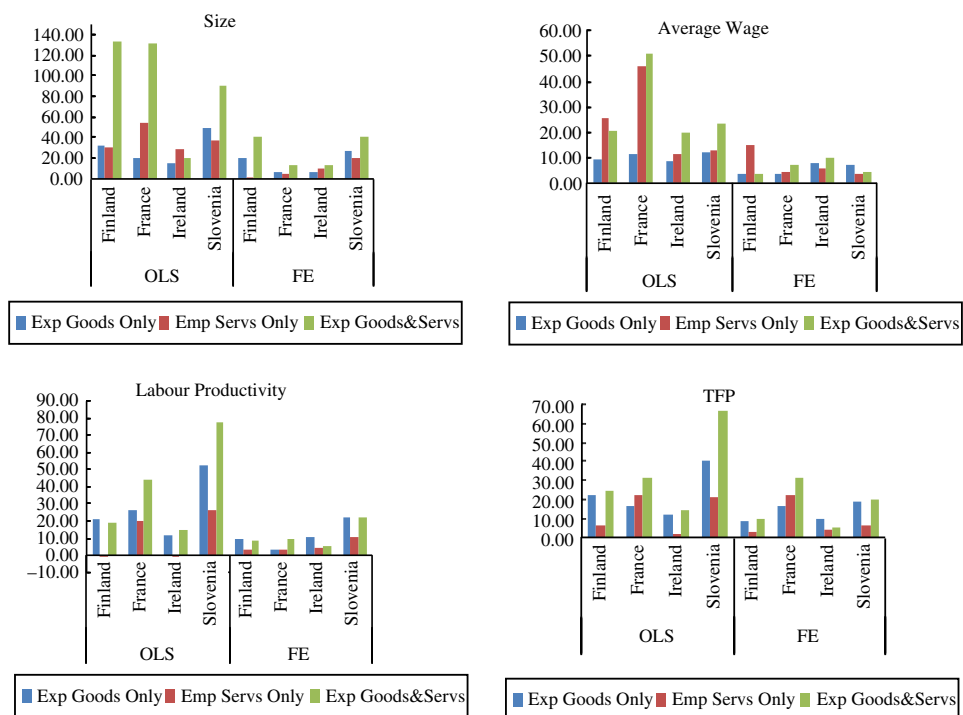
The results for trade premia of importers presented in Figure 5 in general resemble the results obtained for exporters, but with two notable departures. First, while both exporters and importers that trade both goods and services have the largest size, wage and productivity

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<sup>12</sup> Detailed results can be obtained from the authors upon request.



FIGURE 4  
Exporters' Size, Wage and Productivity Premia Relative to Non-exporters in per cent (OLS and Fixed Effects Regressions)



Notes:  
 (i) Standardised beta coefficients from estimating model (1).  
 (ii) All coefficients significant at 10 per cent or better.  
 (iii) Full results are in Table A2 in the Appendix.  
 Source: Indicated country sources; own calculations.

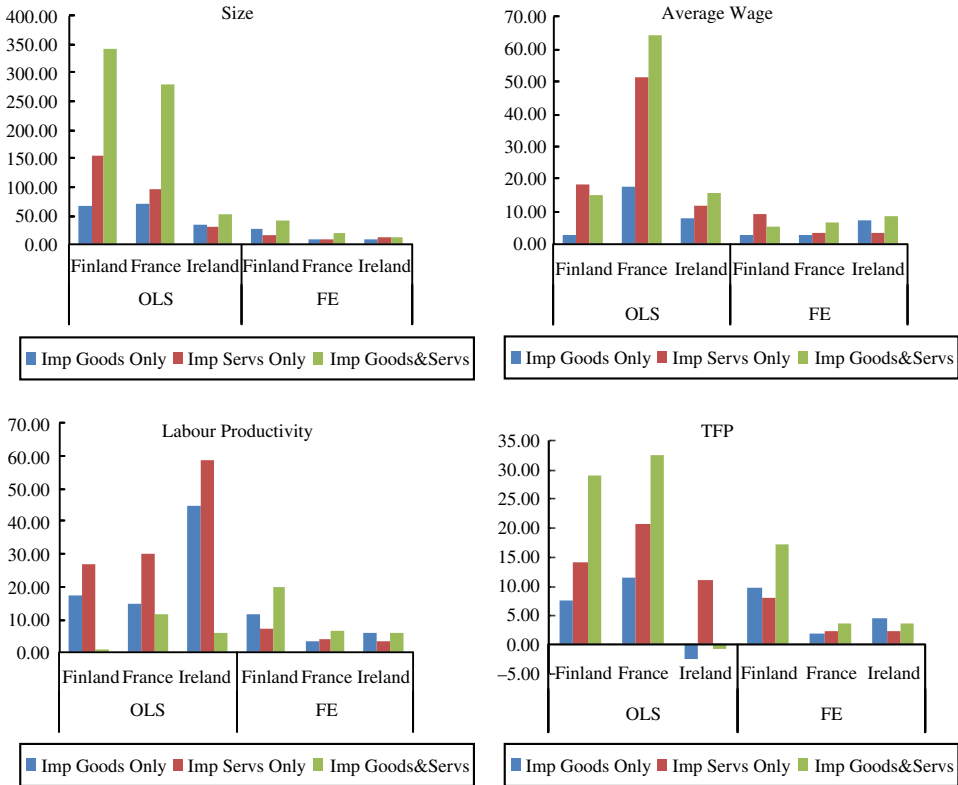
premia, firms that import services only obtain higher premia than firms that import goods only. This may indicate that importing services could be associated with higher fixed cost that importing goods. And second, the fixed-effects results suggest that for importers, switching to a new trading status brings very little gains – only between 2 and 5 per cent for France and Ireland, and up to 10 per cent for Finland. Note that gains from switching trade for exporters are considerably higher (by up to two times).

Comparing results across countries confirms the findings from the previous subsection showing the highest trade premia for Slovenia in terms of both measures of productivity and the highest size and wage premia for France, followed by Finland and Slovenia. This is to be expected as here we estimated the same trade premia but decomposed them into trade premia for trading goods, services or both.

5. TRANSITIONS AND PERFORMANCE OF FIRMS SWITCHING TRADING STATUS

The stylised facts presented in the previous section indicate several important features of services firms that engage in trade. First, similar to manufacturing firms, trade by services

FIGURE 5  
 Importers' Size, Wage and Productivity Premia Relative to Non-importers in per cent  
 (OLS and Fixed Effects Regressions)



Notes:  
 (i) Standardised beta coefficients from estimating model (1).  
 (ii) All coefficients significant at 10 per cent or better.  
 (iii) Full results are in Table A3 in the Appendix.  
 Source: Indicated country sources; own calculations.

firms is associated with a significant fixed cost of engaging in trade, where the cost of importing appears to be lower than the cost of exporting. Second, trading services is associated with a higher fixed cost than trading goods, which enables low productivity services firms to engage in the trade of goods but not of services. Third, trade diversification of services firms by type of product traded (goods or services) is increasing in firm size. This implies that only large and/or high-productivity firms trade both goods and services. And fourth, results from fixed-effects regressions suggest significant gains from switching to a new trading status. Here, the productivity premia for starting to export services and from switching from exporting goods only to also exporting services are higher than for the same transitions among importers. In this section, we take a closer look at the gains from adding additional dimensions of trade. We study both switching trading status (Section 5.1) and switching between trading goods and services (Section 5.2).

TABLE 4  
Transition Matrices for Changes between Trading Statuses, Year-on-year Average Over Period (in %)

Country (From-To)	No Trade	Export Only	Import Only	Export and Import
Finland 2002–07				
No trade	90.9	4.2	4.0	0.9
Export only	22.7	60.0	2.3	15.0
Import only	14.8	1.4	71.2	12.6
Export and import	2.3	5.0	8.4	84.2
France 1999–2004				
No trade	93.7	2.8	2.7	0.8
Export only	38.6	39.8	5.8	15.8
Import only	35.6	5.7	43.7	15.0
Export and import	5.8	8.9	9.7	75.6
Ireland 2001–07				
No trade	96.4	0.5	2.5	0.6
Export only	10.9	79.1	0.7	9.2
Import only	6.5	0.0	89.7	3.8
Export and import	3.3	1.7	3.5	91.5
Slovenia 2000–08				
No trade	83.7	6.3	7.3	2.7
Export only	17.1	59.6	3.4	20.0
Import only	20.5	3.1	55.0	21.5
Export and import	1.3	6.1	5.7	86.9

Source: Indicated country sources; own calculations.

### a. Gains from Switching Trading Status

#### (i) Transitions between Trade Statuses

We start by documenting the extent to which firms change between trading statuses. Table 4 shows that trading status of services firms is highly persistent for all four countries. Trade persistence is highest for firms that do not trade (as high as 84 to 96 per cent of all firms) and firms that both export and import (between 76 and 92 per cent). Switchers are quite rare: there are only very few trade starters (only 3.6 to 16 per cent of all firms), but more trade stoppers (up to 40 per cent). The highest tendency to stop trading is recorded for firms that export only (between 11 and 39 per cent), followed by firms that import only (between 7 and 36 per cent).<sup>13</sup> The highest transition rates from one-way to two-way trading are observed in Slovenia (up to 22 per cent) and the lowest in Ireland (less than 4 per cent among importers and 9 per cent among exporters).

#### (ii) Switching Premia

We study the gains from switching trading status by amending the now standard econometric analysis of the *ex ante* (pre-switching) premia and *ex post* (post-switching) gains. By doing this, we test the empirical validity of the two competing hypotheses in the exporter literature.

<sup>13</sup> For Irish manufacturing firms, Table 7 in Haller (2012) shows that once firms are engaged in at least one dimension of trade, they are more likely to exit the market than to reduce the number of dimensions they trade in. Since with the exception of Slovenia our data sets cover the population of firms only above a certain size threshold, we are unable to examine firm exit with the data sets at hand.

As discussed in the literature review, the self-selection hypothesis assumes that more productive firms self-select into a certain trading status (no trade, export only, import only, export and import). In this case, the differences in firm performance between trade starters (switchers) and non-traders should be significant several years before the switch. We can also check which trading status is associated with the largest pre-switching premium. A competing, learning-from-trade hypothesis assumes that trade starters or switchers gain significant *ex post* premia from switching, that is differences in firm performance between switchers and non-switchers become significant only after the former switched trading status. Again, we can investigate which trading status is associated with the largest post-switching premium. Given the complexity of potential modes of trade engagement, this approach provides an important novelty in the literature on trade in services.<sup>14</sup>

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

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

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

where  $Y$  is the performance indicator of interest (employment, average wages, labour productivity, TFP and export or import value). *Switch* is defined as a dummy variable taking value 1 if a firm changes trading status in one of the following ways: (i) from no trade to exporting only, (ii) from no trade to importing only, (iii) from no trade to exporting and importing, (iv) from exporting only to both exporting and importing, (v) from importing only to both exporting and importing, and 0 otherwise. *Control* is a vector of control variables that includes the logarithms of firm size (in terms of employment) and wages to proxy human capital, as well as a dummy for foreign ownership (except for France), year, NACE three-digit industry and two-digit industry–year interaction dummies.

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

Using this approach, we are able to get a clean comparison between switchers and non-switchers and, thus, close to estimating a causal effect of switching on firm performance. Identification in this case requires that self-selection effects are measured well

<sup>14</sup> A similar approach is used in Haller (2012) for transitions of Irish manufacturing firms between exporting, importing and intrafirm trade.

before the switch and learning effects well after the switch. Our restriction of observing firms for five consecutive years is at the lower end compared to the related literature, but it does reduce the number of switchers further. Clearly, this has implications for the efficiency of the econometric estimations and the size of the standard errors of the estimated coefficients.

Results for switching premia in terms of labour productivity are reported in Table 5.<sup>15</sup> The results show some interesting regularities. Firms in France and Slovenia that switch from no trade to exporting only benefit from the switch in terms of increased labour productivity from the year of the switch onwards, where the premium trends upwards. In Finland, the opposite effect is recorded, with a significant premium before the switch and the size of the premium decreasing afterwards. In Ireland, the coefficients are small and positive but not significant.

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

To summarise the findings, the only evidence in support of learning from switching trading status emerges in Slovenian data (in four of the five trade switching episodes), where in two episodes, the productivity gains occurred after the switch, and in two episodes, the productivity premia increased further after the switch. In France, productivity significantly improved after the switch in two of the five trade switching episodes, while in two episodes, the pre-switch premia were reduced or disappeared completely after the switch. In Finland, for four of the five transitions, the productivity premia were significantly positive already before the switch, but then decrease in three episodes after the switch. Only for one episode (from importing only to two-way trade) is there an increasing trend after the switch. In Ireland, there is only one trade switching episode (from no trade to both exporting and importing) where significant productivity premia of switchers are recorded. Based on these findings, we can conclude that similarly to the findings on manufacturing firms, there is a prevalent self-selection effect of services firms into different trading status, while learning effects are, with the exception of Slovenia, rare. No systematic patterns of differences between countries can be identified.

Another interesting feature arising from the results is the ranking order of the estimated productivity premia associated with switching. The highest productivity premia are recorded for firms switching from no trade to both exporting and importing, followed by the switch from importing only to both importing and exporting and by the switch from exporting only to both importing and exporting. This suggests that starting to trade requires higher productivity and that adding more dimensions of trade requires correspondingly higher productivity. In addition, for an average firm, it is relatively easier to become a two-way trader if it was engaged in importing rather than in exporting.

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<sup>15</sup> The results for other firm performance measures are in Table A5 in the Appendix.

TABLE 5  
Productivity Premia from Switching Trading Status

	<i>Finland</i>	<i>France</i>	<i>Ireland</i>	<i>Slovenia</i>
No trade to exporting only				
$t - 2$	0.203*	0.064	0.037	0.047
$t - 1$	0.236**	0.132	0.088	0.126
$t$	0.189*	0.232*	0.002	0.251***
$t + 1$	0.179*	0.272*	0.054	0.318*
$t + 2$	0.135	0.294*	0.051	0.375**
Adj. $R^2$	0.68	0.73	0.83	0.45
Obs.	18,273	39,442	6,344	3,965
Firms	3,137	6,852	1,043	553
Switchers	52	41	6	43
No trade to importing only				
$t - 2$	0.144	0.072	0.015	0.136
$t - 1$	0.189*	0.140***	0.014	0.069
$t$	0.205*	0.146*	-0.028	0.142
$t + 1$	0.216**	0.214*	-0.038	0.070
$t + 2$	0.229**	0.194*	-0.032	0.126
Adj. $R^2$	0.68	0.73	0.83	0.43
Obs.	18,348	39,372	6,599	3,849
Firms	3,152	6,838	1,094	534
Switchers	67	29	57	22
No trade to exporting and importing				
$t - 2$	0.203	0.382***	0.470**	0.49*9
$t - 1$	0.430**	0.045	0.487**	0.635**
$t$	0.294*	0.274*	0.467**	1.049**
$t + 1$	0.283**	0.313**	0.5145**	1.090**
$t + 2$	0.198*	0.173	0.530**	1.226**
Adj. $R^2$	0.68	0.73	0.83	0.45
Obs.	18,073	39,282	6,374	3,807
Firms	3,097	6,820	1,049	525
Switchers	12	10	12	13
Exporting only to exporting and importing				
$t - 2$	0.381***	0.356***	-0.018	0.182
$t - 1$	0.407*	0.364***	-0.055	0.209
$t$	0.386***	0.314***	-0.093	0.264***
$t + 1$	0.392***	0.217	-0.122	0.310***
$t + 2$	0.339***	0.309	-0.083	0.329*
Adj. $R^2$	0.53	0.65	0.79	0.45
Obs.	761	455	321	796
Firms	144	85	58	133
Switchers	24	19	17	20
Importing only to exporting and importing				
$t - 2$	0.079	0.385*	-0.061	0.631**
$t - 1$	0.069	0.359*	-0.082	0.666**
$t$	0.117	0.333*	-0.006	0.667**
$t + 1$	0.201*	0.354*	-0.057	0.712**
$t + 2$	0.211*	0.248	-0.079	0.730**
Adj. $R^2$	0.50	0.61	0.78	0.47

TABLE 5 *Continued*

	<i>Finland</i>	<i>France</i>	<i>Ireland</i>	<i>Slovenia</i>
Obs.	2,801	798	2,045	762
Firms	498	145	338	133
Switchers	56	38	26	60

Notes:

(i) Coefficients from OLS regression with labour productivity as a dependent variable according to model (2).

(ii) Switch in period  $t$ .

(iii) Regressions control for firm size, foreign ownership (except for France), average wages, three-digit industry, year and two-digit industry-year interaction dummies.

(iv) Full results are in Table A5 in Appendix.

(v) \*\*, \* and \*\*\* denote significance at 1, 5 and 10%.

### *b. Gains from Switching between Trading Goods and Services*

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

#### *(i) Transitions between Trading Goods and Services*

Table 6 shows the transition matrices for switching between trading goods and services for exporters. Export status of services firms is highly persistent in all four countries. Persistence

TABLE 6  
Transition Matrices for Changes between Types of Exporting – Year-on-year Average Over Period

<i>Country (From–To)</i>	<i>No Export</i>	<i>Export Goods</i>	<i>Export Services</i>	<i>Export Goods and Services</i>
Finland 2002–07				
No export	93.1	6.0	0.7	0.2
Export goods	16.3	79.9	0.5	3.3
Export services	25.1	5.4	45.5	24.1
Export goods and services	3.7	10.1	9.5	76.7
France 1999–2004				
No export	95.2	2.7	1.9	0.3
Export goods	29.8	60.2	2.2	7.9
Export services	32.9	3.6	53.1	10.4
Export goods and services	7.0	18.4	16.4	58.3
Ireland 2002–07				
No export	98.3	1.1	0.5	0.1
Export goods	9.4	83.9	4.7	2.1
Export services	9.2	9.2	78.5	3.1
Export goods and services	6.5	18.4	13.1	62.0

Source: Indicated country sources; own calculations.

is highest for firms that never export (between 87 and 98 per cent of all non-exporters never decide to start exporting) and for firms that export goods only (between 60 and 84 per cent). There are high dropout rates for firms that export services only and firms that export goods only, with the former are higher than the latter. This indicates higher uncertainty in exporting services than goods. There is also a significant share of firms that switch from exporting goods only or services only to exporting both. The frequencies seem to be higher for firms switching from exporting services only than from exporting goods only. This again is indicative of a higher fixed cost of exporting services than exporting goods.

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

*(ii) Switching Premia*

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

TABLE 7  
Transition Matrices for Changes between Types of Importing – Year-on-year Average Over Period

Country (From–To)	No Import	Import Goods	Import Services	Import Goods and Services
Finland 2002–07				
No import	93.8	4.9	1.1	0.1
Import goods	11.3	85.7	0.2	2.7
Import services	21.3	1.8	68.7	8.3
Import goods and services	2.0	15.1	8.6	74.2
France 1999–2004				
No import	95.3	3.17	1.33	0.22
Import goods	28.7	63.35	2.00	5.95
Import services	32.2	5.86	49.35	12.57
Import goods and services	6.2	19.89	15.00	58.93
Ireland 2002–07				
No import	96.22	2.67	0.68	0.44
Import goods	6.18	86.01	2.61	5.20
Import services	10.60	15.81	65.42	8.18
Import goods and services	7.27	24.09	5.79	62.84

Source: Indicated country sources; own calculations.



TABLE 8  
Productivity Premia from Switching between Exporting Goods and Services

	<i>Finland</i>	<i>France</i>	<i>Ireland</i>
No exports to exporting goods only			
$t - 2$	0.118*	0.163*	-0.014
$t - 1$	0.132*	0.138	-0.034
$t$	0.116*	0.132*	0.006
$t + 1$	0.113*	0.127***	-0.039
$t + 2$	0.132**	0.177**	0.008
Adj. $R^2$	0.66	0.71	0.82
Obs.	24,459	45,404	7,658
Firms	4,187	7,869	1,354
Switchers	114	63	20
No exports to exporting services only			
$t - 2$	0.029	0.409**	0.185
$t - 1$	-0.001	0.476**	0.026
$t$	0.023	0.434**	0.030
$t + 1$	0.004	0.398**	0.148
$t + 2$	-0.318	0.381*	0.042
Adj. $R^2$	0.66	0.71	0.82
Obs.	23,939	45,329	7,588
Firms	4,083	7,854	1,340
Switchers	10	48	6
Exporting goods only to exporting goods and services			
$t - 2$	-0.117	0.106	
$t - 1$	-0.054	0.109	
$t$	-0.080	0.186	
$t + 1$	-0.154	0.103	
$t + 2$	-0.190	-0.055	
Adj. $R^2$	0.44	0.36	
Obs.	4,534	1,878	
Firms	801	338	
Switchers	26	25	
Exporting services only to exporting goods and services			
$t - 2$		-0.170	
$t - 1$		0.089	
$t$		0.166	
$t + 1$		0.135	
$t + 2$		0.394	
Adj. $R^2$		0.38	
Obs.		739	
Firms		136	
Switchers		11	

## Notes:

(i) Coefficients from OLS regression with labour productivity as a dependent variable according to equation (2).

(ii) Switch in period  $t$ .

(iii) Regressions also control also for firm size, foreign ownership (except in France), average wages and importer dummy, three-digit industry, year and two-digit industry-year interaction terms.

(iv) Where cells for individual countries are left blank, we have fewer than five switchers in the respective category.

(v) This is the case for all countries for a potential transition from not exporting to exporting goods and services.

(vi) \*\*, \* and \*\*\* denote significance at 1, 5 and 10%.

TABLE 9  
Productivity Premia from Switching between Importing Goods and Services

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

## Notes:

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

We account for switching premia in terms of (labour) productivity by estimating a version of model (2). Due to a lack of data for trade in services, Slovenia is not included in this part of the analysis. Another problem is a relatively small number of events for some of the

switching episodes. Due to an insufficient number of observations, there are no results for Ireland for some estimations. As discussed earlier, the small numbers involved in switching combined with the requirements to observe firms for five consecutive years results in somewhat imprecisely estimated coefficients.

Results for switching to and between trade in goods and trade in services (see Tables 8 and 9) give very similar results for exporting and for importing. We find significant productivity premia of switching only for the episodes of switching from no trade to either trade in goods or trade in services. The ranking of the estimated productivity premia is in line with the previous analysis: the highest premia are recorded for firms that switch from no trade to trade in services.<sup>16</sup> In all of the episodes, the switching premia in terms of productivity existed already two years before the switch and remained rather constant over the whole five-year period of analysis. In other words, firms deciding to start either importing or exporting were more productive than their peers already two years before the switch and remained so also after they started trading. The only difference among the trade starters is in the size of the required pre-entry premia – trading services is more costly than trading goods.

The above implies no learning effects in terms of productivity gains from switching between trading goods and services. This fact is corroborated with the results for the episodes where a firm that already traded goods (or services) later added also trade in services (goods). The coefficients for productivity premia before or after these switches are significantly different from zero only for adding services imports to already importing goods in France after the switch. While the small number of observations may play a role in the lack of significant results, the estimated premia for adding an additional product are consistently lower than those for firms starting to trade goods or services.

## 6. DISCUSSION AND CONCLUSIONS

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

Comparing the patterns in trade behaviour across the four EU countries, we find that services firms in the smaller countries (Finland, Ireland, Slovenia) are more open to trade than their counterparts in a large country (France). This is in line with evidence for manufacturing

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<sup>16</sup> There are insufficient numbers of firms that start to trade both goods and services in all countries to obtain reliable estimates.

provided by ISGEP (2008) for 14 countries. Unlike the ISGEP study, we do not observe a similar pattern for trader premia, however. The ISGEP (2008) study also finds that productivity premia are larger in countries with lower export participation rates, with more restrictive trade policies, lower *per capita* GDP, less effective government and poorer regulatory quality, and in countries exporting to relatively more distant markets. In our sample of four EU member states which differ in terms of size, historical background and geographic location, but are more or less comparable in terms of GDP *per capita* levels and share a similar regulatory framework, performance of trading firms seems to follow a rather similar pattern. The observed differences in trade performance across countries seem to be rather random and may to a certain extent be difficult to discern due to a limited number of observations given country size. A larger time series dimension or the addition of further countries should make it easier to identify country characteristics associated with differences in trading patterns and premia. We leave this to future research.

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

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

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APPENDIX

FIGURE A1  
Type of Trade Participation of Services Firms, by Countries and Size Classes, Period Average (in per cent)

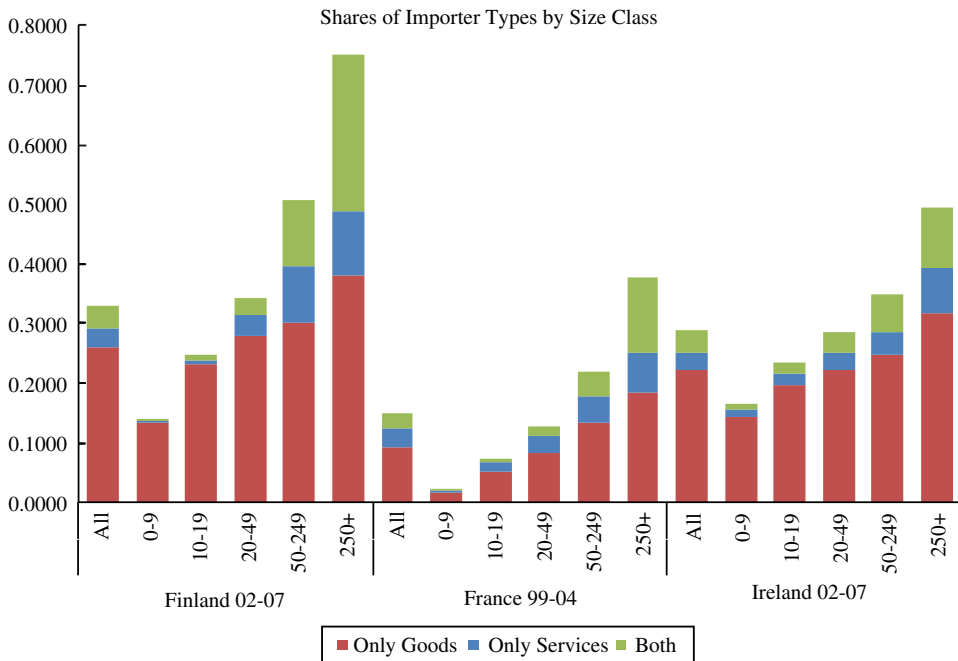
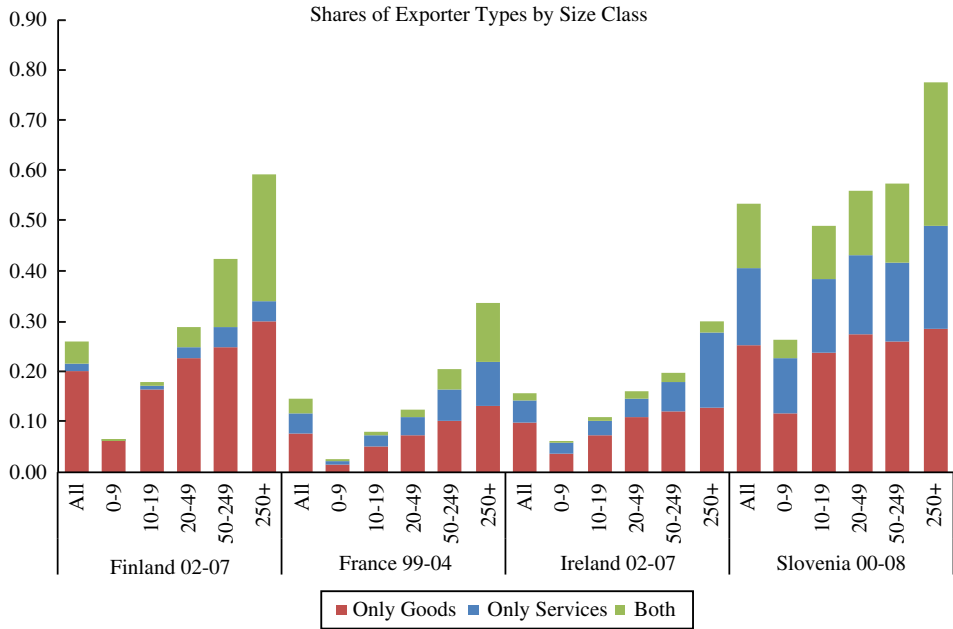


TABLE A1  
Size, Wage and Productivity Premia of Trading Firms (OLS and Fixed Effects Regressions)

	Country	Finland		France		Ireland		Slovenia	
		2001–07	1999–2004	2001–07	2000–08				
Size									
OLS	Export only	35.86 (0.000)	55.44 (0.000)	44.02 (0.000)	43.46 (0.000)				
	Import only	72.01 (0.000)	92.20 (0.000)	39.33 (0.000)	59.09 (0.000)				
	Export and import	181.44 (0.000)	189.34 (0.000)	58.58 (0.000)	117.46 (0.000)				
FE	Export only	15.46 (0.000)	8.40 (0.000)	8.50 (0.005)	27.10 (0.000)				
	Import only	23.50 (0.000)	10.63 (0.000)	8.87 (0.000)	31.85 (0.000)				
	Export and import	43.03 (0.000)	17.67 (0.000)	16.27 (0.000)	52.88 (0.000)				
	N	47,075	12,2083	38,310	23,228				
	Firms	10,095	35,336	13,736	3,561				
Average wages									
OLS	Export only	12.11 (0.000)	30.51 (0.000)	10.28 (0.000)	11.86 (0.000)				
	Import only	3.74 (0.000)	31.43 (0.000)	9.04 (0.000)	8.43 (0.000)				
	Export and import	18.15 (0.000)	59.67 (0.000)	19.28 (0.000)	25.54 (0.000)				
FE	Export only	4.11 (0.000)	4.45 (0.000)	6.36 (0.000)	5.58 (0.000)				
	Import only	3.34 (0.000)	2.84 (0.000)	5.41 (0.000)	5.59 (0.000)				
	Export and import	8.64 (0.000)	8.41 (0.000)	13.22 (0.000)	9.28 (0.000)				
	N	47,074	122,083	38,310	20,213				
	Firms	10,095	35,336	13,736	2,785				
Labour productivity									
OLS	Export only	22.03 (0.000)	24.51 (0.000)	4.35 (0.000)	31.02 (0.000)				
	Import only	15.63 (0.000)	26.11 (0.000)	1.23 (0.000)	28.95 (0.000)				
	Export and import	43.30 (0.000)	66.88 (0.000)	12.76 (0.000)	89.06 (0.000)				
FE	Export only	7.42 (0.000)	2.96 (0.000)	9.65 (0.002)	14.07 (0.000)				
	Import only	10.02 (0.000)	2.78 (0.000)	5.08 (0.000)	14.27 (0.000)				
	Export and import	20.55 (0.000)	8.75 (0.000)	12.86 (0.000)	30.24 (0.000)				



TABLE A1 Continued

Country	Finland	France	Ireland	Slovenia
Period	2001–07	1999–2004	2001–07	2000–08
N	47,074	12,2083	38,310	20,213
Firms	10,095	35,336	13,736	2,785
Total factor productivity				
OLS				
Export only	18.44	15.68	3.73	23.01
Import only	6.60	11.11	-0.83	16.25
Export and import	30.65	35.82	11.58	63.72
FE				
Export only	6.44	15.68	8.78	12.57
Import only	8.39	11.11	5.08	12.03
Export and import	17.93	35.82	11.87	25.00
N	45,291	71,483	38,025	20,085
Firms	9,758	20,564	13,613	2,777

Notes:

(i) Standardised coefficients (% interpretation) and *p*-values in parentheses.

(ii) Controls: size, size squared, foreign dummy (except for France), importer dummy, industry and year dummies.

TABLE A2  
 Exporters' Size, Wage and Productivity Premia Relative to Non-Exporters in % (OLS and Fixed Effects Regressions)

	Finland		France		Ireland		Slovenia	
	Country	Period	Country	Period	Country	Period	Country	Period
Size	OLS	Goods only	39.55	30.55	23.59	47.59	(0.000)	(0.000)
		Services only	73.23	75.09	34.85	34.79	(0.000)	(0.000)
	FE	Goods and services	242.61	176.52	40.02	82.22	(0.000)	(0.000)
		Goods only	17.00	7.83	6.88	24.72	(0.000)	(0.000)
		Services only	2.49	6.40	9.31	17.34	(0.001)	(0.000)
		Goods and services	34.43	15.45	12.13	34.16	(0.004)	(0.000)
N		47,075	12,2083	32,949	23,228			
	Firms	10,095	35,336	12,947	3,561			
Wage	OLS	Goods only	10.95	12.98	10.22	11.896	(0.000)	(0.000)
		Services only	26.73	48.84	10.84	15.525	(0.000)	(0.000)
	FE	Goods and services	23.06	53.07	22.20	23.468	(0.000)	(0.000)
		Goods only	3.87	4.59	9.535	5.657	(0.000)	(0.000)
		Services only	12.66	4.73	7.20	3.698	(0.000)	(0.000)
		Goods and services	4.69	8.17	13.25	5.463	(0.000)	(0.000)
N		47,074	122,083	32,949	20,213			
	Firms	10,095	35,336	12,947	2,785			
Labour productivity	OLS	Goods only	26.59	28.91	13.33	53.839	(0.000)	(0.000)
		Services only	6.64	22.78	1.60	24.54	(0.651)	(0.000)
	FE	Goods and services	26.96	50.04	16.09	79.96	(0.043)	(0.000)
		Goods only	9.71	4.11	12.46	21.077	(0.000)	(0.000)
		Services only	4.26	3.06	5.18	8.574	(0.013)	(0.000)
		Goods and services	7.72	9.72	8.17	21.815	(0.019)	(0.000)

TABLE A2 *Continued*

Country	Finland		France		Ireland		Slovenia	
	Period	2001–07	1999–2004	2001–07	2000–08			
N		47,074	123,883	32,949	20,213			
Firms		10,095	35,827	12,947	2,785			
Total factor productivity								
OLS								
Goods only		22.58	17.16	12.67	40.238			
Services only		5.93	21.80	3.92	21.296			
Goods and services		24.65	31.64	15.04	66.442			
FE								
Goods only		8.53	17.16	11.43	18.457			
Services only		3.29	21.80	3.16	6.771			
Goods and services		9.48	31.64	6.58	20.096			
N		45,291	71,483	32,711	20,085			
Firms		9,758	20,564	12,835	2,777			

## Notes:

(i) Standardised coefficients (% interpretation) and *p*-values in parenthesis.

(ii) Controls: size, size squared, foreign dummy (except for France), importer dummy, industry and year dummies.

TABLE A3  
 Importers' Size, Wage and Productivity Premia Relative to Non-exporters  
 in % (OLS and Fixed-Effects Regressions)

<i>Country</i>		<i>Finland</i>		<i>France</i>		<i>Ireland</i>	
<i>Period</i>		<i>2001–07</i>		<i>1999–2004</i>		<i>2001–07</i>	
<b>Size</b>							
OLS	Goods only	70.68	(0.000)	71.32	(0.000)	35.02	(0.000)
	Services only	169.90	(0.000)	94.78	(0.000)	29.97	(0.000)
	Goods and services	371.24	(0.000)	280.30	(0.000)	52.26	(0.000)
FE	Goods only	25.36	(0.000)	9.83	(0.000)	8.62	(0.000)
	Services only	16.49	(0.000)	8.09	(0.000)	12.92	(0.374)
	Goods and services	42.29	(0.000)	20.09	(0.000)	12.50	(0.000)
	<i>N</i>	46,402		123,883		32,949	
	Firms	9,950		35,827		12,947	
<b>Wage</b>							
OLS	Goods only	3.37	(0.000)	17.84	(0.000)	7.76	(0.000)
	Services only	20.77	(0.000)	51.37	(0.000)	11.54	(0.000)
	Goods and services	17.07	(0.000)	64.58	(0.000)	15.75	(0.000)
FE	Goods only	2.72	(0.000)	2.93	(0.000)	7.28	(0.000)
	Services only	8.91	(0.000)	3.40	(0.000)	3.49	(0.037)
	Goods and services	5.18	(0.001)	6.70	(0.000)	8.49	(0.000)
	<i>N</i>	46,401		123,883		32,949	
	Firms	9,950		35,827		12,947	
<b>Labour productivity</b>							
OLS	Goods only	18.28	(0.000)	27.12	(0.000)	0.07	(0.972)
	Services only	17.70	(0.000)	29.94	(0.000)	11.74	(0.006)
	Goods and services	47.92	(0.000)	58.60	(0.000)	5.80	(0.101)
FE	Goods only	11.47	(0.000)	3.55	(0.000)	5.65	(0.000)
	Services only	7.88	(0.000)	3.98	(0.000)	3.13	(0.112)
	Goods and services	20.10	(0.000)	6.53	(0.000)	6.13	(0.000)
	<i>N</i>	46,401		123,883		32,949	
	Firms	9,950		35,827		12,947	
<b>Total factor productivity</b>							
OLS	Goods only	8.85	(0.000)	11.49	(0.000)	-1.94	(0.271)
	Services only	17.63	(0.000)	20.66	(0.000)	14.21	(0.001)
	Goods and services	33.24	(0.000)	32.37	(0.000)	1.51	(0.655)
FE	Goods only	9.32	(0.000)	1.82	(0.006)	.74	(0.000)
	Services only	8.26	(0.000)	2.30	(0.060)	3.27	(0.112)
	Goods and services	17.62	(0.000)	3.61	(0.019)	5.43	(0.002)
	<i>N</i>	44,710		71,483		32,711	
	Firms	9,642		20,564		12,835	

Notes:

(i) Standardised coefficients (% interpretation) and *p*-values in parenthesis.

(ii) Controls: size, size squared, foreign dummy (except for France), importer dummy, industry and year dummies.

TABLE A4  
Numbers of Firms Switching Trading Status

	<i>Finland</i> 2004–05	<i>France</i> 2001–02	<i>Ireland</i> 2003–05	<i>Slovenia</i> 2002–06
No trade to export only	52	41	6	43
No trade to import only	67	27	57	22
No trade to export and import	12	9	12	13
Export only to export and import	24	19	17	20
Import only to export and import	56	38	26	60
Total switchers	211	134	118	158

Source: Indicated sources; own calculations.

TABLE A5  
Switching Premia from Switching Trading Status (Full Results)

	<i>Finland</i>	<i>France</i>	<i>Ireland</i>	<i>Slovenia</i>
(a) No trade to exporting only				
Size				
$t - 2$	0.119	0.247	0.201	0.104
$t - 1$	0.089	0.393*	0.230	0.191
$t$	0.060	0.459**	0.301	0.187
$t + 1$	0.091	0.386*	0.262	0.248
$t + 2$	0.044	0.452**	0.226	0.283***
Adj. $R^2$	0.10	0.24	0.23	0.13
$N$	18,273	39,442	6,344	4,704
Firms	3,137	6,852	1,043	679
Wage				
$t - 2$	0.071***	0.155*	-0.053	0.081
$t - 1$	0.236**	0.191**	-0.145	-0.012
$t$	0.189*	0.192**	-0.092	0.159**
$t + 1$	0.179*	0.215**	-0.070	0.143*
$t + 2$	0.135	0.165**	-0.102	0.148**
Adj. $R^2$	0.68	0.35	0.49	0.33
$N$	18,273	39,442	6,344	3,965
Firms	3,137	6,852	1,043	553
Labour productivity				
$t - 2$	0.203*	0.064	0.037	0.047
$t - 1$	0.236**	0.132	0.088	0.126
$t$	0.189*	0.232*	0.002	0.251***
$t + 1$	0.179*	0.272*	0.054	0.318*
$t + 2$	0.135	0.294*	0.051	0.375**
Adj. $R^2$	0.68	0.73	0.83	0.45
$N$	18,273	39,442	6,344	3,965
Firms	3,137	6,852	1,043	553
Total factor productivity				
$t - 2$	0.205*	0.209***	0.029	0.016
$t - 1$	0.254**	0.193	0.064	0.092

TABLE A5 *Continued*

	<i>Finland</i>	<i>France</i>	<i>Ireland</i>	<i>Slovenia</i>
<i>t</i>	0.205**	0.188	-0.013	0.213
<i>t</i> + 1	0.174*	0.205	0.013	0.343*
<i>t</i> + 2	0.120	0.139	0.007	0.383**
Adj. <i>R</i> <sup>2</sup>	0.79	0.57	0.83	0.28
<i>N</i>	17,570	27,668	6,304	3,904
Firms	3,066	5,618	1,037	552
(b) No trade to importing only				
Size				
<i>t</i> - 2	0.056	0.754**	0.348**	-0.274
<i>t</i> - 1	0.041	0.793**	0.403**	0.141
<i>t</i>	0.166	0.789**	0.424**	0.269
<i>t</i> + 1	0.234*	0.709**	0.449**	0.398*
<i>t</i> + 2	0.303**	0.729**	0.446**	0.353***
Adj. <i>R</i> <sup>2</sup>	0.10	0.24	0.23	0.12
<i>N</i>	18,348	39,372	6,599	4,613
Firms	3,152	6,838	1,094	665
Wage				
<i>t</i> - 2	0.003	0.136***	0.102***	-0.115
<i>t</i> - 1	0.034	0.111	0.116*	0.020
<i>t</i>	0.021	0.206**	0.128*	-0.027
<i>t</i> + 1	0.017	0.230**	0.088	-0.070
<i>t</i> + 2	-0.025	0.237**	0.057	-0.076
Adj. <i>R</i> <sup>2</sup>	0.31	0.35	0.49	0.32
<i>N</i>	18,348	39,372	6,599	3,849
Firms	3,152	6,838	1,094	534
Labour productivity				
<i>t</i> - 2	0.144	0.072	0.015	0.136
<i>t</i> - 1	0.189*	0.140***	0.014	0.069
<i>t</i>	0.205*	0.146*	-0.028	0.142
<i>t</i> + 1	0.216**	0.214*	-0.038	0.070
<i>t</i> + 2	0.229**	0.194*	-0.032	0.126
Adj. <i>R</i> <sup>2</sup>	0.68	0.73	0.83	0.43
<i>N</i>	18,348	39,372	6,599	3,849
Firms	3,152	6,838	1,094	534
Total factor productivity				
<i>t</i> - 2	0.028	-0.021	-0.037	0.095
<i>t</i> - 1	0.076	0.042	-0.028	0.128
<i>t</i>	0.080	0.101	-0.077	0.197
<i>t</i> + 1	0.098	0.122	-0.097***	0.175
<i>t</i> + 2	0.107	0.169***	-0.079	0.278***
Adj. <i>R</i> <sup>2</sup>	0.79	0.57	0.83	0.28
<i>N</i>	17,645	27,605	6,557	3,788
Firms	3,081	5,606	1,088	533
(c) No trade to exporting and importing				
Size				
<i>t</i> - 2	0.420*	0.346	0.132	-0.754**
<i>t</i> - 1	0.510*	0.739**	0.315	-0.489**
<i>t</i>	0.986**	0.940**	0.308	-0.257***

TABLE A5 *Continued*

	<i>Finland</i>	<i>France</i>	<i>Ireland</i>	<i>Slovenia</i>
$t + 1$	1.156**	0.971**	0.443	-0.153
$t + 2$	1.246**	0.974**	0.469	-0.034
Adj. $R^2$	0.11	0.24	0.21	0.12
$N$	18,073	39,282	6,374	4,566
Firms	3,097	6,820	1,049	655
Wage				
$t - 2$	0.151***	0.482**	0.229**	0.204
$t - 1$	0.469*	0.222	0.191***	0.157
$t$	0.404*	0.612**	0.214***	0.284***
$t + 1$	0.210**	0.540**	0.262*	0.254***
$t + 2$	0.242**	0.483**	0.185***	0.249
Adj. $R^2$	0.31	0.35	0.50	0.32
$N$	18,073	39,282	6,374	3,807
Firms	3,097	6,820	1,049	525
Labour productivity				
$t - 2$	0.203	0.382***	0.470**	0.499*
$t - 1$	0.430**	0.045	0.487**	0.635**
$t$	0.294*	0.274*	0.467**	1.049**
$t + 1$	0.283**	0.313**	0.514**	1.090**
$t + 2$	0.198*	0.173	0.530**	1.226**
Adj. $R^2$	0.68	0.73	0.83	0.45
$N$	18,073	39,282	6,374	3,807
Firms	3,097	6,820	1,049	525
Total factor productivity				
$t - 2$	0.114	0.304	0.517**	0.511
$t - 1$	0.376***	-0.083	0.497**	0.535**
$t$	0.193***	0.106	0.461*	0.949**
$t + 1$	0.116	0.121	0.461*	0.878*
$t + 2$	0.043	-0.030	0.479*	1.073**
Adj. $R^2$	0.79	0.57	0.83	0.28
$N$	17,370	27,547	6,334	3,747
Firms	3,026	5,591	1,043	524
(d) Exporting only to exporting and importing				
Size				
$t - 2$	-0.020	0.752*	-0.057	0.574***
$t - 1$	0.267	0.676***	-0.085	0.506
$t$	0.345***	0.753*	-0.092	0.573*
$t + 1$	0.421*	0.752*	-0.119	0.726**
$t + 2$	0.447*	0.642***	-0.109	0.732**
Adj. $R^2$	0.07	0.19	0.16	0.19
$N$	761	455	321	808
Firms	144	85	58	135
Wage				
$t - 2$	0.019	0.231	0.128	-0.115
$t - 1$	0.007	0.410**	0.159	-0.056
$t$	-0.039	0.432**	0.147	-0.032
$t + 1$	-0.020	0.486**	0.100	-0.063
$t + 2$	0.048	0.461*	0.085	-0.041

TABLE A5 *Continued*

	<i>Finland</i>	<i>France</i>	<i>Ireland</i>	<i>Slovenia</i>
Adj. $R^2$	0.33	0.43	0.51	0.59
$N$	761	455	321	796
Firms	144	85	58	133
Labour productivity				
$t - 2$	0.381***	0.356***	-0.018	0.182
$t - 1$	0.407*	0.364***	-0.055	0.209
$t$	0.386***	0.314***	-0.093	0.264***
$t + 1$	0.392***	0.217	-0.122	0.310***
$t + 2$	0.339***	0.309	-0.083	0.329*
Adj. $R^2$	0.53	0.65	0.79	0.45
$N$	761	455	321	796
Firms	144	85	58	133
Total factor productivity				
$t - 2$	0.380***	0.297	-0.024	0.184
$t - 1$	0.413***	0.291	-0.036	0.211
$t$	0.416***	0.259	-0.025	0.269***
$t + 1$	0.414***	0.159	-0.064	0.302***
$t + 2$	0.296	0.272	-0.019	0.361*
Adj. $R^2$	0.58	0.53	0.80	0.36
$N$	746	379	321	795
Firms	143	78	58	133
Export value				
$t - 2$	0.777*	1.200*	-0.164	-0.191
$t - 1$	0.753*	0.826	-0.358	-0.130
$t$	0.667***	1.098***	-0.382	0.324
$t + 1$	0.538	0.631	-0.046	0.384
$t + 2$	0.528	0.353	-0.233	0.289
Adj. $R^2$	0.41	0.13	0.70	0.35
$N$	715	455	321	808
Firms	142	85	58	135
(e) Importing only to exporting and importing				
Size				
$t - 2$	0.333*	1.133**	-0.318*	-0.150
$t - 1$	0.313*	1.180**	-0.300*	-0.092
$t$	0.346*	1.133**	-0.290***	-0.049
$t + 1$	0.370*	1.195**	-0.262	-0.049
$t + 2$	0.313*	0.933**	-0.342***	-0.134
Adj. $R^2$	0.30	0.26	0.35	0.31
$N$	2,801	798	2,045	820
Firms	498	145	338	144
Wage				
$t - 2$	0.049	0.263**	0.111	0.025
$t - 1$	0.076*	0.277**	0.097	0.030
$t$	0.077*	0.380**	0.105	0.065
$t + 1$	0.061	0.343**	0.122***	0.089
$t + 2$	0.125*	0.454**	0.048	0.134*
Adj. $R^2$	0.49	0.64	0.55	0.60
$N$	2,801	798	2,045	762



TABLE A5 *Continued*

	<i>Finland</i>	<i>France</i>	<i>Ireland</i>	<i>Slovenia</i>
Firms	498	145	338	133
Labour productivity				
$t - 2$	0.079	0.385*	-0.061	0.631**
$t - 1$	0.069	0.359*	-0.082	0.666**
$t$	0.117	0.333*	-0.006	0.667**
$t + 1$	0.201*	0.354*	-0.057	0.712**
$t + 2$	0.211*	0.248	-0.079	0.730**
Adj. $R^2$	0.50	0.61	0.78	0.47
$N$	2,801	798	2,045	762
Firms	498	145	338	133
Total factor productivity				
$t - 2$	0.091	0.257	-0.061	0.469**
$t - 1$	0.088	0.225	-0.087	0.523**
$t$	0.118	0.237	0.012	0.529**
$t + 1$	0.212*	0.225	-0.068	0.608*
$t + 2$	0.213*	0.125	-0.106	0.629**
Adj. $R^2$	0.54	0.60	0.80	0.41
$N$	2,783	732	2,029	762
Firms	498	139	337	133
Import value				
$t - 2$	na	-0.014	0.648***	0.741***
$t - 1$		0.125	0.706*	1.231**
$t$		0.490	0.866**	1.347**
$t + 1$		0.837	0.736**	1.585**
$t + 2$		0.630	0.739*	1.456**
Adj. $R^2$		0.09	0.65	0.42
$N$		798	2,045	820
Firms		145	338	144

## Notes:

(i) Coefficients from OLS regression.

(ii) Switch in period  $t$ .

(iii) Regressions control also for size (except where size is the dependent variable).

(iv) \*\*, \* and \*\*\* denote significance at 1, 5 and 10%.