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Abstract

The paper investigates the relationship between services trade performance and employment characteristics in Italian firms. Our analysis is at the micro level and descriptive in nature. We merge micro data on services trade transactions with employment and wage variables at the level of the firm. We find that firms engaged in services trade tend to employ a larger share of managers and white collars and to pay higher average wages. They also exhibit systematically smaller shares of blue collars in their employment structure. These patterns hold qualitatively across all main sectors of firms' affiliation and across sectors of traded services. We find a strong and positive association between services exports and/or imports and total employment. Regression analysis confirms this last finding and shows it is robust to controlling for various confounding heterogeneity.

Keywords

A. Introduction[*]

It is becoming more and more evident that services play a key role in international trade. The total value of cross-border services transactions amounted to 3.7 trillion US Dollars in 2017 (WTO, 2019). Counting other modes of services trade provision, including through a commercial presence in the importing country, the figure raises to 13.3 trillion US Dollars. In general, world trade in services has been growing faster than trade in goods (WTO, 2019). Internationally traded services are also increasingly used in production processes and embedded in production outputs, responding to technological progress and to firms' strategies to compete in modern economies (see for instance Francois & Reinert, 1996; Francois & Woerz, 2008; Berlingieri, 2015; Ariu *et al.*, 2019c; Hoekman & Shepherd, 2017).

These trends have fostered an expanding literature which centers on the patters and effects of services development, especially in the trade and trade policy domains (see for instance Arnold *et al.*, 2016; Beverelli *et al.*, 2017; Francois & Hoekman, 2010). A number of studies focused on the impact of various dimensions of services trade on the labour market, in terms of employment and wages for the various categories of workers involved.

Existing works on services trade and labour market outcomes have concentrated on the role of services imports or services offshoring. These studies identify theoretical mechanisms with opposite implications with respect to the impact of services imports on employment. On the one hand, importing foreign services lowers input prices, potentially increasing production and labour demand (scale effect). On the other hand, higher quality or cheaper service inputs may substitute for labour used in production, leading to a decrease in labour demand (substitution effect) (Amiti & Wei, 2005; Milberg & Winkler, 2010; and Winkler, 2010).

Consistent with this theoretical ambiguity, the results of empirical analyses at the sectoral level are mixed. Amiti & Wei (2005) find a positive correlation between services offshoring and employment in the UK between 1995 and 2001. Focusing on US sector-level data Amiti & Wei (2006) identify a negative effect of services offshoring on employment. This negative impact vanishes if a less disaggregated sector classification is used, suggesting that there is sufficient growth in labour demand in sub-sectors within these broader categories to offset the negative effect. In the case of Germany Schöller (2007) and Winkler (2010) find a negative impact of services offshoring on low-skilled labour in manufacturing sectors. Milberg & Winkler (2010) and Milberg & Winkler (2015) extend this analysis to OECD countries and show that negative impacts are attenuated by the existence of labour market institutions that reduce economic insecurity.

However, related empirical country case studies analyzing firm level data tend to point to a systematically positive impact of services imports on downstream employment, in particular on high skill labour demand. These works include Crinò (2010) for the US case, Michel & Rycx (2012) for Belgium, Andersson *et al.* (2016) for Sweden, Eppinger (2019) for Germany and Ariu *et al.* (2019b) for Finland.

Less is known on the employment effect of services export performance on firms' employment outcomes. Theoretically, services exports in manufacturing sectors are part of the process of "servitization" (Vandermerwe & Rada, 1988), i.e. non-services firms including services in their

domestic sales and export, typically in association with a good. This might trigger higher demand for goods exports from the same firm, which can use services as a lever to diversify its output with respect to competitors on the international markets. Therefore, higher services exports can be associated with higher demand opportunities and market power, which in turn might increase labour demand. While Ariu *et al.* (2019c) find evidence of the positive role of services exports to increase exports of goods, demand opportunities and market power for the population of Belgian firms, the implications on employment remain understudied. One exception is the empirical study by Nordås *et al.* (2019). These authors use Swedish micro data on firms and individual workers and show that services exports (as well as imports) stimulate labour demand, in particular of skilled workers.

The analysis presented in this paper contributes to this research strand by investigating the relationship between services trade performance and employment characteristics in Italian firms.

Our analysis is at the micro level and descriptive in nature. We merge micro data on services trade transactions with employment and wage variables at the level of the firm. We find that firms engaged in services trade tend to employ a larger share of managers and white collars and to pay higher average wages. They also exhibit systematically smaller shares of blue collars in their employment structure. These patterns hold qualitatively across all main sectors of firms' affiliation and across sectors of traded services. We complement basic descriptive exercises with regression analyses that allow to control for several observable and unobservable heterogeneity originating in sector, province and year idiosyncratic shocks. Overall, the evidence provided suggests that services trade positively commove with firm employment and wages.

The remaining of this report is structured as follows. Section B presents the data. Section C offers a descriptive analysis of the patterns of services trade of Italian firms. Section D presents the analysis of the linkages between the extensive margins of services trade and labour outcomes (employment and wages). The correlations with the intensive margins are in section E, including also regression analyses to control for many unobserved factors. Section F concludes.

B. Micro data

The analysis conducted in this report centers on the linkages between services trade performance and employment characteristics of Italian firms. The source of services trade data is the TTN (*Transazioni Trimestrali Non Finanziarie*, i.e. Quarterly Non-financial Transactions) section of the Direct Reporting (TTN-DR, henceforth) database managed by the Bank of Italy. The database includes information on exports and imports of services at the transaction level recorder for each quarter starting from the beginning of 2008. These transactions cover mostly mode 1 and to some extent mode 4 services trade. Modes 2 and 3 are excluded.[1] The TTN-DR is a survey with sampling weights, which we will use in the ensuing analysis (for more details on the survey design, see the Appendix).

The TTN-DR provides a detailed classification of services (about 50 categories), which follows the Extended Balance of Payments Services Classification (EBOPS). For sake of clarity, we regroup them in 9 macro categories: communication; finance & insurance; computer and ICT services; intangibles; trade related services; professional (including professional and management consulting services, as well as architectural, engineering, and other scientific and technical services); research and development (R&D); other business services (including waste management, agricultural and mining services); personal and recreational services.

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[1] The General Agreement on Trade in Services (GATS) identifies and disciplines 4 modes of services trade. Mode 1 captures arms-length cross-border trade (e.g.: services cross the border through the internet). Mode 2 is for consumption abroad (e.g. travels). Mode 3 considers services exported through the establishment of a commercial presence in the importing country (i.e. Foreign Direct Investment, FDI). Mode 4 describes trade through the temporary movement of the exporter's personnel in the importing country. Comprehensive discussions of the four modes can be found in Francois & Hoekman (2010) or WTO (2019).

Importantly the TTN-DR does not contain trade transactions in transport and travel services[2]. For the purpose of this report, we exclude international transactions in construction services, because these involve a limited number of firms. Following Federico & Tosti (2017) we do not report values for merchanting, defined as the purchase and subsequent resale of a good, without the good entering or leaving the borders.

Another important detail of TTN-DR microdata is that for each transaction it reports also the nationality of the counterpart. After excluding international organizations,[3] we remain with 220 countries as trade partners of Italian firms, about 12 per firm.

We merge the TTN-DR database with labour market data, taken from the Italian Social Security Agency INPS (*Istituto Nazionale di Previdenza Sociale*). The INPS data used in this paper covers the universe of Italian private firms. The variables of interest consist of the number of employees[4] and average monthly gross wage: they are available for each year as well as for five occupational categories: managers, white collars, blue collars apprentices" and the residual category "others". We focus only on the first three categories, which comprise the large majority of workers; they also reflect clear occupational tasks.[5]

Finally, we combine this information with balance sheet and profit & loss data available from the CADS dataset (Company Accounts Data Service), which includes data of all incorporated firms in Italy. Table 1 reports the percentage shares of firms in the resulting database by turnover category, after merging the three databases. Note that we find a small percentage of firms with a turnover below 10 million, the lower threshold in the sampling design, because of changes in turnover after sampling. In order to avoid outliers and to work with a homogeneous population we only consider firms with actual turnover above Euro 10 million.

Table 1: firms by turnover over time (percentage shares of sample population)

turnover (millions of Euros)	years										average
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
<=10	1.6	1.7	3.2	2.3	3.3	3.9	3.8	5.8	5.8	6.6	3.9
10-70	4.3	5.8	15.1	13.9	12.8	13.5	14.3	13.2	13.6	13.6	12.2
70-90	6.9	14.1	9.1	8.9	8.0	7.4	7.7	7.4	6.7	5.9	8.2
90-165	35.2	34.9	29.4	30.3	29.7	30.2	29.0	27.5	26.1	27.2	29.8
>=165	52.0	43.6	43.2	44.6	46.2	45.0	45.2	46.1	47.7	46.7	45.9
Total	100	100	100	100	100	100	100	100	100	100	100

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[2] Transport and travel services data are collected by the Bank of Italy in other *ad hoc* surveys, conducted on carriers and travelers, respectively.

[3] We exclude international organizations, as we want to focus on nations as trade partners for transactions of Italian firms.

[4] In the ensuing analysis, we refer to the total number of employees also as total employment. In theory, the two terms may differ because some firms do not have employees, but only the owners working at the firm. Nevertheless, the difference is relevant only for firms of very small size (less than 10 workers) and not in this case, where the sampling design of TTN excludes very small firms.

[5] Due to lack of a clear-cut interpretation of the content of the remaining two categories, we do not report category-specific results for them but we do not remove them from the data when considering the total employment level and the average wage.

C. Patterns of Services Trade

Definitions

In the ensuing analysis, we examine the relationship of labour outcomes with the intensive and the extensive margins of services trade. As for the latter, we cannot use the typical measure of whether a firm trades services or not in a given year, because a large part of the firms in the dataset are sampled. We resort to a definition of traders that is less likely to be just a function of a contingent shocks or sampling biases. We classify each firm based on performance observed for a firm-specific **relevant period** that we set equal to half of the years each firm is included in the sample. The relevant classes are given by the following definitions:

- **Traders**: firms that registered at least one services trade transaction (either export or import) in a number of years that is at least equal to the relevant period; all firms that do not belong to this category are considered **non-traders**;

- **Importers**: firms that imported services for a number of years at least equal to the relevant period;

- **Exporters**: firms that exported services for a number of years at least equal to the relevant period;

- **Super-traders**: firms that contemporarily imported and exported services for a number of years at least equal to the relevant period.

Descriptive statistics

Around 80% of firms in the reference population are engaged in services trade activities (either export and/or import) within the period of analysis (2008-2017). Almost all traders were also importers, while only about one trader every two is an exporter. Almost all (around 91% on average over time) services exporters were also importers, and thus denoted here as super-traders. Figure 1 below shows the percentage shares of traders, importers, exporters and super-traders over time. Note that from the beginning to the end of the 10 years period of analysis the share of exporters has remained substantially stable, while the percentage of importers increased approximately by 5 perc. points.

Figure 1: Percentage shares of services trade categories over time
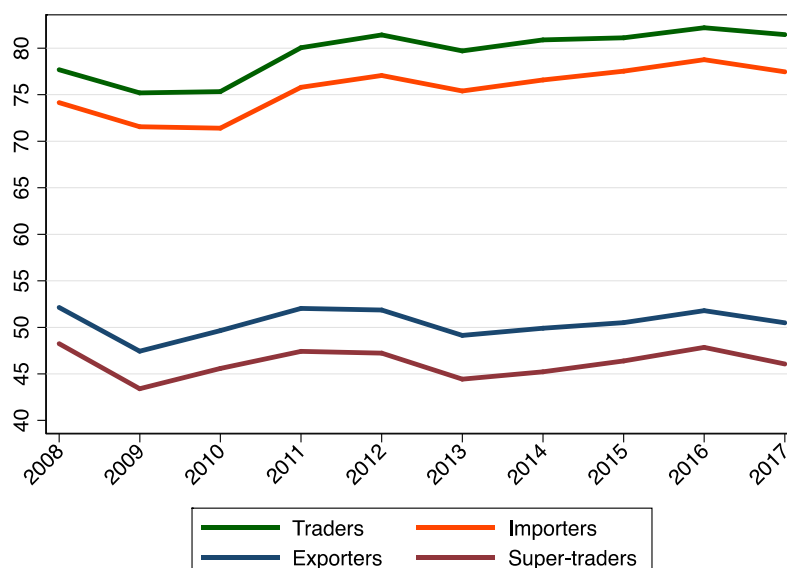
Among traders, there is some heterogeneity across sectors. Table 2 reports the percentage share of traders, exporter, importers and super-traders within six broad sectors reflecting firms' main sectoral

affiliation. The percentage shares are computed over the total population of firms represented over the whole period 2008-2017.

Table 2: Percentage shares of services trade categories across sectors of firm affiliation

Sector	Traders %	Importers %	Exporters %	Super-traders %
Agriculture	74.9	72.7	22.1	19.9
Mining	99.0	98.1	79.6	78.6
Manufacturing	87.4	83.6	58.9	54.8
Services	76.2	72.2	48.6	43.9
Construction	56.9	49.5	22.1	18.3
Utilities	58.6	55.9	21.8	18.2

The percentage of traders is higher among manufacturers (which comprise more than the half of the sampled firms) than for firms producing services (the second sectoral category in terms of number of firms in the sample) and this difference is slightly bigger for importers than for exporters. More in general, services trade is very frequent also among non-services sectors (for example among the primary sectors). These data highlight the pattern of servitization of Italian firms: Table 2 shows that many firms export services, even if services are not their main sector of affiliation.[6]

Table 3 reports the percentage share of traders, exporter, importers and super-traders across the sector of traded services. The percentage shares are computed over the total population of firms within the period 2008-2017 and they represent the share of the reference population engaged in sector-specific services trade. For instance, only 2% of the reference population within the whole period 2008-2017 has contemporarily imported and exported communication services. Services are sorted by the percentage share of sector-specific traders (column 1). The top three sectors in terms of all classes of services trade performance are "Professional"[7], "Other business services"[8] and "Trade related services".

The percentage of traders is highest in services related to general business activities of the firms, as for example in the three services categories where the percentage of traders is above 40% (Professional, Other business services and Trade related services). These are services related to a general business activity, in the sense that their provision (either buying or selling) may regard firms producing any kind of product (e.g.: a manufactured good, a primary product or a service provision).

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[6] Servitization is relevant phenomenon in many developed economies, especially those with a comparative advantage in services. See Bernard *et al.* (2017) where the case of Danish firms switching sector from manufacturing to services due to high levels of servitization id discussed. See also National Board of trade (2012) and Lodefalk (2013) for a discussion of servitization.

[7] Professional services include: legal services; accounting, auditing services and fiscal consultancies; management consultancies and public relations services; advertisement, market research and opinion poll services; architect services, engendering services; other technical and scientific services.

[8] This category includes waste management services, agricultural services, extraction and mining services, services offered by foreign embassies and consulates, services offered by foreign militaries, services from other foreign governmental bodies and other business services not elsewhere specified. Note that since the "Other Business Services" EBOPS is a very heterogeneous item, in our analysis we split it in three components: R&D, "Professional services and the "Other business services"

Table 3: Percentage shares of services trade categories across services sectors

Services sector	Traders %	Importers %	Exporters %	Super-traders %
Professional	48.6	45.9	17.6	14.7
Other business services	48.4	43.9	24.5	20.6
Trade related services	41.9	38.6	14.6	11.7
Computer (ICT)	39.1	37.5	7.9	6.3
Finance and insurance	26.6	24.9	7.5	5.9
Intangibles	24.9	21.8	8.7	5.5
Communication	15.9	15.3	2.6	2.0
Personal recreation	11.8	11.3	1.6	1.2
R&D	9.7	7.6	4.0	2.1

The data in the TTN-DR allow identifying the nationality of the importing/exporting counterpart of each international transaction in services markets. 47% of total services imports by Italian firms in the sample (average values over the years) is accounted for by the top 5 exporters (Germany, UK, France, Spain and US) and 70% by the top 10 ones (top 5 and Switzerland, Ireland, Netherlands, Belgium, Turkey). As for exports, the top 5 destination countries of Italian services (Switzerland, France, UK, Germany and US) account for 51% of overall exports from the firms under analysis, and the top 10 countries (top 5 and Belgium, Netherlands, Ireland, Spain and Turkey) for 69% of their exports. These countries are almost identical to the top importer and exporter countries of goods (see Table A.1 in the Appendix). This result reflects the fact that trading services is sometimes an ancillary activity to trading goods, confirming the importance of servitization for Italian firms.

Looking at the extensive margins, Italian firms have increased the number of the partner countries in services trade. Indeed, in the initial year (2008) the average Italian firm exported services to 10 countries and imported from 12.[9] These figures increased almost steadily over time. In 2017 the average number of export destinations raised to above 12 in 2017, and to 14 for imports (Figure 2). The trend has been positive also for the other two statistics considered (median and maxima, with the exception of the maximum value of export markets.

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[9] The median values are 4 and 7, respectively. Maximum values were about 220 for export markets and 190 for import markets.

Figure 2: Number of trade partner countries of Italian firms
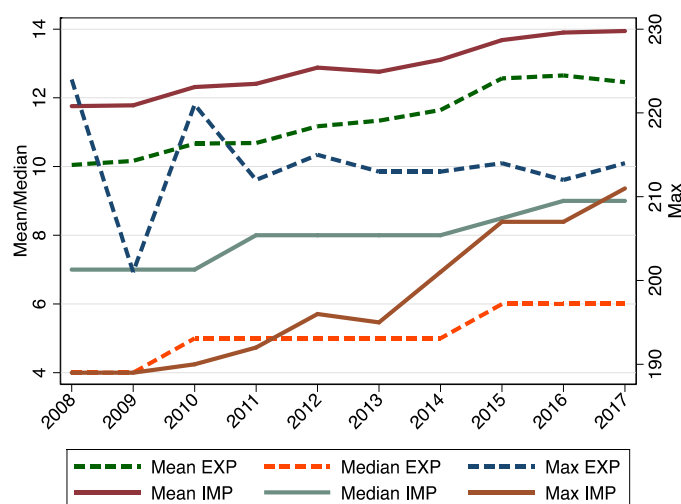
With regard to the extensive margins on the services dimension, Italian firms have had a very stable behavior over time. They export on average in 2 services sectors (with an almost identical median value of 1 only for the years 2009 and 2011) and a maximum of 9 or 10 sectors depending on the year. On the import front the mean number increases to 3.5 (median 3) with a maximum value always equal to 10.

D. Employment, wages and the extensive margins of services trade

In this section, we provide a descriptive analysis of the empirical relationship between services trade performance and labour market outcomes at the firm level, focusing on the extensive margins of trade. To this aim, we use the categorization of firms in terms of services trade performance defined above (non-traders, traders, importers, exporters, super traders). As discussed in the Introduction, we expect exporting services to be positively correlated with firm employment (especially of white collars) and firm average wages. Differently, there is no clear theoretical prediction on the direction of these correlations when focusing of services imports. On the one hand services imports may increase firms' productivity (cheaper inputs). On the other, they may also exert a substitution effect on firms' employment (especially in substitution of less skilled workers).

We start by reporting the average value of employment and wages[10] for all firms (Table 4). We further disentangle employment and wages into the three main occupations: managers, white collars and blue collars.

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[10] When not otherwise specified employment is measured in units. Wages are expressed in Euros and they are deflated using the Harmonized CPI, with 2008=1.

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Table 4: Average employment and wages by firm type of services trade performance and by occupation

Panel A: Employment

	units				percentage values		
	All	Manager	White collar	Blue collar	Manager	White collar	Blue collar
All firms	667.9	13.7	363.8	254.3	3.9	60.1	32.9
Non traders	492.7	6.0	243.8	206.3	3.0	58.4	35.5
Traders	714.2	15.7	395.0	267.3	4.1	60.6	32.3
Exporters	836.1	20.2	478.7	296.3	4.5	63.0	29.5
Importers	724.6	16.0	405.9	266.6	4.1	60.8	32.1
Super traders	850.0	21.3	503.8	286.4	4.6	63.6	28.9

Panel B: Wages

|	Euros				ratios		
	All	Manager	White collar	Blue collar	Manager	White collar	Blue collar
All firms	3,071.1	11,410.4	3,100.1	2,142.5	100,0	100,0	100,0
Non traders	2,789.4	10,879.6	2,873.7	2,125.6	95.3	92.7	99.2
Traders	3,143.3	11,526.2	3,158.5	2,146.9	101.0	101.9	100.2
Exporters	3,257.7	11,645.3	3,216.0	2,141.1	102.1	103.7	99.9
Importers	3,155.9	11,543.6	3,169.9	2,156.9	101.2	102.3	100.7
Super traders	3,296.4	11,688.9	3,244.8	2,156.4	102.4	104.7	100.6

Non-traders employ fewer workers and pay lower wages across all occupational categories than traders.[11] This result is consistent with the view that non-traders may have lower levels of productivity than firms involved in services trade. Indeed, trading services, similarly to trading goods, implies overcoming various types of fixed costs (especially of regulatory nature for services: see Francois & Hoekman, 2010 and WTO, 2019), which are compatible only with higher levels of firm productivity (Melitz, 2003 and Breinlich & Criscuolo, 2011). On the opposite, super traders employ slightly more workers and pay slightly higher wages than services exporter or importer firms. Finally, exporters on average are associated with larger employment and higher wages than importers. This last result is consistent with the potential substitution effect of services imports on firms' labour demand (Fiorini *et al.*, 2018).

Figure 3 provides a graphical representation of the percentage values of employment by firm category, as reported in the last three columns of panel A. This figure shows that non–traders employ a larger share of blue collars than all other occupational categories and that the share of white collars is largest among super-traders.

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[11] The only exception to this pattern is wages of blue-collar workers, which are very similar across all five types of services trade performance (see Panel B). This result might depend on blue collars wages being determined in Italy, more often than white collars and managers, by collective bargaining.

Figure 3: Employment shares by occupation across types of firms
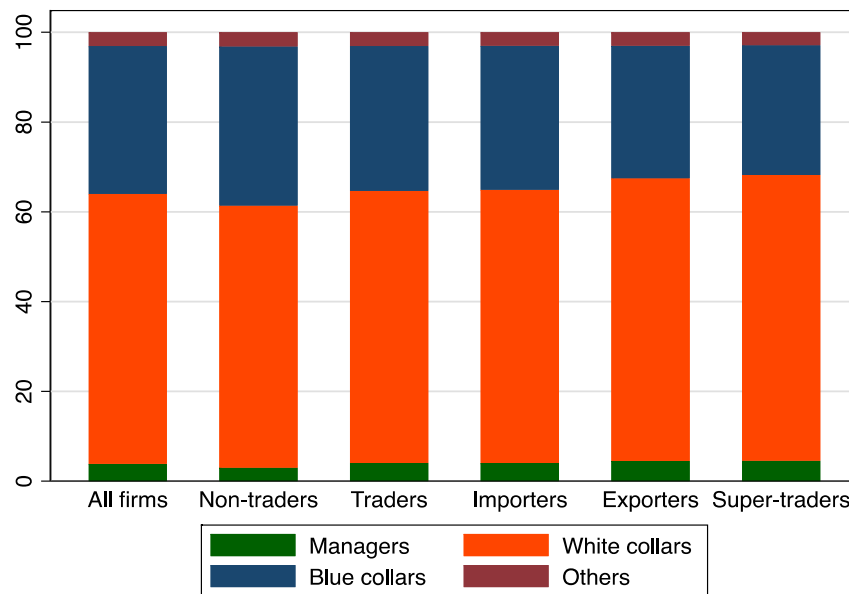
To sum up, the descriptive analysis conducted so far shows that services trade activities are associated with larger total employment and slightly higher wages, across the main occupational categories. This is especially evident for exporting firms. Indeed, exports of services, particularly for manufacturers, is a tool to achieve product differentiation and might as well foster a larger scale of operation of the firm (Ariu, *et al.*, 2019c and Nordås *et al.*, 2019). Also importing services improves firm labour outcomes, even though with lower improvements than for exporters. This last result is consistent with evidence showing how access to services intermediates from international markets might have a scale-effect on firms' activities (see for instance Eppinger, 2019). Finally, services trade activities are associated with a different occupational composition of the workforce in favor of managers and white collars, and this pattern is stronger among exporters.

In the Appendix we further split the sample of firms to investigate whether the results of Table 4 are be driven by the domestic or foreign ownership of the firms (Panels A and B of Table A.2).[12] Indeed, a recent work by Moro & Tosti (2019) highlights the role of foreign-controlled companies in spurring exports of services among Italian firms in recent years. The results are also disentangled by turnover level (panels C and D). Overall, the previous patterns are broadly confirmed across all panels of Table A.2.[13] Appendix Figure A.3 looks at the relationship between firm type and employment through the lens of the distribution of employment and wages within categories of services trade performance by plotting the distribution of log employment for traders (in green) and non-traders (white). This reveals a rightward shift in the employment distribution of traders with respect to that of non-traders. These patterns hold for each occupational category: managers, white and blue collars (Appendix Figure A.4).[14]

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[12] This information is taken directly from the TTN-DR database.

[13] Some notable exceptions emerge only for foreign owned firms: super-traders employ less workers, and in particular white collars than super-traders of domestic business groups; *ii)* the share of blue collars is relatively stable does not vary across firm categories and their average wage is systematically higher for trader firms. This last observation is valid also for firms above the sample median of turnover.

[14] Additional figures comparing employment and wages between non-traders and all other categories of services trade performance are available upon request.

Analysis across broad sectors of firms' affiliation and sectors of traded services

We check whether and how heterogeneity across sectors of firms' affiliation as well as across sectors of traded services are associated with heterogeneous labour outcomes. We first consider 5 broad sectors of firms' affiliation (Agriculture, Mining, Manufacturing, Services and Utilities), and 10 sectors of traded services. In Table 5, we replicate the analysis of Table 4, by reporting the average level of employment and the average wage by firm services trade performance (listed is the row dimension) and by occupational category (column dimension), splitting the sample into five aggregate sectors of firms' broad sectors.

The aggregate patterns of Table 4 are generally confirmed across all sectors also in this case: *i*) employment and wages of non-trader firms are smaller than in traders; *ii*) super traders employ slightly more workers and pay slightly higher wages than services exporters or importers;[15] *iii*) exporters' average employment and wages are higher than for importers. This last result is consistent with various works that find that offshoring services may dampen employment when they start importing services from abroad (Amiti & Wei, 2006; Winkler, 2010); moreover, it explicitly considers the role of services exports. As noted in the Introduction this has not been explored much in in the literature.[16]

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[15] Few exceptions to the previous results emerge. In agriculture, exporters and super traders employ much fewer blue collars and pay them lower wages than non-traders pay. This might be a sign of specialization of services exporters in the agricultural sector away from tasks that are blue collar intensive. Average employment in utilities is higher in non-traders than in traders: in this sector, firms are predominantly controlled by local public governments and as such subject to over employment.

[16] Appendix Table A.3 further disentangles the data using the three occupational categories.

Table 5: Average employment and wages by firm type of services trade performance and sectors of firms' affiliation

	Agriculture	Mining	Manufacturing	Services	Utilities
Employment *(units)*					
All firms	284.7	1,755.4	592.9	769.5	671.9
Non traders	263.1	271.7	351.6	569.7	703.3
Traders	296.2	1,765.3	628.1	833.6	651.8
Exporters	205.5	2,151.7	728.5	937.2	1,236.7
Importers	295.5	1,779.7	627.4	853.4	669.4
Super traders	195.8	2,166.0	734.7	955.6	1,402.1
Wages *(euros)*					
All firms	3,187.6	4,460.7	3,030.6	3,030.8	3,463.1
Non traders	3,021.2	2,617.8	2,802.2	2,650.9	3,050.3
Traders	3,234.3	4,474.1	3,063.4	3,149.8	3,753.4
Exporters	3,016.3	4,650.4	3,175.8	3,289.0	4,092.0
Importers	3,235.8	4,491.8	3,073.8	3,172.6	3,686.7
Super traders	3,020.2	4,668.0	3,200.0	3,355.8	3,988.8

Finally, Table 6 reports the analysis replicated by splitting firms into the five categories with respect the sector of traded services. The main patterns of Table 4 are generally confirmed also in this case, with the exception of the category of Trade related services.[17]

Analysis over time

The analysis so far has been conducted using data averaged over the sample period 2008-2017. This time interval includes important events, such as the (goods) trade collapse of 2008-2009 and the sovereign debt crisis of 2011-12. In this subsection we investigate the evolution of labour outcomes over time and across the five categories of services trade performance. Figure 4 plots total employment for each of the 5 types of services trade performance (as well as for all firms in the reference population). Over the entire period of analysis, employment remained quite stable, with the exception of 2009 (the year of the collapse of trade in goods) and a slightly less relevant decline in 2011, at the inception of the sovereign debt crisis and in 2016, a followed by a strong rise of employees. In general, the allocation of labour across types of services trade performance remained rather stable: average employment of traders increased slightly, involving both exporters and importers. The positive gap widened somewhat with respect to non-traders, for which the number of employees was quite stable during the all period.[18]

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[17] In the Appendix we replicate this analysis by occupational categories: see Tables A.4 and A.5.

[18] The employment share in non-trader firms over all firms increased slightly until 2011, reaching a peak of more than 17%; then it slowly decreased until 2016 to 12.8%, and increased slightly in 2017 to 13.3%.

Table 6: Average employment and wages by firm type of services trade performance and sectors of traded services

	Professional services	Other business services	Trade related services	Computer (ICT)	Finance and insurance	Intangibles	Communication	Personal recreation	R&D
	Employment *(units)*								
Non traders	574.7	515.6	734.5	545.2	648.6	603.9	636.0	605.7	663.3
Traders	813.5	849.1	719.9	896.9	870.5	977.5	1,075.4	1,383.0	1,157.1
Exporters	949.5	990.8	770.0	1,221.7	983.8	1,196.0	1,389.5	1,668.6	1,193.3
Importers	812.9	867.0	742.2	910.5	816.5	966.9	1,066.1	1,399.5	1,211.1
Super traders	1,010.4	1,021.4	862.0	1,381.3	843.8	1,280.1	1,539.0	1,943.7	1,399.5
	Wages *(euros)*								
Non traders	3,049.2	2,983.4	3,291.7	3,030.8	3,018.0	3,121.5	3,100.8	3,070.4	3,127.9
Traders	3,199.0	3,238.1	3,019.5	3,249.9	3,382.8	3,192.6	3,311.1	3,547.5	3,252.9
Exporters	3,335.3	3,364.0	3,107.2	3,383.1	3,628.4	3,266.8	3,347.5	3,592.1	3,364.1
Importers	3,223.0	3,254.0	2,994.2	3,257.1	3,401.6	3,195.6	3,318.0	3,567.7	3,196.8
Super traders	3,426.7	3,427.7	3,076.7	3,471.0	3,756.8	3,308.8	3,500.6	3,428.2	3,332.6

In terms of employment shares of each specific category (compared to all firms in our population), employees of non – trader firms have been constantly less than 20 per cent of total employment. Moreover, the slight increase of the share of traders' employees during the latter years is mostly due to importers.

Figure 4: Employment by services trade performance category and occupational category
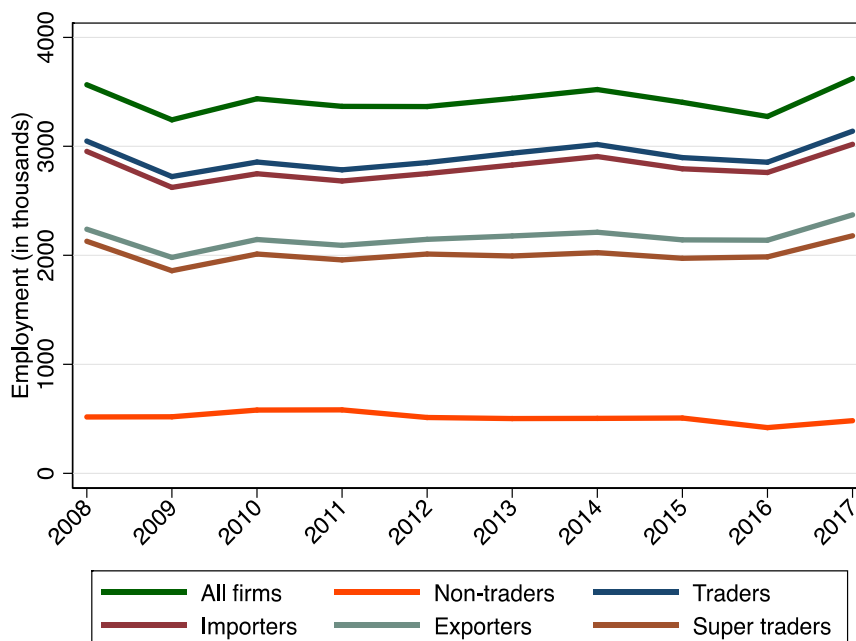
When we replicate the analysis for each occupational category (see Figure A.1 in the Appendix), we highlight three additional patterns. First, for each category of workers there is more variability of employment levels among firms trading services than among non-traders. Second, white collars employment increases slightly over time among traders, while they decrease among non-traders. Third, super-traders account less and less for blue collars among services trading firms.

Figure 5 instead plots the wage level by occupation category and by classes of services performance. In general, average wages are even more stable than employment over the whole period and across all categories of services trade performance. The only exception is non-trader firms, where managers' wages increase substantially over the sample period, even though they remain at lower levels than traders (Panels A and B).
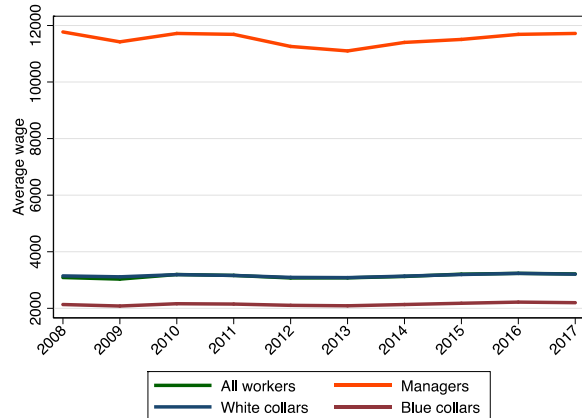
Overall, this section reveals that there is some variability of labour outcomes over time which is more relevant for employment than wages and for firms involved in services trade. Trading in services favors employment of white collars, while it does not for blue collars.

Figure 5: Average wages by occupation
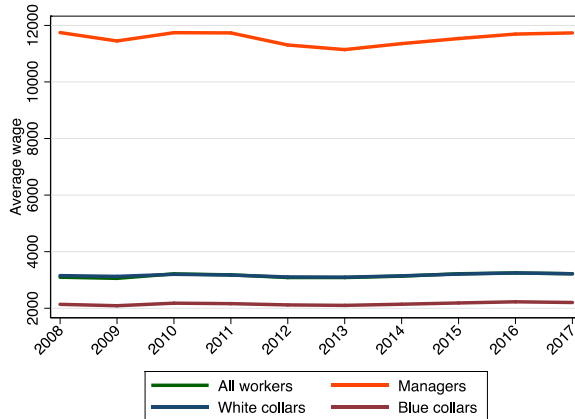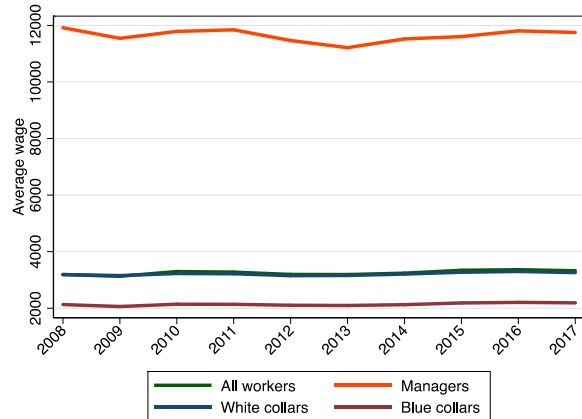
Panel A: Non-traders'
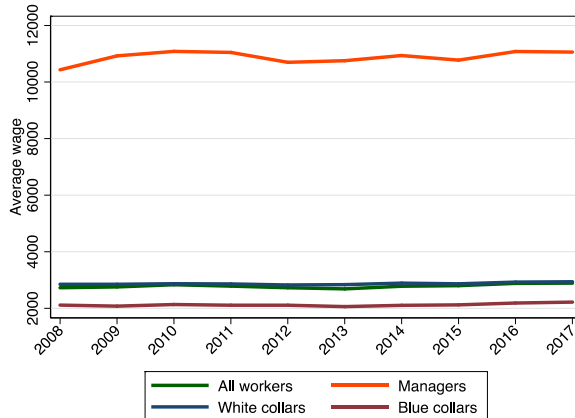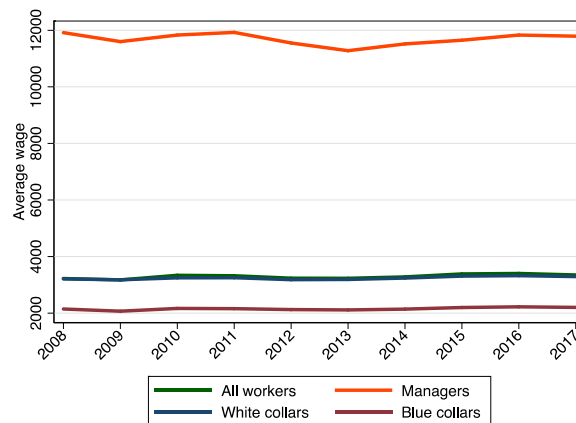
Panel B: Traders'

Panel C: Importers'

Panel D: Exporters'


Panel E: Super traders

E. Labour outcomes and the intensive margin of services trade

We now move to a descriptive analysis of the correlations between labour outcomes and the intensive margin of services trade. We start by looking at whole period averages at the firm level. Figure 6 plots

the log values of total employment against the log of total services trade (imports plus exports). The correlation is positive (0.194) and significantly different from zero.[19]

Figure 6: Total employment and services trade values (log-log relationships)



Elasticity = 0.194
p-value = 0.000
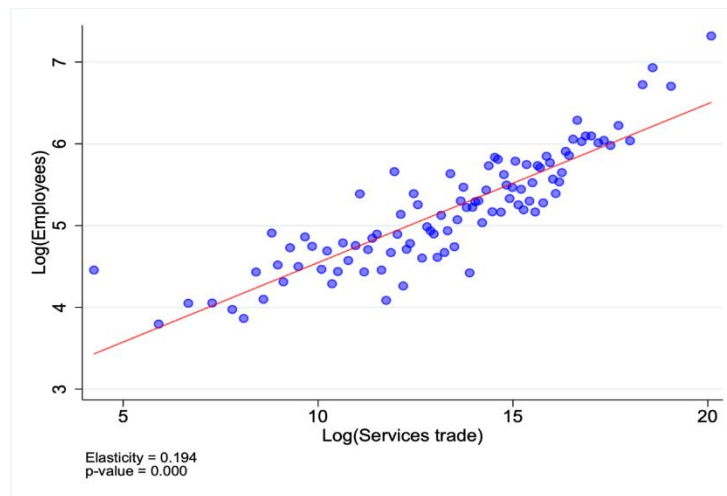
We repeat the analysis disentangling services trade value into exports and imports in Figure 7 (Panels A and B, respectively).

Figure 7: Total employment and services exports and imports values (log-log relationships)

Panel A: Employment and total services exports   Panel B: Employment and total services imports

Elasticity = 0.139   Elasticity = 0.207
p-value = 0.000   p-value = 0.000
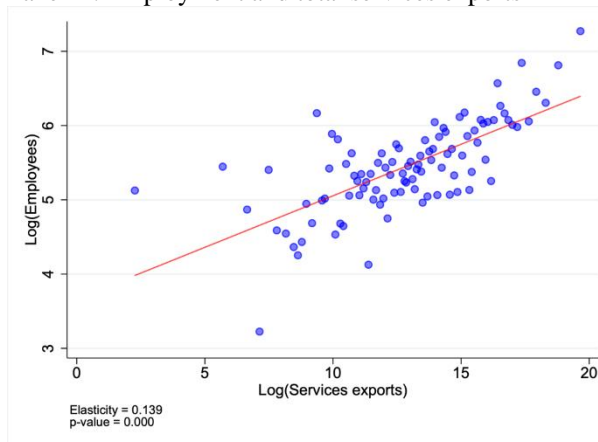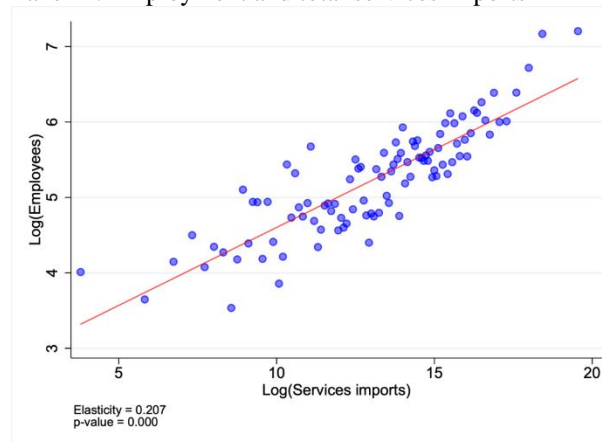
Again, the estimated correlations are both positive and statistically significant. Contrary to the previous analysis (see the first column of Panel A in Table 4) which suggested higher levels of employment in the population of exporters as opposed to importers, the estimated correlations using the intensive margins of trade flows tone down this pattern. In other words, once we take into account the amount of services traded, the positive correlation between employment and services trade is stronger for imports than for exports.

[19] For the sake of clarity in an empirical context with a large number of observations the scatterplots in this section are binned. They have been generated using the binscatter command in STATA. Since the command does not allow for the use of weights, the coefficients and p-values reported below each scatterplot are instead derived from bivariate regressions featuring the appropriate survey weights.

Moreover, we replicate the scatterplots presented above by replacing the level of services trade with a measure of services trade intensity obtained by dividing the value of services trade by firms' turnover (see Figure A.5). The estimated correlation between total trade (imports plus exports) intensity and total employment is positive and significant (Panel A). Considering the two direction of trade flows separately, the correlation between services trade intensity and employment is stronger for imports than for exports as in the case of trade values.

Finally, we replicate this graphical analysis for wages as well as for each occupational category (managers, white collars, blue collars).[20] These exercises highlight three additional patterns. First, as already hinted by Figure 7, we find a stronger association of employment and wages with imports rather than exports which appears to be stable across all occupational categories. Second, we confirm a relatively weaker, though positive, relationship between services trade (both values and intensity) and blue-collar wages and employment. Finally, we find the strongest positive correlation with trade performance in the case of mangers employment and wages (see for instance the case of managers employment and services imports plotted in Figure 8, with an estimated correlation of 0.255).

Overall, these correlations show that services trade values and intensities positively commove with skilled labour (especially managers, but also white collars) and their wages, while their association with low-skilled (e.g.: blue collars) outcomes is generally weaker. This is very consistent with the other firm-level country case studies discussed in the Introduction.

Figure 8: Log employment of managers and log services imports

Elasticity = 0.255
p-value = 0.000
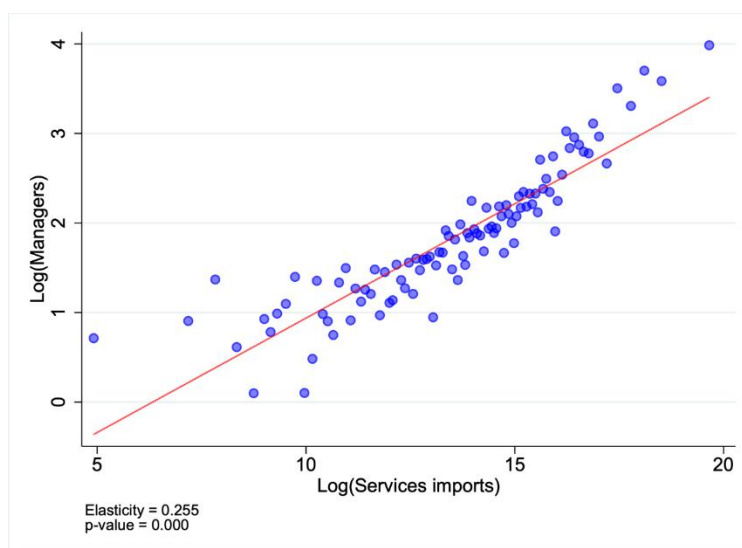
Regression analysis

In this subsection, we further investigate the relationship between services trade performance, employment and wages using regression analysis. Our purpose is to improve upon the descriptive analysis conducted above by exploiting the full structure of the data which allows to account for various sources of potentially confounding heterogeneity.

We take the log of total employment y_{ijpt} valued for firm i (active in sector j and located in the Italian province p) at time t as the dependent variable in a linear regression framework. We regress y_{ijpt} on firm-time-level indicators of services trade performance x_{ijpt}. In the following analysis x_{ijpt} will is equal in turn to (i) the log of services exports; (ii) the log of services imports; (iii) the vector of log

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[20] Scatter plots for other employment categories as well as for wages are available upon request.

services exports and log services imports; and log of total services trade (exports plus imports). For each version of x we propose the following two specifications:

$$y_{ijpt} = \alpha + \boldsymbol{\beta}' \boldsymbol{x}_{ijp(t-1)} + \varepsilon_{ijpt} \tag{1}$$

$$y_{ijpt} = \alpha + \boldsymbol{\beta}' \boldsymbol{x}_{ijp(t-1)} + \boldsymbol{\delta}' \boldsymbol{k}_{ijpt} + \xi_j + \xi_p + \xi_t + \xi_i + \varepsilon_{ijpt} \tag{2}$$

where $\boldsymbol{k}_{ijpt}$ is a vector of controls that includes firm age, the log of capital intensity and the log of goods trade.[21] In the regression equation (1) the vector of coefficient(s) $\boldsymbol{\beta}$ is identified using all variation in the data. In the second specification instead, we add a buttery of fixed effects (ξ_j, ξ_p, ξ_t, and ξ_i are respectively sector, province, time and firm fixed effects) to reduce the potential risk of endogeneity coming from omitted variables. The estimation results are showed in Table 7.

Finally, we replicate these specifications by replacing services trade values with the corresponding intensity measures, computed as the log of 1 plus the ratio between the relevant services trade value (export or import or total trade) and firm total sales. The estimation results are reported in Table 8.

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[21] For both capital intensity and goods trade, we take the values lagged by one year. Data on goods trade are from the CADS dataset, which reports for the total value of total exports of the main sector of activity of the firm (no further details on the countries of destination, nor of products is available). To ensure that the values of this variable refer only to goods exports (not exports of services), we consider positive values of firms in the industrial sectors (mining and manufacturing) and set the value to zero for services firms using the main sector code (NACE Rev. 2). Some data are missing because exports are surveyed only for a subsample of limited liability firms (joint stock companies).

Table 7: Services trade (value) and total employment

Dep. variable:	log of total employment							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Services exports	0.0446***	0.0041***			0.0324***	0.0026**		
	[0.0044]	[0.0011]			[0.0045]	[0.0011]		
Services imports			0.0451***	0.0100***	0.0259***	0.0093***		
			[0.0054]	[0.0020]	[0.0058]	[0.0020]		
Services trade							0.0470***	0.0096***
							[0.0057]	[0.0020]
Firm Age		-0.0110***		-0.0115***		-0.0114***		-0.0117***
		[0.0023]		[0.0023]		[0.0023]		[0.0023]
Goods exports		0.0025**		0.0022*		0.0023*		0.0024*
		[0.0012]		[0.0012]		[0.0012]		[0.0012]
Capital intensity		0.1371***		0.1353***		0.1353***		0.1360***
		[0.0295]		[0.0291]		[0.0292]		[0.0292]
Observations	15,607	15,607	15,607	15,607	15,607	15,607	15,607	15,607
R-squared	0.044	0.970	0.036	0.970	0.052	0.970	0.037	0.970
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes
Number of firms	2511	2511	2511	2511	2511	2511	2511	2511

All estimates use OLS and include a constant (unreported). Estimates were made using the reghdfe estimator of S. Correja. All variables are in logs, except firm age. Province and sector fixed effects are included in the estimations in columns 2, 4, 6 and 8. However they are lergerly collinear with firm-fixed effects as there are very few sector changes and province changes within firm. Robust standard errors clustered at the firm-level are reported in square brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Services trade intensity and total employment

Dep. variable:	log of total employment							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Services exports	0.6338*	0.1073			0.5643	0.0346		
	[0.3618]	[0.0993]			[0.3518]	[0.0981]		
Services imports			0.4969	0.1673*	0.1379	0.1530*		
			[0.4043]	[0.0923]	[0.3925]	[0.0918]		
Services trade							0.5864**	0.1439*
							[0.2863]	[0.0871]
Firm Age		-0.0113***		-0.0111***		-0.0111***		-0.0112***
		[0.0023]		[0.0023]		[0.0023]		[0.0023]
Goods exports		0.0025**		0.0025**		0.0025**		0.0025**
		[0.0012]		[0.0013]		[0.0013]		[0.0012]
Capital intensity		0.1374***		0.1372***		0.1372***		0.1372***
		[0.0294]		[0.0294]		[0.0294]		[0.0295]
Observations	15,607	15,607	15,607	15,607	15,607	15,607	15,607	15,607
R-squared	0.001	0.970	0.001	0.970	0.001	0.970	0.002	0.970
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes
Number of firms	2511	2511	2511	2511	2511	2511	2511	2511

All estimates use OLS and include a constant (unreported). Estimates were made using the reghdfe estimator of S. Correja. All variables are in logs, except firm age. Province and sector fixed effects are included in the estimations in columns 2, 4, 6 and 8. However they are lergerly collinear with firm-fixed effects as there are very few sector changes and province changes within firm. Robust standard errors clustered at the firm-level are reported in square brackets. *** p<0.01, ** p<0.05, * p<0.1

The patterns of correlation highlighted in the previous sections are mostly confirmed in the regression analyses that exploit the whole variation in the data (see columns 1, 3, 5 and 7 of each table). Table 7 shows that firms with higher services trade exports, imports and total trade systematically have higher levels of total employment. In general, the elasticity of employment to services trade performance is between 0.025 and 0.05 for exports, imports and total trade. The coefficients are smaller when exports and imports are simultaneously included in the specification (column 5 of Table 7). The positive relationship between total trade and employment is robust when using our measure of services trade intensity (Table 8, column 7), but the magnitude of the elasticity changes substantially, raising to 0.59. Differently, services export and import intensities are respectively less and not significantly associated with total employment.

As a second step, we test whether these relationships on the overall variation may be confounded by observable and/or unobservable characteristics at the firm-, sector-, province- and year-level, by adding fixed effects for each of these dimensions. The results of these more demanding estimations are reported in columns 2, 4, 6 and 8 of both tables. Table 7 shows that services trade exports, imports and total trade are significantly associated with firms' total employment, but the magnitude of the relationship is smaller. As for services trade intensities (columns 2, 4, 6 and 8 of Table 8), we find positive coefficients, but with low (for imports and total trade) or absent statistical significance (exports).

As a robustness check, we have repeated these estimates excluding firm fixed effects. The idea here is that there is an ex ante selection of firms due to the sampling design so that firm fixed effects may be restricting excessively the variation in the data. Indeed, the dataset is built with the aim of capturing most of the services trade phenomenon (about 95%, see Appendix A.1). This comes at the cost of substantially under sampling firms of lower size or excluding them completely (if they have a turnover below 10 millions of euros). Estimates using trade value regressors are reporter in Table 9 and they broadly confirm the pattern discussed above.[22]

Table 9: Services trade (value) and total employment

Dep. variable:	log of total employment			
	(1)	(2)	(3)	(4)
Services exports	0.0185***		0.0138***	
	[0.0032]		[0.0031]	
Services imports		0.0190***	0.0120***	
		[0.0044]	[0.0045]	
Services trade				0.0203***
				[0.0047]
Firm Age	0.0028***	0.0026**	0.0027***	0.0026**
	[0.0010]	[0.0010]	[0.0010]	[0.0010]
Goods exports	0.0158***	0.0159***	0.0153***	0.0157***
	[0.0039]	[0.0039]	[0.0038]	[0.0038]
Capital intensity	0.3162***	0.3172***	0.3150***	0.3171***
	[0.0349]	[0.0344]	[0.0345]	[0.0345]
Observations	15,607	15,607	15,607	15,607
R-squared	0.549	0.548	0.551	0.549
Sector FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No
Number of firms	2,511	2,511	2,511	2,511

All estimates use OLS and include a constant (unreported). In order to make results comparable with previous results, estimates were made using the reghdfe estimator of S. Correja. All variables are in logs, except firm age. Robust standard errors clustered at the firm-level are reported in square brackets. *** p<0.01, ** p<0.05, * p<0.1

We have replicated these exercises using as dependent variables employment by occupation, firms' share of managers, white collars and blue collars, the log of average wages of all employees and of each of three occupational categories. The results of previous sections are largely confirmed as long as we do not rely exclusively on within-firm variation. Finally, we have also derived estimates using sector times year fixed effects in order to capture shock which are idiosyncratic to each sector at each point in time. The previous results are confirmed also in this case.[23]

To sum up, the economic implications of our estimates is that higher volumes of services trade are strongly and robustly associated with higher levels of total employment. The relationships between service trade measures and other labour market outcomes discussed above are instead driven by time-invariant firm characteristic and tend to disappear when we control for any observable and/or unobservable firm-specific time invariant characteristic in our regression analysis. Therefore, even though, for instance, high average wage firms show systematically better services trade performances, higher levels or intensity of services trade in the same firm are not associated with higher average wages.

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[22] The only exception is for the effect of services imports intensity (columns 6, 7 and 8) which is not significant in this less demanding specification.

[23] All regression tables are available upon requests.

F. Conclusions

This paper has been written in close collaboration with the Services Trade Division of the OECD with the specific purpose to contribute to the OECD research agenda on the analysis of services trade at the micro level in member countries. While the material presented here is limited in scope and analytical breadth (it is mainly descriptive in nature), this is the first study on the relationship between services trade and labour outcomes (employment and wages) in Italy.

Our analysis sheds light on the correlation patterns between the value and intensity of services traded (exports, imports and both) and total employment and the average wage at the level of the firm. The analysis also considered employment shares and wages for three main occupational categories: managers, white collars and blue collars. The main patterns highlighted by our descriptive analysis confirm the positive relationship between services import performance and employment at the firm level. Moreover, they support the finding of services exports being also positively associated with higher employment levels and higher wages. Finally, our estimates reveal that firms with higher services trade performance employ relatively more managers and white-collar workers, a result that is consistent with existing evidence from other countries. Further research is needed to unpack the nature of these relationships, and in particular, the direction of causality between services trade performance and employment characteristics. This research has important policy implications, as suggested by recent work that highlights the presence of a large and untapped potential for services trade liberalization, especially in the context of domestic, non-discriminatory, behind the border barriers (WTO, 2019). Estimating the causal effect of services trade performance on the employment composition of Italian firms could provide useful insights that can shape the national efforts and agenda in the design of services trade policy. This important exercise goes beyond the scope of this paper and is left as a topic to future research.

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Appendix

Micro data: TTN-DR

The TTN-DR is a survey.[24] However, it covers the universe of firms with a yearly turnover equal or superior to the threshold of Euro 165 million. According to the survey design described in Bank of Italy (2016), the database and the associated probability weights are defined to be representative of the population of Italian firms (across all sectors of the economy, excluding financial firms but including insurance firms) with an annual turnover above Euro 10 million. The survey design also features two strata. The first one consists of Italian firms above the 10 million turnover threshold that have executed a cross-border transaction with a foreign entity though an Italian bank. These firms are listed in the Supervisory Reports (Matrice dei Conti) a register containing detailed information of Italian banks, mainly for supervisory purposes. About 80% of sample observations are taken from this group. The second stratum consists of Italian firms above the 10 million turnover threshold and that are not listed in the above described register. The TTN-DR is compiled with the purpose of identifying the bulk of the phenomenon of services trade as the database is used to compute the `services' values in the current account of Italy's balance of payments (Federico & Tosti, 2017).[25]

Services classification in the TTN-DR provides a detailed classification of services (about 50 categories), which follows the Extended Balance of Payments Services Classification (EBOPS).

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[24] The methodological note on the survey design is available in Italian at https://www.bancaditalia.it/statistiche/basi-dati/bird/transazioni-internazionali/BIRD_Nota_metodologica_090117.pdf (Bank of Italy, 2016).

[25] According to Bank of Italy (2016), the subset of the reference population in the TTN-DR which consists of firms above a 90 million turnover threshold for the first stratum plus the firms above a 165 million turnover threshold for the second group account for about 95% of services trade.

Table A.1: Country rankings (1) of exports and imports of services and goods (2)

Ranking	Services		Goods	
	Imports	Exports	Imports	Exports
1	Germany	Switzerland	Germany	Germany
2	UK	France	France	France
3	France	UK	China	US
4	Spain	Germany	Netherlands	Spain
5	US	US	Spain	UK
6	Switzerland	Belgium	Russia	Switzerland
7	Ireland	Netherlands	Belgium	Belgium
8	Netherlands	Ireland	US	Poland
9	Belgium	Spain	Switzerland	China
10	Turkey	Turkey	UK	Turkey

(1): rankings are computed on average values over the period of analysis: 2008-29017. (2): data on services are from the sample of firms used in this work (TTN), data on goods trade are aggregate level (source: ISTAT).

Table A.2: Average employment and wages by firm type of services trade performance and occupation: exploring heterogeneity across firms' ownership and size

	Employment (numbers)				Employment (percentage shares)			Wages			
	All	Man	White	Blue	Man	White	Blue	All	Man	White	Blue
Panel A: Domestic											
All firms	647.2	11.5	340.9	262.2	3.4	58.3	35.0	2914.3	11226.3	2993.6	2115.1
Non traders	469.0	5.4	219.7	211.2	2.9	57.5	36.5	2735.0	10727.1	2838.5	2127.4
Traders	706.1	13.5	380.2	279.6	3.5	58.5	34.5	2971.7	11362.7	3044.0	2111.6
Exporters	898.5	18.6	495.7	338.4	4.0	60.7	31.7	3062.9	11506.2	3073.7	2080.5
Importers	717.6	13.9	393.6	278.1	3.5	58.9	34.3	2987.8	11394.7	3056.6	2122.6
Super traders	931.4	19.9	535.0	330.5	4.1	61.5	30.9	3108.8	11579.4	3104.9	2093.4
Panel B: Foreign owned											
All firms	733.0	20.4	435.4	229.8	5.4	65.9	26.5	3560.0	11891.7	3432.2	2239.9
Non traders	711.1	11.3	460.3	166.6	4.5	65.6	26.9	3260.4	11924.8	3182.4	2110.5
Traders	735.5	21.2	433.4	235.6	5.5	65.9	26.4	3587.5	11888.1	3455.3	2251.1
Exporters	715.0	23.5	445.8	214.3	5.5	67.4	25.3	3634.9	11885.6	3491.3	2270.8
Importers	742.0	21.2	436.5	238.2	5.4	65.8	26.7	3572.1	11861.0	3450.8	2252.7
Super traders	707.1	23.5	449.2	208.6	5.4	67.3	25.5	3624.8	11862.1	3489.7	2276.2
Panel C: Above median turnover											
All firms	1389.7	26.5	799.2	476.1	4.1	67.3	25.5	3278.4	12251.3	3201.3	2206.9
Non traders	974.0	11.5	509.1	342.6	3.1	65.2	28.0	2886.4	11203.8	2915.0	2166.6
Traders	1481.1	29.8	862.4	505.7	4.3	67.8	25.0	3363.8	12459.6	3263.5	2215.7
Exporters	1660.9	36.5	982.9	556.6	4.6	68.8	23.8	3479.7	12610.2	3340.7	2214.6
Importers	1490.8	30.3	879.9	499.8	4.3	68.0	24.8	3376.2	12480.0	3272.9	2228.2
Super traders	1657.1	37.9	1023.4	520.3	4.7	69.6	23.1	3513.9	12666.6	3361.5	2230.6
Panel D: Below median turnover											
All firms	344.0	7.9	167.8	155.2	3.8	56.9	36.3	2977.9	10985.4	3054.8	2117.7
Non traders	310.0	4.0	141.6	155.8	3.0	55.7	38.4	2754.2	10751.9	2859.2	2112.2
Traders	354.5	9.0	175.5	155.7	4.0	57.2	35.7	3039.2	11039.8	3109.2	2119.0
Exporters	394.5	11.5	208.3	157.1	4.5	59.8	32.6	3138.2	11091.1	3149.2	2105.8
Importers	357.5	9.1	178.5	155.3	4.0	57.4	35.6	3049.5	11048.3	3120.5	2127.6
Super traders	403.0	12.0	215.9	156.7	4.5	60.3	32.2	3175.2	11118.2	3180.1	2119.9

We split firms using sample medians of turnover computed for every year. Firms-year observations are assigned to the Panel C or D samples depending on the value of turnover in each year.

Table A.3: Average employment shares and wages by services trade performance and occupational categories

	Employment (percentage shares)			Wages		
	Managers	White collars	Blue collars	Managers	White collars	Blue collars
Panel A: Agriculture						
All firms	4.0	57.5	35.9	10,980.8	3,204.9	2,376.6
Non traders	3.4	51.3	42.0	11,347.4	3,234.9	2,452.9
Traders	4.1	59.4	34.3	10,875.4	3,192.9	2,346.8
Exporters	3.6	60.8	34.0	9,486.5	3,079.9	2,302.5
Importers	4.1	59.8	33.8	10,930.9	3,196.1	2,334.9
Super traders	3.6	62.0	32.7	9,590.0	3,078.3	2,274.6
Panel B: Mining						
All firms	6.0	74.8	13.2	13,374.9	4,161.3	3,099.3
Non traders	1.5	59.0	39.5	8,342.9	2,741.6	2,219.2
Traders	6.0	74.9	13.0	13,517.1	4,174.2	3,106.1
Exporters	7.5	70.4	15.0	13,678.0	4,260.4	3,151.2
Importers	6.1	75.1	12.8	13,517.1	4,188.9	3,114.8
Super traders	7.5	70.6	14.9	13,678.0	4,275.1	3,160.0
Panel C: Manufacturing						
All firms	3.5	45.6	48.7	11,058.7	3,295.5	2,205.9
Non traders	3.4	40.0	54.4	10,936.5	3,121.9	2,186.8
Traders	3.6	46.4	47.9	11,073.1	3,320.0	2,208.7
Exporters	4.0	49.8	44.0	11,161.0	3,367.6	2,213.2
Importers	3.6	46.6	47.8	11,110.2	3,327.0	2,216.1
Super traders	4.0	50.3	43.6	11,221.4	3,382.2	2,223.4
Panel D: Services						
All firms	4.0	73.0	18.9	11,900.2	2,860.6	1,933.2
Non traders	2.9	67.0	26.3	11,046.0	2,616.2	1,900.2
Traders	4.4	74.9	16.6	12,114.6	2,937.9	1,944.6
Exporters	4.9	77.5	13.7	12,214.9	3,009.0	1,927.8
Importers	4.5	75.4	16.1	12,108.2	2,953.8	1,956.2
Super traders	5.1	78.7	12.4	12,231.5	3,050.6	1,943.2
Panel E: Utilities						
All firms	3.6	66.5	28.5	11,518.9	3,329.8	2,681.0
Non traders	1.7	60.1	37.3	10,407.5	3,101.4	2,654.9
Traders	4.9	70.9	22.3	12,270.3	3,489.7	2,701.4
Exporters	6.4	69.8	22.6	13,634.0	3,673.9	2,746.7
Importers	3.9	71.2	23.0	12,352.3	3,496.0	2,701.4
Super traders	3.9	70.5	24.4	14,059.9	3,749.1	2,772.4

Table A.4: Average employment shares by services trade performance, occupational categories and sectors of traded services
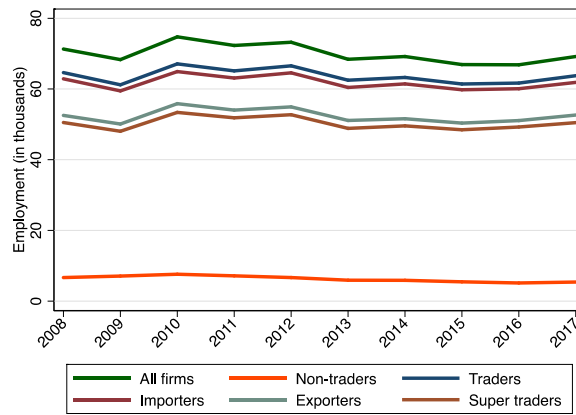
	Employment (percentage shares)								
	Managers	White collars	Blue collars	Managers	White collars	Blue collars	Managers	White collars	Blue collars
	Professional services			Other business services			Trade related services		
Non traders	3.6	62.8	30.7	3.5	60.9	32.3	4.8	68.9	22.8
Traders	4.4	59.1	33.5	4.4	60.2	32.6	3.5	53.4	40.7
Exporters	5.3	62.3	29.1	4.9	61.2	31.2	3.9	55.5	38.4
Importers	4.4	59.0	33.6	4.4	60.1	32.8	3.4	52.5	41.6
Super traders	5.6	63.0	28.2	4.9	61.4	31.1	3.8	54.2	39.7
	Computer (ICT)			Finance and insurance			Intangibles		
Non traders	3.8	57.6	35.7	3.8	58.0	35.2	4.0	60.8	32.2
Traders	4.3	63.1	29.5	4.6	65.0	27.4	4.2	59.9	32.9
Exporters	4.8	65.3	26.8	5.6	72.3	19.5	4.9	56.1	35.7
Importers	4.3	63.3	29.3	4.6	65.7	27.0	4.2	61.3	31.5
Super traders	5.0	67.1	24.9	5.9	76.9	15.5	4.8	59.7	32.0
	Communication			Personal recreation			R&D		
Non traders	4.0	59.8	33.3	3.8	59.2	34.0	4.1	61.2	31.6
Traders	4.5	62.9	29.1	5.4	67.1	24.2	3.8	55.7	38.4
Exporters	4.3	72.3	18.8	4.8	70.1	23.5	4.0	57.5	37.4
Importers	4.5	62.5	29.6	5.4	67.0	24.3	3.8	54.8	39.1
Super traders	4.5	74.2	17.8	4.5	68.6	25.4	4.1	56.4	38.4

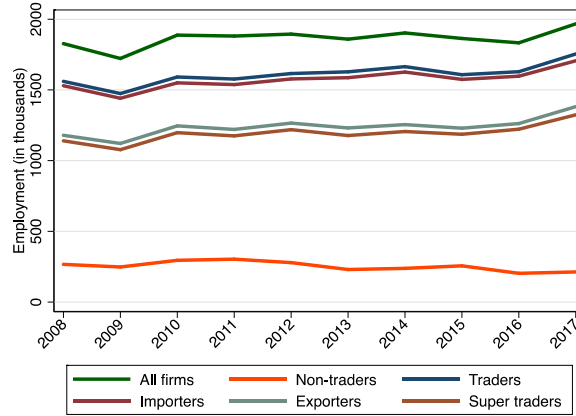**Table A.5: Average wages by services trade performance, occupational categories and sectors of traded services**

					Wages				
	Managers	White collars	Blue collars	Managers	White collars	Blue collars	Managers	White collars	Blue collars
	Professional services			Other business services			Trade related services		
Non traders	11,246.5	3,077.2	2,133.3	11,088.2	3,037.4	2,102.9	11,734.3	3,143.5	2,099.8
Traders	11,652.2	3,211.3	2,160.2	11,741.5	3,235.3	2,175.8	11,341.3	3,177.4	2,181.5
Exporters	11,950.4	3,244.0	2,123.1	11,960.6	3,301.9	2,182.6	11,413.2	3,211.5	2,192.0
Importers	11,701.2	3,232.2	2,167.5	11,746.0	3,260.2	2,185.0	11,267.6	3,169.3	2,182.9
Super traders	12,063.4	3,303.6	2,132.8	12,019.4	3,357.8	2,200.9	11,285.7	3,204.2	2,200.3
	Computer (ICT)			Finance and insurance			Intangibles		
Non traders	11,086.3	3,113.2	2,125.7	11,249.1	3,078.8	2,117.7	11,344.0	3,133.4	2,158.3
Traders	11,881.0	3,207.8	2,174.7	11,998.9	3,320.1	2,219.7	11,837.0	3,222.3	2,138.1
Exporters	12,252.2	3,284.2	2,144.7	12,737.9	3,341.6	2,108.8	12,545.2	3,256.6	2,066.0
Importers	11,878.9	3,211.8	2,179.9	12,011.3	3,327.1	2,230.9	11,772.1	3,218.6	2,140.3
Super traders	12,386.5	3,335.3	2,178.8	12,922.9	3,376.2	2,132.4	12,754.7	3,263.9	2,025.3
	Communication			Personal recreation			R&D		
Non traders	11,375.8	3,134.5	2,154.8	11,360.8	3,123.0	2,142.3	11,520.0	3,125.8	2,138.9
Traders	12,032.2	3,268.1	2,136.1	12,314.8	3,375.0	2,197.0	11,518.6	3,409.1	2,215.5
Exporters	11,846.5	3,211.4	2,051.1	13,666.1	3,395.3	2,077.1	11,106.3	3,535.0	2,225.3
Importers	12,053.3	3,278.3	2,143.3	12,276.5	3,394.8	2,206.5	11,631.1	3,359.3	2,197.2
Super traders	12,092.7	3,284.9	2,079.3	12,925.7	3,361.9	2,027.3	11,296.7	3,513.2	2,170.8

Figure A.1: Employment by services trade performance category and occupational category
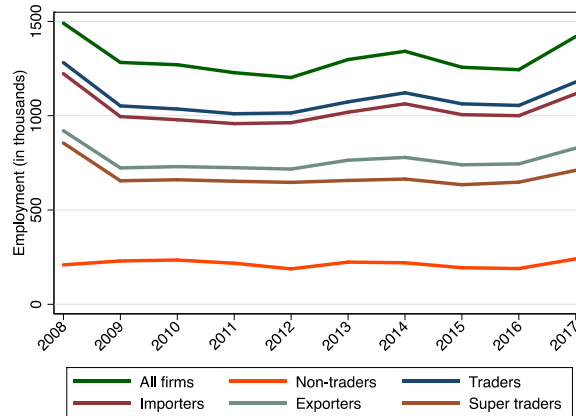
Managers

White collars

Blue collars

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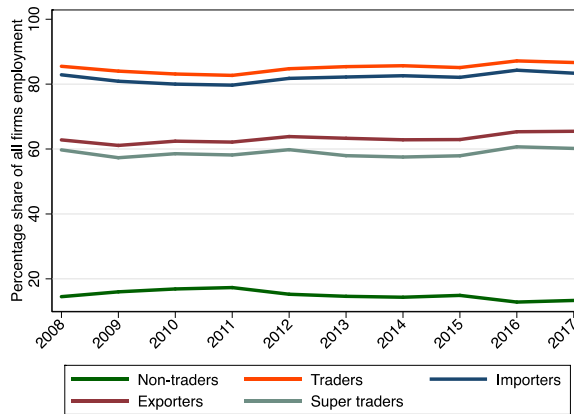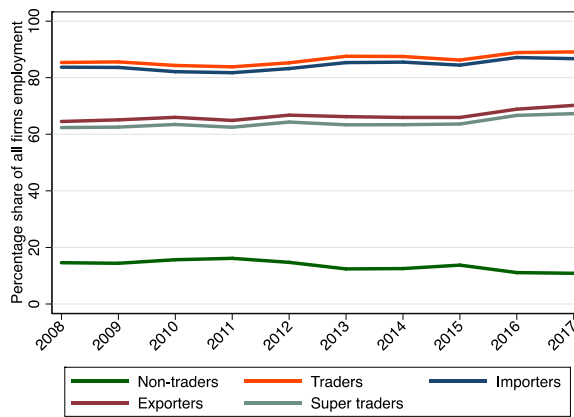
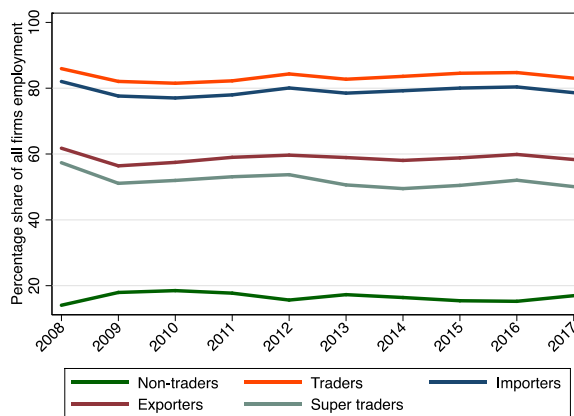**Figure A.2: Employment shares of services trade performance category by occupational category**

Managers

White collars

Blue collars

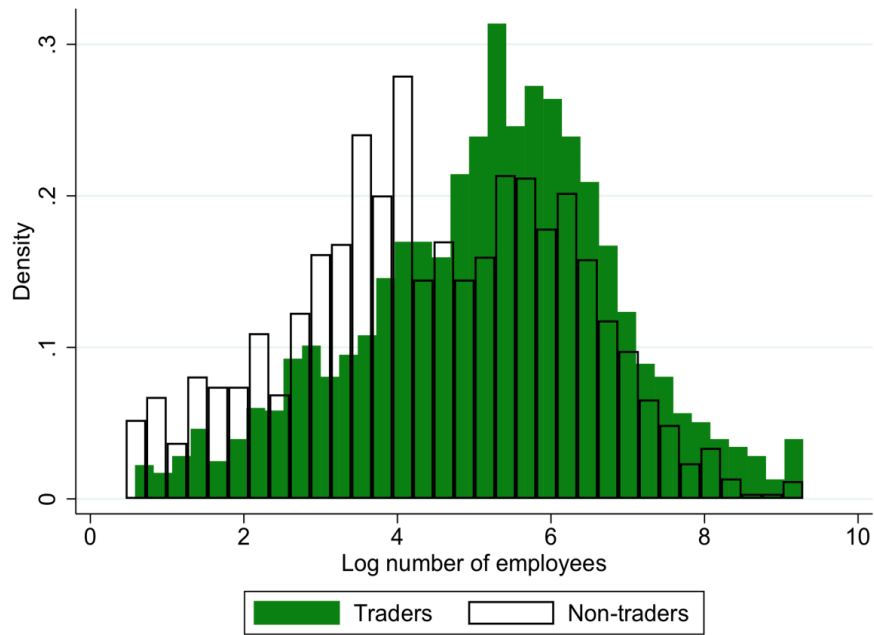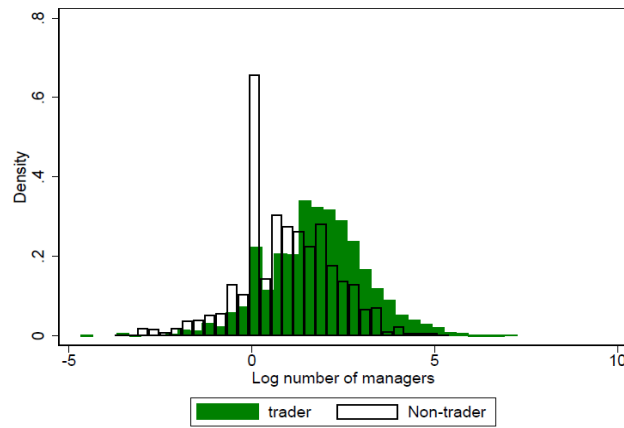**Figure A.3: Distribution of employment for traders and non-traders**

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Figure A.4: Distribution of employment for traders and non-traders by occupational category

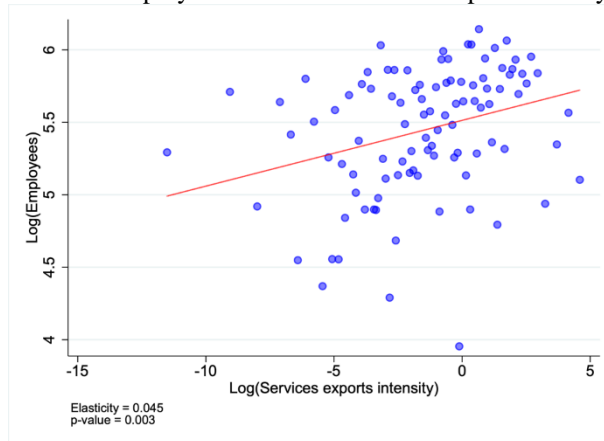Panel A: Managers

Panel B: White collars
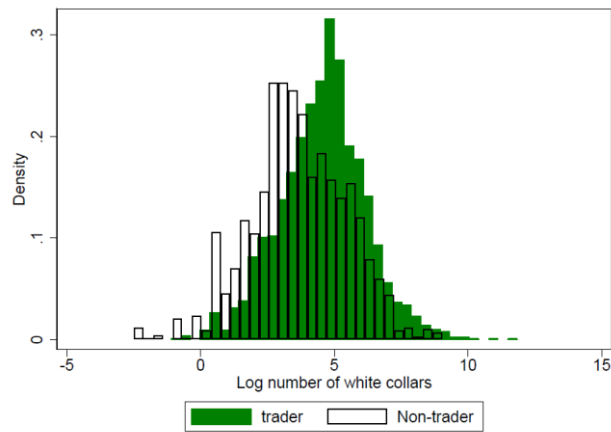
Panel C: Blue collars
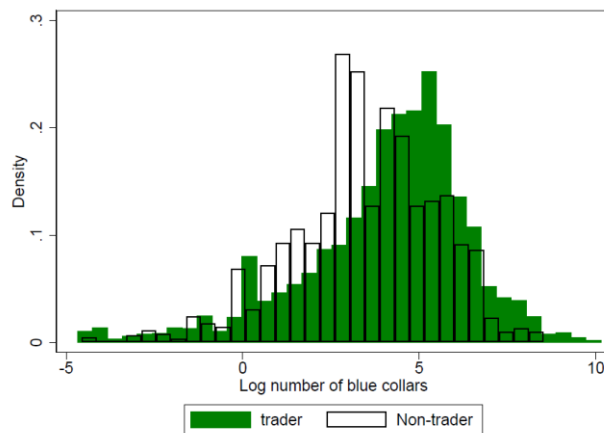
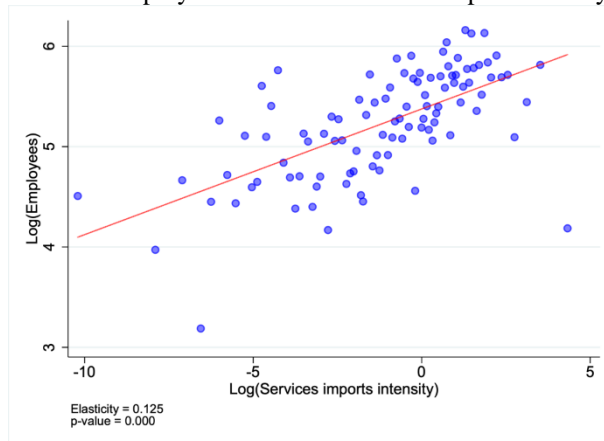**Figure A.5: Total employment and services trade intensity (log-log relationships)**

Panel A: Employment and total services trade intensity

Elasticity = 0.113
p-value = 0.000

Panel B: Employment and total services export intensity

Elasticity = 0.045
p-value = 0.003
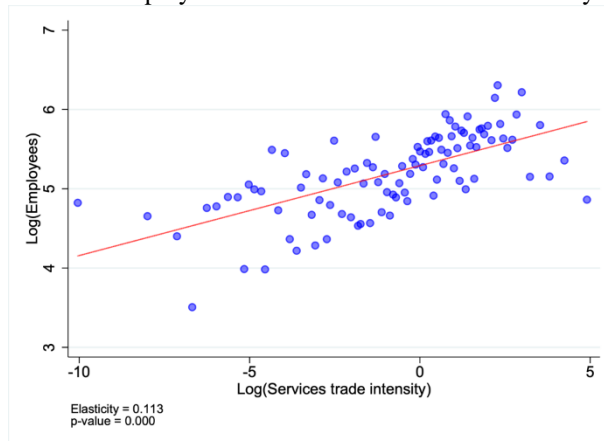
Panel C: Employment and total services export intensity

Elasticity = 0.125
p-value = 0.000

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