DISCUSSION PAPER SERIES

No. 8761

SERVICE TRADE AND OCCUPATIONAL TASKS: AN EMPIRICAL INVESTIGATION

Andrea Ariu and Giordano Mion

INTERNATIONAL TRADE AND REGIONAL ECONOMICS

Centre for Economic Policy Research

www.cepr.org

Available online at: **www.cepr.org/pubs/dps/DP8761.asp**

ISSN 0265-8003

SERVICE TRADE AND OCCUPATIONAL TASKS: AN EMPIRICAL INVESTIGATION

Andrea Ariu, Université Catholique de Louvain
Giordano Mion, London School of Economics and CEPR

Discussion Paper No. 8761
January 2012

Centre for Economic Policy Research
77 Bastwick Street, London EC1V 3PZ, UK
Tel: (44 20) 7183 8801, Fax: (44 20) 7183 8820
Email: cepr@cepr.org, Website: www.cepr.org

CEPR Discussion Paper No. 8761

January 2012

ABSTRACT

Service Trade and Occupational Tasks: An Empirical Investigation*

Using micro data for Belgium we investigate the relationship between occupational tasks changes and the rise of service trade. We focus the analysis on the extensive margin and look at the heterogeneous proliferation of firms involved in exports and imports of services across sectors characterized by different tasks changes patterns. Occupational tasks changes display an extremely consistent relationship with participation to service trade across firm groups pointing to strong churning effects. The change in analytical (interactive and routine cognitive) tasks intensity has a positive (negative) impact across the board meaning that, in industries characterized by larger changes, firms have experienced both higher (lower) likelihood of entry and exit. The negative relationship between the change in interactive tasks and service exports participation underlines the special role that proximity between demand and supply plays for services. Interestingly, we find exactly the opposite result (a positive relationship) between the extensive margin of goods exports and interactive tasks. Moreover, our analysis suggests that the change in IT use per se does not strike as being a key underlying force behind the increase in the extensive margin of service exports.

JEL Classification: F14, F16, L80 and O33
Keywords: extensive margin, occupational tasks, technological change and trade in services

Andrea Ariu
Université Catholique de Louvain
Dep. of Economics
d-215, place Montesquieu 3,
1348, Louvain la Neuve
BELGIUM

Email: andrea.ariu@uclouvain.be

For further Discussion Papers by this author see:
www.cepr.org/pubs/new-dps/dplist.asp?authorid=171095

Giordano Mion
Department of Geography and Environment
London School of Economics
Houghton Street
London WC2A 2AE

Email: G.Mion@lse.ac.uk

For further Discussion Papers by this author see:
www.cepr.org/pubs/new-dps/dplist.asp?authorid=157937

* This work has been produced for the 2010 bi-annual conference of the National Bank of Belgium (NBB). The views expressed in this paper are our own and do not necessarily reflect those of the NBB. The authors thank Andrew Bernard, Gianmarco Ottaviano, and Lindsay Oldenski for providing us with helpful insights, Daniela Rohrbach-Schmidt for assistance with the BIBB data, Christian Viegelahn for help with translation from German, and Alexandra Spitz-Oener for providing the STATA classification code for tasks. We also thank seminar participants at the 2010 NBB bi-annual conference meetings, 2nd GIST conference, the RES 2011 conference and 26th EEA conference for helpful comments and suggestions. All remaining errors are ours. Financial help under the Globalisation Investment and Trade in Services (GIST) project, funded by the EU 7th Framework Programme (ITN-2008-211429), is gratefully acknowledged by Andrea Ariu.

Submitted 19 December 2011

1 Introduction

Nowadays we live in the era of services: fifty years ago the service sector represented only 30% of GDP and a negligible share of trade while, according to Francois and Hoeckman (2010), it now accounts for 75% of GDP and in between 20% and 50% of total world trade. Services are the fastest growing component of trade over the past years, with a two-digit average annual growth rate.[1] With respect to our country of analysis, Belgium, during the period 1995-2005 the number of exporters of services has more than doubled and the total value of service exports has increased by 244%. These figures raise an intriguing and important question about the causes of this phenomenon.

Using micro data for Belgium, we investigate the relationship between occupational tasks changes, the change in the use of information technology (IT), and the rise of service trade. We focus the analysis on the extensive margin side of the issue, i.e., the change in the number of trading firms, and analyze the heterogeneous proliferation of firms involved in the export and import of services across different sectors. A widespread view is that the development of IT and the internet have expanded the range of internationally tradeable service products. In the words of Blinder (2009): "*Information and communications technology keeps getting both better and cheaper*" thus increasing the scope for trade in services. Our results uncover a rich pattern linking occupational tasks changes and the increase in firms' participation to service trade while at the same time questioning the common view about IT diffusion and the service trade boom.

Despite the major role that services are currently playing in world trade, they have received relatively little attention from the academic literature so far. On the theory side, services have traditionally been treated as a sector whose output is purely non-tradable. As a result, the existing body of research on international trade and trade policy is focused almost entirely on agriculture and (especially) manufacturing. On the empirical side, there is also a gap which is mainly due to the fact that data on trade flows and FDI in services across countries have become available only very recently. Our paper contributes to the literature on trade in services, recently surveyed by Francois and Hoeckman (2010), as well as to the empirical

[1] See (World Trade Organisation, 2008) for further details

trade literature focusing on firm-level trade and heterogeneity, recently surveyed by Bernard et al. (2011).

Most previous analyses have used aggregate service trade data. Freund and Weinhold (2002), who are no exception to the rule, study the impact of internet diffusion on the increase in the value of trade in services by focusing on cross-country data. Their research topic is closely related to ours, some of the key differences being that we focus on changes in occupational tasks, we use firm-level trade in order to look at the extensive margin, and concentrate on a single country (Belgium). The link between trade in services and the change in the task content of jobs has been previously analyzed by Oldenski (2010), albeit in a different setting. Using US sector-level data, Oldenski (2010) analyzes the determinants of the FDI vs. export decision in the context of services. She shows that the usual trade-off between economies of scale and proximity to the final consumer, which is recognized to be a key element in the exporting versus FDI strategy for manufacturing goods, does not apply to services. We share the same occupational tasks approach, but we use firm-level trade data and focus on the determinants of entry and exit into the export and import of services activities.

Our research is also related to recent descriptive studies of trade in services at the firm level started with Breinlich and Criuscolo (2011) for the UK and then extended by Kelle and Kleinert (2010) for Germany, Gaulier et al. (2010) for France, Federico and Tosti (2010) for Italy, and Walter and Dell'mour (2010) for Austria. All of these studies concur that service traders share many common features with goods traders in terms of export participation patterns, exports distribution, and firm characteristics. In our analysis we make use of similar firm-level data for Belgium and build on these studies in the choice of firm-level control variables. Our paper is also linked to the recent "task approach" developed by both labor economics and international trade. In particular, our framework is related to Baldwin and Robert-Nicoud (2010), Blinder (2006), and Grossman and Rossi-Hansberg (2008) for the international trade literature, and to Autor et al. (2003), Levy and Murnane (1996), Spitz-Oener (2006) and Autor and Acemoglu (2011) for the labor economics literature. Both strands consider the production process as a combination of different tasks. Grossman and Rossi-Hansberg (2008) argue that, in an era in which value added is created in different locations,

international trade can be considered more and more as trade in tasks rather than trade in goods. From the labor economics perspective, Autor et al. (2003), Spitz-Oener (2006), and Autor and Acemoglu (2011) document the remarkable change occurred in workers' tasks, both within and across occupations, during the last two decades and argue that IT has been a key driving force in this process.

In order to achieve our goals, we take advantage of a firm-level panel data on trade in services, along with standard balance sheet information, over the period 1995-2005 provided by the National Bank of Belgium (NBB). We complement our data with the BIBB-IAB labor force surveys that provide us with a time-varying measure of occupational tasks changes and IT use. The most striking feature of our results is that occupational tasks changes display an extremely consistent relationship with participation to service trade across firm groups pointing to strong churning effects. The change in analytical (interactive and routine cognitive) tasks intensity has a positive (negative) impact across the board meaning that, in industries characterized by larger changes, firms have experienced both higher (lower) likelihood of entry and exit. The negative relationship between the change in interactive tasks and service exports participation is particularly interesting and underlines the special role that proximity between demand and supply plays for services. Interestingly, we find exactly the opposite result (a positive relationship) between the evolution of the extensive margin of goods exports and the change in interactive tasks intensity.

Our estimations further suggest that the change in IT use does not translate into a significantly higher or lower firms' participation to service export. The negative (positive) impact of interactive and routine cognitive (analytical) tasks changes play in opposite direction and the overall balance is such that technological change does not strike as being a key underlying force behind the increase in the extensive margin of service exports. On the other hand, our estimations are consistent with offshoring being a key factor contributing to the rise of service trade. Though, the overall pattern and significance of tasks intensities changes are little affected hinting at other factors being at work.

The structure of the paper is as follows. In Section 2 we describe the data and the main variables we use. Section 3 provides some key facts about trade in services in Belgium. In

Section 4 we describe the econometric strategy, while in Section 5 we outline our core results. Section 6 is devoted to additional results and robustness checks. Finally, Section 7 concludes.

2 Data

2.1 What is Trade in Services?

Services are intangible flows that do not cross custom frontiers inside a package, therefore their measurement is more problematic and difficult to sort. The need for a common understanding led to the General Agreement on Trade in Services (GATS) classification where one can distinguish four modes of trade in services:

- Mode 1 (*Cross-Border*): when the service is produced in the territory of one country and consumed in the territory of another country;
- Mode 2 (*Consumption Abroad*): when the service is consumed in the territory of one country by the resident of another country;
- Mode 3 (*Presence Abroad*): when the service is provided by a supplier of one country through commercial presence in the territory of another country;
- Mode 4 (*Presence of Natural Person*): when the service supplier of one country, through presence of natural persons, provides the service in the territory of another country.

An example of mode 1 would be a call-center in India providing its services to a UK firm. Mode 2 could be medical services provided in Switzerland by a medical center to the employees of a French firm or simply services consumed by German tourists in Belgium. Mode 3 implies the commercial presence of one company in another country, which falls into the common definition of FDI. An example would be a US internet provider selling its services via an affiliate in Ireland. Finally, mode 4 could be an Italian firm sending one of its engineers to a Spanish company to provide maintenance services for some previously bought machines. Our firm-level service trade data contain information about modes 1, 2 and 4 to the extent that the foreign party is a business. Therefore, services consumed by German tourists in Belgium

are not part of our data. Moreover, the information we have does not allow us to distinguish these three different modes.

2.2 Data Sources

In our empirical analysis we analyze the link between occupational tasks changes over time and the participation of firms to trade in services. We consider a long difference approach and compare two points in time (1995 and 2005) with the years' choice being driven by both data availability and the need to work with a sufficiently long time span to observe significant changes in occupational tasks.

The data we use in our analysis comprise three main pieces. The first is a firm-level panel dataset containing balance-sheet information on Belgian firms over the period 1995-2005. The second consists of service trade data collected by the NBB on a monthly basis containing the universe of import and export transactions at the firm-level by service type and origin/destination. The third piece comes from the Qualification and Career Survey (QCS) collected periodically by the German Federal Institute for Vocational Training (BIBB) and the Research Institute of the Federal Employment Service (IAB). The data consist of five waves (1979, 1985/86, 1991/92, 1998/99 and 2006) from which we retrieve information on workers' occupational tasks and use of IT across industries and time.

Balance sheet data. Firm-level balance sheet data over the period 1995-2005 come from the Business Registry covering the population of Belgian firms required to file their (unconsolidated) accounts to the NBB. The data combine annual accounts figures with data from the Crossroads Bank on firms' main sector and legal status. Overall, most firms that are registered in Belgium (i.e., those that exist as a separate legal entity) and have limited liability are required to file annual accounts.[2] There are two types of annual accounts: full and abbreviated. Firms have to file a full annual account when they exceed at least two of the following three cutoffs: (i) employ at least 50 employees; (ii) have an annual turnover of more than 7.3 million euros; and (iii) report total assets of more than 3.65 million euros.

[2]Exceptions include sole traders and small companies whose members have unlimited liability as well as most of the public sector.

For this study, we consider all companies that filed a full-format or abbreviated balance sheet in 1995 and 2005. Starting with 178,069 firms in 1995, 55,515 are no longer in the data in 2005 ('exiters') while 156,007 new firms are present in 2005 ('entrants') and 122,554 are recorded in both years ('stayers'). We thus end up with 278,561 firms in 2005. In our analysis we make use of a number of firm-level control variables derived from these data: value added, employment in full time equivalent, wage bill, tangible assets, intangible assets,[3] and firm age. These variables are jointly available for 133,410 firms in 1995 and 130,280 firms in 2005 so allowing us to keep track of 35,755 exiters, 63,794 entrants and 95,723 stayers. The loss of information is essentially due to the unavailability of employment figures, which are not mandatory for small firms and are not recorded for firms with only self-employed, so that our data represent the bulk of Belgian firms' employment and sales. We further assign each firm, based on its NACE rev 1.1 5-digit main activity code, to one of the 30 sectors listed in Table 1. The choice of the sectoral disaggregation is dictated by the need to create a correspondence with the classification used in the QCS which provides us with measures of occupational tasks changes.[4] Table 2 provides summary statistics of the variables obtained from balance sheet data referring to the group of firms for which variables are jointly available.

Data on trade in services. Monthly Belgian service trade data by firm, service type (IMF code), and partner country are provided by the NBB. Being the country and product dimensions not relevant to our analysis, we thus concentrate on yearly exports and imports of services at the firm-level. In particular we consider two points in time: 1995 and 2005. Micro service trade data are collected by the NBB on a monthly basis from declarations submitted either by the firms themselves or by Belgian resident banks and financial companies involved

[3]Intangible assets include patents, licences, and R&D capitalized costs as well as goodwill.

[4]From the 42 sectors in the QCS we end up working with 30 because we exclude agriculture, fishery, and mining due to their little participation to service trade. Furthermore, banks (NACE rev 1.1 code 6512) and some insurance companies (NACE rev 1.1 code 6601 and 6603) are also excluded from our analysis because of the particular nature of their accounts which makes it impossible to measure some key control variables like value added and intangible assets.

in the transaction.[5] More precisely, whenever a Belgian resident makes (receives) a payment to (from) a non-resident above a certain amount,[6] banks and financial firms involved in the payment are obliged to gather detailed information and file it on a monthly basis to the NBB. Both the IMF code of the traded service and the country of the non-resident are recorded along with the value of the operation and the identifier (VAT code) of the Belgian resident.

We merge balance sheet and service trade data using the VAT number which uniquely identifies firms in Belgium. Due to the aforementioned requirements to file annual accounts, we loose track of about 20% (15%) of service trading firms in 1995 (2005). However, these are essentially small firms and/or firms which have a VAT number but do not exist as a separate legal entity in Belgium,[7] so that in the end we are able to cover around 80% (90%) of total traded values in 1995 (2005). Considering the merged data, we end up with 4,079 firms exporting services in 1995 and 8,490 in 2005. Figures for imports are similar: 3,783 firms in 1995 and 6,018 in 2005. These numbers show that the number of exporters and importers in Belgium increased respectively by 108% and 59% over ten years. Both numbers are remarkably large given the time span considered and the size of Belgium.

We treat exports and imports of services separately. In the case of exports we couple information on firms' entry and exit with export participation and divide firms into the following categories: (i) for both exiters and entrants we distinguish between exporters and non-exporters based on their export status in, respectively, 1995 and 2005; (ii) we divide stayers into four subcategories: firms that do not export in both 1995 and 2005 (never exporters), export in 1995 but not in 2005 (give-up exporters), do not export in 1995 but export in 2005 (starting exporters), and firm that export in both in 1995 and 2005 (always exporters). Figure 1 provides a visual representation of our partition of firms. In the case of imports we follow the same procedure ending up with a similar partition: exiters importers, entrants

[5]For payments made via non-resident banks and non-resident financial firms the Belgian resident involved in the operation must report the details of the operation directly to the NBB.

[6]The threshold at which a legal obligation to report the transaction arises is rather low and has fluctuated between 12,500 and 25,000 euros during the period 1995-2005. To ensure consistency over time, we impose on the raw data the same threshold of 25,000 euros.

[7]The latter group includes Belgian affiliates of a foreign group which do not exist as a separate legal entity in Belgium and fiscal representatives.

importers, never importers, etc.

Measuring occupational tasks and IT use changes. The third piece of the our dataset, the QCS, has been provided by the BIBB-IAB. The QCS is composed of five waves (1979, 1985/86, 1991/92, 1998/99 and 2006) and, since DiNardo and Pischke (1997) and Spitz-Oener (2006) seminal papers, the data has been extensively used by a number of scholars in different fields and in particular labour economics.[8] Given that our goal is to analyze the relationship between occupational tasks changes and the participation to service trade, we need to contemplate a sufficiently long time period for changes in occupational tasks and service trade participation to be sizable. For the purpose of our investigation, we focus on the 1991/92 and 2006 waves in order to roughly match the time coverage of our trade and balance sheet data.

In the QCS dataset every individual is classified by occupation (100 categories) and sector (42 entries). A major advantage of this dataset is that workers directly indicate whether or not they perform a given task. Such feature is particularly relevant in our analysis, where the time dimension is key, because it prevents underestimating the change in the occupational content. Indeed in the DOT (Dictionary of Occupational Titles), a similar US survey, field experts are called to assign frequency and/or importance scores to tasks used in different occupations. However, as highlighted by Spenner (1983), this process leads to an underestimation of the time changes in jobs content. Moreover, surveys like the DOT are typically not comparable across time. By contrast, QCS waves are highly comparable. As highlighted by Spitz-Oener (2006), the occupation and sector classifications, and in general the structure of the questionnaire, have only marginally changed over time.[9]

In order to derive our measures of tasks occupational change we follow Spitz-Oener (2006). We start by classifying the different tasks considering how repetitive is their nature and whether they imply manual, cognitive or interactive activities. We end up with five cate-

[8] See Dustmann et al. (2009), Gathmann and Schönberg (2010), and Becker et al. (2009) among others.

[9] In every wave a worker states which tasks he/she performs in his/her occupation. In the 2006 wave, workers are further allowed to state how often they perform a certain task (frequently, occasionally or never). We take this into account by considering that a task is performed only if a worker states that he/she performs it frequently.

gories: analytical tasks, interactive tasks, routine cognitive tasks, routine manual tasks and non-routine manual tasks. Table 3 provides a detailed list of the different tasks (analyzing, bookkeeping, serving, entertaining, etc.) associated to each of the five categories. Second, we define for every category j the individual-level task intensity as the ratio of the number of performed activities pertaining to category j to the total number of activities in category j by worker i in a particular wave t:

$$Task_{i,j,t} = \frac{number\ of\ activities\ in\ category\ j\ performed\ by\ i\ at\ time\ t}{total\ number\ of\ activities\ in\ category\ j\ at\ time\ t},$$

where $t = (1992, 2006)$ and

$$j = \left\{ \begin{array}{ll} 1 & : analytical\ tasks \\ 2 & : interactive\ tasks \\ 3 & : routine\ cognitive\ tasks \\ 4 & : routine\ manual\ tasks \\ 5 & : non-routine\ manual\ tasks. \end{array} \right\}$$

For instance, if the category interactive tasks contains six tasks and worker i indicates that he or she performs three of them, the interactive task measure for this worker will be 0.5. Third, we aggregate $Task_{i,j,t}$ averaging across workers within each of the 30 sectors (indexed by k) listed in Table 1, thus obtaining a sector k and wave t specific measure ($Task_{k,j,t}$) of the relative use of of task category j. Finally, we define the time change of $Task_{k,j,t}$ as $\Delta Task_{k,j} \equiv Task_{k,j,2006} - Task_{k,j,1992}$ and use it as our baseline measure of occupational task changes across industries. Table 4 shows the evolution across the different waves of the five task groups intensities $Task_{k,j,t}$ when pulling together all sectors. While extending the time coverage of the analysis in Spitz-Oener (2006), our results confirm the sharp increase in the use of non-routine cognitive tasks, both analytical and interactive, coupled with a steady decline in routine cognitive and manual tasks.

In our analysis we also consider the link between technological change and the participation to service trade. In order to measure technological change, we follow Autor et al. (2003) and Spitz-Oener (2006) and focus on the utilization of information technology. The QCS provides

us with a dummy variable taking value one if worker i uses computers, terminals and electronic data processing machines. In order to measure the change in the importance of IT, we start by building (for each sector k and wave t) the ratio of the number of workers using IT to the total number of workers. Analytically:

$$IT_{k,t} = \frac{number\ of\ workers\ in\ sector\ k\ using\ computers\ at\ time\ t}{total\ number\ of\ workers\ in\ sector\ k\ at\ time\ t}.$$

Second, we consider the change over time of $IT_{k,t}$ defined as $\Delta IT_k \equiv IT_{k,2006} - IT_{k,1992}$ and employ it as our measure of technological change. The last column of Table 4 reveals the dramatic increase in the use of IT (when pulling together all industries) over time, rising from a value of 6% in 1979 to 68% in 2006.

Focusing on the impact of technological change, as measure by the change in the use of IT, on the change in tasks both within and across occupations Autor et al. (2003), Levy and Murnane (1996), and Spitz-Oener (2006) show that the diffusion of IT displaces routine cognitive and manual tasks while complementing non-routine cognitive (interactive and analytical) tasks. Furthermore, Freund and Weinhold (2002) show using a cross-country data that the diffusion of internet is associated to the increase in the value of trade in services. By combining these findings, one might believe that technological change ΔIT_k should be the key variable to be compared with the rise in service trade participation among firms. However, for a number of reasons that will become clear afterwards, $\Delta Task_k$ is a much more informative measure. Anticipating our results, we will show later on that the relationship between service trade participation and occupational tasks has evolved in a manifold way that cannot be reduced to a unidimensional measure like ΔIT_k. In particular, the tension between the rise in interactive tasks and the need for some sort of proximity in the provision of services breaks the simple relationships one might conjecture about IT diffusion and rise in the number of service trading firms.

A possible issue with QCS data is that they refer to a country other than Belgium: Germany. In our view this should not be a big deal. First, there is a great affinity between Germany and Belgium. They are both part of the EU and OECD and are close in terms of

geographical location, economic development, income distribution, labor market institutions, social policy and culture with a significant proportion of the Belgian population speaking German. Second, it is difficult to imagine that the demand faced by service trading firms in the two countries is substantially different. Third, it is hard to believe that services' production and distribution technology differs remarkably across developed countries. For example, the technology used for reading and transmitting X-rays in Belgium and Germany is very much likely to be commonly dictated by world best practice rather than by countries idiosyncracies.

3 Facts About Trade in Services in Belgium

In the next Section we will analyze the relationship between occupational tasks change and the evolution of trade in services focusing on firms' participation (extensive margin). In this Section we document a number of facts about trade in services in Belgium that will guide us in the subsequent econometric analysis.

Building on the classification of firms represented in Figure 1 we decompose the aggregate increase in exports and imports of services from 1995 to 2005. Table 5 shows that aggregate trade values increased by more than 200% for both exports and imports with the the number of exporting (importing) firms rising by 108% (59%). Such remarkable increase in the total number of trading firms comes from two sources: (i) comparing entrants and exiters the number of entrants exporting firms in 2005 substantially exceeds the number of exiting exporting firms in 1995; (i) looking within stayers start exporting firms largely outnumber give-up exporters. As one can further notice, the same pattern emerges for service imports.

To gain further insights of the change occurred in service trade in Table 6 we distinguish firms that have their primary activity in the group of service sectors from those whose primary activity is in manufacturing. From a static perspective service sectors account for the lion's share of both aggregate trade values and number of firms. Companies with their main activity in service sectors represent, depending on the year and type of trade, in between 71% and 93% of the firms involved in service trade with similar figures applying to total traded values. In terms of dynamics, the rise in firms' participation to service trade is entirely driven by

service sectors. For example, while the number of manufacturing firms exporting services is virtually unchanged (from 563 to 562), the number of exporters belonging to service sectors more than doubles over 10 years going from 3,516 to a whopping 7,928. At the same time manufacturing sectors decreased their weight also in terms of aggregate trade values going from 15% in 1995 to 8% in 2005 for export and from 27% to 17% for imports.

What are the sectors mainly involved in service trade? Table 7 shows the top 10 trading sectors in terms of traded values, while Table 8 shows the top 10 sectors in terms of the number of firms involved in service trade. As one can see from both Tables, the leading role is played by sectors belonging to the services group with only few of the top ten sectors belonging to the manufacturing group. But have sectors experienced the same evolution in terms of trading firms and traded values? This is a rather important question for us because, as will become clear later on, our identification strategy relies on the existence of a sizeable cross-sectoral variation in the extensive margin. Table 9 shows that such variation is present in the data with the sector experiencing the largest increase in the number of trading firms, for both exports and imports, being *Professional, Scientific and Technical Activities*. On the other hand, Financial Services lead in terms of the increase in values for both exports and imports. Comparing absolute changes in Table 9 with the levels in 1995 from Tables 7 and 8 further reveals that variation across sectors also exists in relative terms.

Finally, Table 10 provides the list of the 10 top-trading countries in terms of traded values and number of firms, for both exports and imports of services. Possibly, the most striking feature emerging from Table 10 is the extreme stability of countries' rankings in terms of trading firms. For example, the top-10 destinations of Belgian service exports are the same in 1995 and 2005 with only the US, Luxembourg and Switzerland switching their positions. This pattern suggests that the country dimension has eventually played only a secondary role in the expansion of firms' participation to service trade.

4 Econometric Strategy

As outlined in Section 2, our key variables of interest are the task j intensity changes in industry k ($\Delta Task_{k,j}$) measuring the evolution over time in the use of the five task groups

(analytical, interactive, routine cognitive, routine manual, and non-routine manual) across industries. To bridge our results with previous findings on the impact of technological change on occupational tasks and service trade we will be using in some specifications ΔIT_k which captures the change over time in the use of IT (computers, terminals and electronic data processing machines).

In order to analyze the link between occupational tasks change and the increase in the number of firms trading services we must first take into account that we are not dealing with a homogeneous group of firms. As outlined above, in between 1995 and 2005 a considerable number of new trading firms has emerged while at the same time substantial entry and exit have occurred both in terms of trading participation and presence in the domestic market leading to the taxonomy depicted in Figure 1. In our investigation, we take these features into account by running different estimations for the various groups. In order to further account for heterogeneity across firms we consider, building upon the evidence provided on service traders by Breinlich and Criuscolo (2011), the following firm f-level controls: log value added per worker ($Prod_f$) that is our measure of productivity, log employment ($Size_f$) which is our measure of firm size, log tangible assets value over employment ($\frac{k}{l}_f$) in order to capture capital intensity, and log intangible assets value per worker ($\frac{ik}{l}_f$) that is our proxy for expenditure in technology. The availability of such controls will also allow us to check for possible heterogeneous effects of occupational tasks changes by means of interaction terms.

In what follows we describe the methodology used to analyze export participation with the one for imports being identical. Our dependent variable, Exp_f, is a dummy taking value one if firm f is exporting and zero otherwise. For entrants and exiters there are only two types of firms (exporters and non-exporters) so that we run a single regression for each of the two groups. In the case of stayers there are four groups (never exporters, give-up exporters, starting exporters, and always exporters) and we consider three estimations in which the reference category is always represented by never exporters. In all cases but entrants firm covariates refer to 1995. In all cases but entrants and starting exporters the export status refer to 1995. In the case of entrants (and starting exporters) covariates (and export status) refer to 2005.

Since our dependent variable is binary we use a Probit model and report marginal effects. Given that occupational tasks changes are measured at the industry level, they are identified by the cross-industry variation in $\Delta Task_{k,j}$. We thus cluster standard errors at the industry level. Moreover, as a control for initial conditions and patterns of comparative advantage across sectors we add to the specification the level of tasks intensities at the beginning of the period ($Task_{k,j,1992}$). Analytically we estimate the following equation:

$$Exp_f = Const + \alpha_j^1 \Delta Task_{k,j} + \alpha_j^2 Task_{k,j,1992} + \beta^1 Prod_f + \beta^2 Size_f + \beta^3 \frac{k}{l}_f + \beta^4 \frac{ik}{l}_f + \epsilon_f, \quad (1)$$

where $Const$ is a constant term and ϵ_f is an iid error component.

In some regressions we make use of a standard measure of technological change (the change in IT use) to shed light on its relationship with the rise in the extensive margin of service trade. We employ the same specification as in (1) but substitute tasks intensities with IT use change ΔIT_k.

5 Core Results

The key parameters in our analysis are the five α_j^1. Table 11 provides estimations of (1) for the five groups of firms we consider. The most striking feature of our results is that coefficients' sign and significance for each task j intensity change $\Delta Task_{k,j}$ are extremely consistent across firm groups. For example, the change in analytical tasks intensity has a positive and significant impact in all cases meaning that, in industries characterized by larger changes, firms have experienced a higher likelihood to: (i) become exporters among the stayers; (ii) quit exporting among the stayers; (iii) keep exporting among the stayers; (iv) being an exporter among the exiters; (v) being an exporter among entrants.

In other words, this means that the rise in analytical tasks is associated to a churning effect in service export participation with higher gross entry and exit and an overall net increase (as confirmed by the magnitude and signs across the different samples) in the number of trading firms. Considering stayers, coefficients are directly comparable among the three samples

because the reference category ($Exp_f = 0$) is the same (never exporters). This means that an increase of one unit in $\Delta Task_{k,analytical}$ corresponds to an increase in net entry of 0.0005 = 0.0008-0.0004+0.0001 probability points. Given that the probability of being a service exporter among stayers has changed from 0.0274 in 1995 to 0.0396 in 2005 and that the average (across stayers firms) value of $\Delta Task_{k,analytical}$ is 2.0580 we have that the observed change in analytical tasks intensity is associated to 8.2% of the net increase in the number of exporting firms among stayers: 2.0580 $\times$ 0.0005 / (0.0396-0.0274). Turning to entrants and exiters, coefficients can be made comparable by weighting for the number of observations pertaining to the two estimations. An increase of one unit in $\Delta Task_{k,analytical}$ is associated to (0.0014 $\times$ 63,794) - (0.0007 $\times$ 35,775) = 64 more exporters. Considering that the average value of $\Delta Task_{k,analytical}$ is 2.3033 (2.0721) for entrants (exiters) and that in the sample of firms for which we have data there are 2,510 exporting entrants and 1,046 exporting exiters, we have that the change in analytical tasks intensity corresponds to 10.5% of the net increase in the number of exporting firms among exiters and entrants: ((0.0014 $\times$ 63,794 $\times$ 2.3033) - (0.0007 $\times$ 35,775 $\times$ 2.0721))/(2,510-1,046).

The same churning effect applies across the board (except one not significant coefficient) for both interactive and routine cognitive tasks. In particular, by considering magnitudes and signs across the different samples, the demise (rise) in routine cognitive (interactive) tasks is associated to lower gross entry and exit and an overall net decrease in the number of trading firms. Out of these two task categories, interactive tasks (negotiating, selling, buying, advising customers, etc.) are particularly interesting when considering service trade. The negative effect of the change in interactive tasks on export participation echoes findings in Oldenski (2010). She finds that the more the production and/or provision of a particular service is intensive in direct communication with customers, the lower the probability of engaging in exports activities as opposed to FDI. Broadly speaking, both Oldenski (2010) and our findings underline the special role that proximity between demand and supply plays for services. In this respect, considering that $\Delta Task_{k,interactive}$ has increased over time, our results point (to the extent they have a causal interpretation) to the rise of interactive task having hampered firms' participation to services exports.

Our results should be taken with caution because, despite having a reasonable number of relevant controls, endogeneity might well be at work. Likely, simultaneity is not an issue in our analysis because occupational tasks changes are measured at a level of aggregation (industry) which is reasonably exogenous to a single firm while being at the same time coming from another country. On the other hand, there might be some omitted variables correlated with $\Delta Task_{k,j}$ that could be interfering with our estimations. While we cannot rule out such possibility we will show in the next Section that our results are robust to a number of alternative specifications accounting for patterns of comparative advantage, liberalization of service trade, and the impact of offshoring and shifts in consumers' demand on occupational tasks.

Before moving to the additional findings provided in next Section we point here to two further results. First, Table 12 shows estimations of (1) where we replace $\Delta Task_{k,j}$ with a measure of the increase in the use of IT over time: ΔIT_k. Indeed, an influential literature including among others Autor et al. (2003) and Spitz-Oener (2006) show that technological change (as measured by the change in IT use) has a been a key driving force in shaping the evolution, both across and within occupations, of tasks. In particular, technological change is a substitute for routine-cognitive and routine-manual tasks and a complement for non-routine analytical and interactive tasks. Indeed, this is perfectly in line with the figures we provide in Table 4 where in between 1992 and 2006 the increase in the use of IT goes hand in hand with the increase (decrease) in the intensity of analytical, interactive, and non-routine manual (routine cognitive and manual) tasks.

Our estimations indicate that the change in IT use does not translate into a significantly higher or lower firms' participation to service export. Though signs are consistently positive across samples, standard errors are such that significance is achieved only for entrants. Given previous results on tasks intensities this should come at no surprise. The negative (positive) impact of $Task_{k,interactive}$ ($Task_{k,analytical}$) we identify above do play in opposite directions with a strength determined by the magnitude of their correlation with ΔIT_k. The overall balance is such that technological change does not strike as being a key underlying factor behind the increase in the extensive margin of service exports. Such findings are somewhat

at odds with Freund and Weinhold (2002). Using country-level data, Freund and Weinhold (2002) show that the diffusion of the internet is associated to an increase in the value of trade in services. Besides differences in the type of data (micro vs macro), the outcome measure (extensive margin vs aggregate trade value), and the geographical scope (Belgium vs World) we believe that IT use and internet diffusion might not be necessarily capturing the same thing. In our data IT use is measured from the workers/firms side while the diffusion of internet in Freund and Weinhold (2002) likely refers to both commercial and private use. Therefore, one way of reconciling the two results is that computerization and the internet contribute to the rise of service trade from the consumers' side but not much from the firms' side.

Second, the recent trade literature spurred by, among others, Melitz (2003) seminal paper emphasizes the importance of firm heterogeneity and intra-industry reallocation patterns like those documented in Bernard et al. (2006) and Pavcnik (2002). Table 13 provides results of an augmented version of (1) where we consider interactions of $\Delta Task_{k,j}$ with our firm-level controls (productivity, size, tangible and intangible assets per worker). Besides a few exceptions, interaction coefficients are not significant and do not display any consistent pattern. These findings further qualify our results by suggesting that within-industry reallocations across firms did not play a significant role in the interplay between service trade participation and occupational tasks changes.

6 Additional Results

In this Section we provide a number of additional results that corroborate and further qualify our discoveries.

Patterns of comparative advantage? One possible issue with the interpretation of our results is that occupational tasks changes might be correlated with specialization patterns across industries driven by comparative advantage. Despite having used the initial levels of tasks intensities $Task_{k,j,1992}$ as controls, it might still be the case that, for example, Belgium has a comparative advantage (disadvantage) in industries characterized by a high intensity

in analytical (interactive) tasks due to fundamentals other than the tasks (natural resources, amenities, abundance of industry-specific factors, etc.). In a scenario of trade liberalization and/or decrease in trade costs, comparative advantage along these dimensions would induce Belgium to further specialize its service trade structure and firm export participation accordingly. These features might only be imperfectly captured by $Task_{k,j,1992}$ thus leading to some degree of spurious correlation with $\Delta Task_{k,j}$.

One way of getting a feeling about this problem is to check whether our results still apply to service imports participation. Indeed, if the same patterns are present in both exports and imports it is quite unlikely for comparative advantage to be driving them. Tables 14 and 15 provide a reassuring reply to these concerns. In particular, Table 14 shows that changes in analytical and routine cognitive tasks intensities follow the same behavior described in the case of export service participation. Though, the change in interactive tasks intensity does not. Table 15 indicates that the not significant α_j^1 of interactive tasks for service imports participation is driven by firms belonging to manufacturing. In fact, when restricting the analysis to firms with their main activity in service sectors, we find again a negative and significant sign for $\Delta Task_{k,interactive}$ across all samples. While corroborating our story, these findings point to occupational tasks changes having a clearer and stronger link with firms' trade participation within service sectors. This is confirmed by the larger magnitude of coefficients in Table 16 where, in modeling export participation, we restrict the sample to firms belonging to service sectors.

Service trade liberalization? Another concern one might reasonably raise in our analysis is that occupational tasks changes might be correlated with the process of service trade liberalization. If, for example, Belgium was disproportionately exporting analytical tasks intensive services to those countries with whom it has been liberalizing trade the most, one would find a positive coefficient for $\Delta Task_{k,analytical}$. However, as previously seen in Table 10, in between 1995 and 2005 the ranking of the top 10 destinations of Belgian service exports has barely changed. The lack of substantial variation in the country of destination dimension is in line with the arguments presented in Hoekman (2008) and Francois and Hoeckman (2010) such that GATS has had a negligible impact on service tradability. First, GATS

commitments of WTO members were frequently more restrictive than the actual implemented policies (Hoekman, 2008; Gootiiz and Mattoo, 2009). Second, most countries did not make any multilateral concession on the liberalization of service trade modes 2 and 4 that involve the movement of people (Hoekman et al., 2007) with a few liberalizations episodes occurring via bilateral agreements (Hoekman et al., 2007; Hoekman, 2008). Third, and most importantly, very little progress has been made so far in the implementation of concrete liberalization policies (Gootiiz and Mattoo, 2009; Hoekman, 2008; Francois and Hoeckman, 2010). The unique concrete signal in the direction of a liberalization in our time frame comes from the European Union. The EU has been actively promoting the tradability of services within the common market framework by means of some directives affecting different types of services and culminating in the 2004 directive on services in the Internal Market. In order to address the concern that what is driving our results is the process of sector-specific service trade liberalization by the EU, we estimate again (1) while narrowing the definition of service exports. More precisely, we consider only service exports outside the EU25 while assigning export status to firms accordingly. Table 17 allays these concerns by broadly confirming previous results.

Offshoring and tasks? A missing element in our analysis is offshoring. Using data on German multinationals, Becker et al. (2009) show that offshoring (defined as having affiliates abroad) has a statistically significant impact on the onshore workforce composition. In particular, offshoring is associated with a statistically significant shift towards more non-routine and more interactive tasks, and a shift towards highly educated workers. Considering that share of employment accounted by multinationals in Belgium is sizeable (16.4% in 1995 and 21.4% in 2005), the rise of offshoring has likely had a substantial impact on the evolution of tasks intensities. In order to investigate to what extent offshoring is driving our results we consider, as an additional control variable in (1), the sectoral change in the number of multinationals over the period 1995-2005.[10] This variable broadly accounts for the change in the quantitative importance of offshoring across sectors over the time frame we analyze.

[10]Information on the multinational status of firms comes from the yearly survey of Foreign Direct Investments carried out by the NBB. See Behrens et al. (2011) for further details.

Results reported in Table 18 suggest that offshoring is, contrary to the change in IT use, a key factor contributing to the rise of service trade. Though, the overall pattern and significance of tasks intensities changes are little affected hinting at other factors being at work.

Shift in consumers' demand and tasks? What are these other factors driving occupational tasks intensities changes other than IT use and offshoring? Among possible candidates are consumers' preferences. The IT revolution has not only changed the way people work but also the basket of goods and services they consume. Products like smart-phones, laptops, digital cameras, software nowadays account for a big chunk of consumers' expenditure. Consumers' preferences might thus have shifted over time towards goods and services whose production and distribution differ systematically in tasks intensities, so driving a re-allocation of resources across firms and sectors while at the same time pushing towards more service trade. To the extent that this process has equally affected goods and services (the iPhone being an example of a popular bundle of goods and services), we should find the same pattern identified above when analyzing the link between the extensive margin of goods trade and occupational tasks intensities changes. Table 19 indicates that this is not the case. The participation of firms to service and goods trade is associated to somewhat different occupational tasks intensities trajectories with, for example, the rise of interactive tasks being positively associated to the change in the extensive margin of goods exports.[11]

7 Conclusions

Using micro data for Belgium, we analyze the relationship between the the remarkable increase in the number of service trading firms in the last decade and changes in the task content of occupations. Our estimations uncover a rich pattern linking these two phenomena. The most striking feature of our results is that occupational tasks changes display an extremely consistent relationship with participation to service trade across firm groups pointing to strong churning effects. The change in analytical (interactive and routine cognitive) tasks intensity

[11]Micro data on goods trade are provided by the NBB and come from Intrastat (intra-EU trade) and Extrastat (extra-EU trade) declarations. See Behrens et al. (2011) for further details.

has a positive (negative) impact across the board meaning that, in industries characterized by larger changes, firms have experienced both higher (lower) entry and exit.

The negative effect of the change in interactive tasks on service exports participation echoes findings in Oldenski (2010). She finds that the more the production and/or provision of a particular service is intensive in direct communication with customers, the lower the probability of engaging in exports activities as opposed to FDI. Broadly speaking, both Oldenski (2010) and our findings underline the special role that proximity between demand and supply plays for services. In this respect, considering that interactive tasks intensity has increased over time, our results point (to the extent they have a causal interpretation) to the rise of interactive task having hampered firms' participation to services exports. Interestingly, we find exactly the opposite result (a positive relationship) between the evolution of the extensive margin of goods exports and the change in interactive tasks intensity.

Our results should be taken with caution because, despite having a reasonable number of relevant controls, endogeneity might well be at work. While we cannot rule out such possibility we show that our results are robust to a number of alternative specifications accounting for patterns of comparative advantage, liberalization of service trade, and the impact of offshoring and shifts in consumers' demand on occupational tasks.

Some studies consider occupational tasks changes as an outcome variable. Autor et al. (2003) and Spitz-Oener (2006) show that technological change (as measured by the change in IT use) has a been a key driving force in shaping the evolution, both across and within occupations, of tasks. In particular, technological change is a substitute for routine-cognitive and routine-manual tasks and a complement for non-routine analytical and interactive tasks. On the other hand, Becker et al. (2009) show that offshoring (defined as having affiliates abroad) has a statistically significant impact on the onshore workforce composition. In particular, offshoring is associated with a statistically significant shift towards more non-routine and more interactive tasks, and a shift towards highly educated workers.

Our estimations indicate that the change in IT use does not translate into a significantly higher or lower firms' participation to service export. Indeed, the negative (positive) impact of interactive and routine cognitive (analytical) tasks changes do play in opposite directions.

The overall balance is such that technological change does not strike as being a key underlying force behind the increase in the extensive margin of service exports. On the other hand, our estimations suggest that offshoring is a key factor contributing to the rise of service trade. Though, the overall pattern and significance of tasks intensities changes are little affected hinting at other factors being at work.

What are these other factors driving occupational tasks intensities changes other than IT use and offshoring? By comparing the evolution of the extensive margin between goods and service trade we show that a shift in consumers' preferences towards goods and services whose production and distribution differ systematically in tasks intensities is not a straightforward answer. We look forward to future research in this direction.

References

Autor, D. and Acemoglu, D. (2011). Skills, Tasks and Technologies: Implications for Employment and Earnings. In Ashenfelter, O. and Card, D. E., editors, *Handbook of Labor Economics Vol. 4B*, volume 124, pages 1043–1171. Elsevier, Amsterdam.

Autor, D., Levy, F., and Murnane, R. J. (2003). The Skill Content of Recent Technological Change: an Empirical Exploration. *Quarterly Journal of Economics*, 118(4):1279–1333.

Baldwin, R. and Robert-Nicoud, F. (2010). Trade-in-Goods and Trade-in-Tasks: An Integrating Framework. *NBER Working Papers*, 15882.

Becker, S. O., Ekholm, K., and Muendler, M.-A. (2009). Offshoring and the Onshore Composition of Tasks and Skills. *CEPR Discussion Paper*, 7391.

Behrens, K., Corcos, G., and Mion, G. (2011). Trade Crisis? What Trade Crisis? *Review of Economics and Statistics*, forthcoming.

Bernard, A., Jensen, J., Redding, S., and Schott, P. (2011). The Empirics of Firm Heterogeneneity and International Trade. *Annual Review of Economics*, forthcoming.

Bernard, A., Jensen, J., and Schott, P. (2006). Survival of the Best Fit: Exposure to Low-Wage Countries and the (Uneven) Growth of US Manufacturing Plants. *Journal of International Economics*, 68(1):219–237.

Blinder, A. S. (2006). Offshoring: the Next Industrial Revolution? *Foreign Affairs*, 85(2):113–128.

Blinder, A. S. (2009). How Many U.S. Jobs Might Be Offshorable? *The World Economics*, 10(2):41–78.

Breinlich, H. and Criuscolo, C. (2011). International Trade in Services: a Portrait of Importers and Exporters. *Journal of International Economics*, 84(2):188–206.

DiNardo, J. E. and Pischke, J.-S. (1997). Service The Returns to Computer Use Revisited: Have Pencils Changed the Wage Structure Too? *The Quarterly Journal of Economics*, 112(1):291–303.

Dustmann, C., Ludsteck, J., and Schönberg, U. (2009). Revisiting the German Wage Structure. *Quarterly Journal of Economics*, 124(2):843–881.

Federico, S. and Tosti, E. (2010). Exporters and importers of services: Firm-level evidence on italy. *mimeograph*.

Francois, J. J. and Hoeckman, B. (2010). Services Trade and Policy. *Journal of Economic Literature*, 48(3):642–692.

Freund, C. and Weinhold, D. (2002). The Internet and International Trade in Services. *American Economic Review*, 92(2):236–240.

Gathmann, C. and Schönberg, U. (2010). How General Is Human Capital? A Task-Based Approach. *Journal of Labor Economics*, 28(1):1–49.

Gaulier, G., Mirza, D., and Milet, E. (2010). French Firms in International Trade in Services. *mimeograph*.

Gootiiz, B. and Mattoo, A. (2009). Services in Doha : What's on the Table? *Policy Research Working Paper Series*, (4903).

Grossman, G. M. and Rossi-Hansberg, E. (2008). Trading Tasks: A Simple Theory of Offshoring. *American Economic Review*, 98(5):1978–1997.

Hoekman, B. (2008). The General Agreement on Trade in Services: Doomed to Fail? Does it Matter? *Journal of Industry, Competition and Trade*, 8(3-4):295–318.

Hoekman, B., Mattoo, A., and Sapir, A. (2007). The Political Economy of Services Trade Liberalization: A Case for International Regulatory Cooperation? *CEPR Working Papers*, (6457).

Kelle, M. and Kleinert, J. (2010). German firms in service trade. *Applied Economics Quarterly (formerly: Konjunkturpolitik), Duncker & Humblot, Berlin*, 56(1):51–72.

Levy, F. and Murnane, R. J. (1996). With What Skills Are Computers a Complement? *American Economic Review*, 86(2):258–262.

Melitz, M. (2003). The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica*, 71(6):1695–1725.

Oldenski, L. (2010). Export Versus FDI: A Task-Based Framework for Comparing Manufacturing and Services. *mimeograph*.

Pavcnik, N. (2002). Trade Liberalization, Exit, and Productivity Improvements: Evidence from Chilean Plants. *Review of Economic Studies*, 69(1):245–276.

Spenner, K. (1983). Deciphering Prometheus: Temporal Change in the Skill Level of Work. *American Sociological Review*, 48(6):824–837.

Spitz-Oener, A. (2006). Technical Change, Job Tasks, and Rising Educational Demands: Looking Outside the Wage Structure. *Journal of Labor Economics*, 24(2):235–270.

Walter, P. and Dell'mour, R. (2010). Firm-Level Analysis of International Trade in Services. *IFC Working Papers No.4*.

World Trade Organisation (2008). *Statistics Database, International Trade and Tariffs Database*. available at www.wto.org.

Figure 1: Firms' Survival and Trade Status

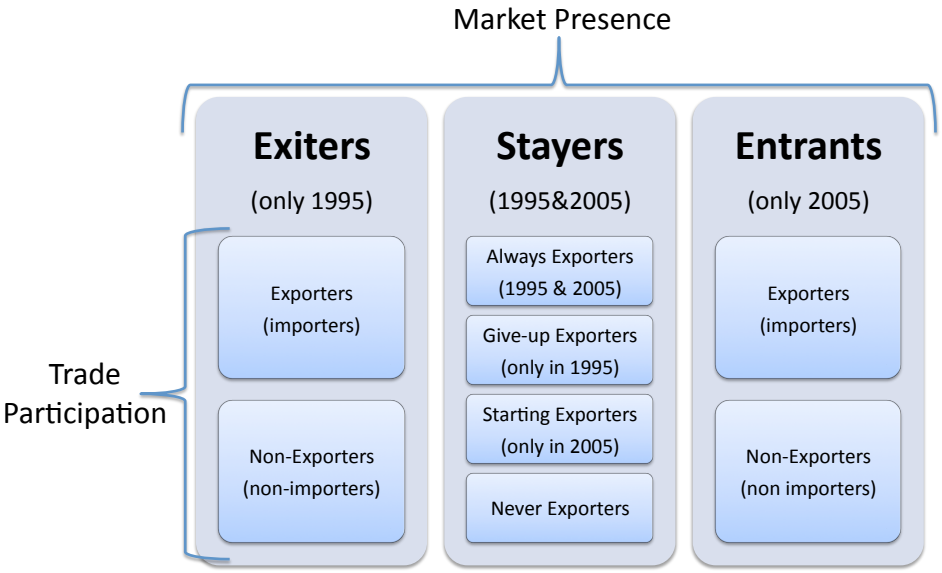

Table 1: Sectoral breakdown used

Sector
Food Beverages and Tobacco
Textile Industry
Leather and Leather Products
Wood and Wood Products
Cellulose and Paper Industry
Publishing, Printing and Reproduction
Chemical Industry, Rubber and Synthetic Materials
Stone and Clay, Glass and Ceramics
Manufacture of Basic Metals
Manufacture of Fabricated Metal Products
Precision and Optical Instruments
Electrical Engineering
Machinery Construction
Car Industry
Shipbuilding, Aircraft, and Aerospace
Office and Data-Processing Machines
Other manufacturing
Distribution of Energy, Water, Gas and Electricity
Construction Services
Wholesale and Retail Trade
Transport Services
Postal Services
Hotels and Restaurants
Information, Art and Communication Services
Financial Services
Insurance, Reinsurance and Pension Funding
Professional, Scientific and Technical Activities
Health and Veterinary
Schooling, Education
Other services

Table 2: Summary statistics of variables coming from balance sheet data

Variable	**Obs.**	**Mean**	**Std.Dev.**	5^{th} **Perc.**	95^{th} **Perc.**
		1995			
Employment	133,410	12.948	218.736	0.622	41,891
Value added	133,410	0.698	13.520	-6.509	2,235.199
Tangible capital	133,410	0.608	24.410	0.000	3,840.975
Intangible capital	133,410	0.050	2.630	0.000	401.104
Average firm wage	133,410	0.448	8.700	2.08e-06	1,460.360
		2005			
Employment	130,280	13.444	193.342	0.100	34,565.700
Value added	130,280	1.060	16.705	-53.869	1,873.134
Tangible capital	130.280	0.877	19.257	1.00e-06	2,050.569
Intangible capital	130,280	0.111	8.379	0.000	1,198.691
Average firm wage	130,280	0.633	9.741	1.00e-06	1,416.259

Note: values for value added, wages, tangible and intangible capital are in million euros, employment is in full time equivalent.

Table 3: Classification of tasks

Classification	**Task**
Analytical	researching, analyzing, evaluating and planning, making plans, constructions, designing, sketching, working out rules/prescriptions, using and interpreting rules
Interactive	negotiating, lobbying, coordinating, organizing, teaching or training, selling, buying, advising customers, advertising, entertaining or presenting, employ or manage personnel
Routine Cognitive	calculating, bookkeeping, correcting of texts/data, measuring of length/weight/temperature
Routine Manual	operating or controlling machines, equip machines
Non-Routine Manual	repairing or renovating houses, apartments and machines, restoring of art/monuments, serving or accommodating

Table 4: Evolution of tasks and IT intensity over time

	Non Routine Tasks			**Routine Tasks**		**IT use**
	Analytic	Interactive	Manual	Cognitive	Manual	
1979	0.04	0.09	0.14	0.36	0.31	0.06
1986	0.09	0.10	0.21	0.34	0.27	0.12
1992	0.11	0.17	0.20	0.27	0.23	0.28
1999	0.12	0.31	0.28	0.20	0.17	0.53
2006	0.13	0.32	0.23	0.16	0.23	0.68

Table 5: Decomposing the increase: aggregate values and number of firms

		Exports				Imports			
		Aggregate		# of Firms		Aggregate		# of Firms	
		1995	2005	1995	2005	1995	2005	1995	2005
Entrants	**Non Exp**	-	0	-	(151,950)	-	0	-	(153,741)
	Exp	-	10,707	-	4,114	-	9,419	-	2,323
Stayers	**Non Exp**	0	0	(116,625)		0	0	(117,452)	
	Give-up Exp	834	0	1,574	(1,574)	920	0	1,428	(1,428)
	Start Exp	0	2,358	(3,105)	3,105	0	3,474	(2,739)	2,739
	Always Exp	4,091	10,548	1,271	1,271	4,253	8,938	1,316	1,316
Exiters	**Non Exp**	0	-	(54,281)	-	0	-	(54,476)	-
	Exp	1,930	-	1,234	-	2,021	-	1,039	-
TOTAL		6,857	23,614	4,079	8,490	7,195	21,831	3,783	6,018
% GROWTH		244%		108%		203%		59%	

Note: values are in million of Euros. The numbers inside parentheses indicate the number of firms in that category. They are not used for computing the total and the % growth.

Table 6: Trading values and number of trading firms per sector

Aggregate Trade Values

	Exports				Imports			
	1995	**Perc.**	**2005**	**Perc.**	**1995**	**Perc.**	**2005**	**Perc.**
Manufacturing	878	15%	1,837	8%	2,004	27%	3,776	17%
Services	5,978	85%	21,776	92%	5,190	73%	18,055	83%
Total	6,856		23,613		7,195		21,831	

Number of Firms

	Exports				Imports			
	1995	**Perc.**	**2005**	**Perc.**	**1995**	**Perc.**	**2005**	**Perc.**
Manufacturing	563	14%	562	7%	1,083	29%	1,143	19%
Services	3,516	86%	7,928	93%	2,700	71%	4,875	81%
Total	4,079		8,490		3,783		6,018	

Note: aggregate trade values are in million of Euros.

Table 7: Top 10 trading sectors (values traded)

Export

Rank	Sector	1995	%	Sector	2005	%
1	Transport Services	2,542	37%	Financial Services	5,263	22%
2	Professional, Scientific and Technical Activities	1,334	19%	Professional, Scientific and Technical Activities	4,901	21%
3	Wholesale and Retail Trade	653	10%	Transport Services	4806	20%
4	*Chemical Industry, Rubber and Synthetic Material*	587	9%	Insurance, Reinsurance and Pension Funding	1,638	7%
5	Financial Services	424	6%	Information, Art and Communication Services	1,487	6%
6	Information, Art and Communication Services	369	5%	Wholesale and Retail Trade	1,420	6%
7	Construction	224	3%	*Chemical Industry, Rubber and Synthetic Material*	1,030	4%
8	Postal Services	152	2%	Construction Services	785	3%
9	Other services	116	2%	Other Services	784	3%
10	*Manufacture of Fabricated Metal Products*	65	1%	Postal Services	289	1%

Import

Rank	Sector	1995	%	Sector	2005	%
1	Transport Services	1,576	22%	Financial Services	4,275	20%
2	Wholesale and Retail Trade	1,183	16%	Professional, Scientific and Technical Activities	3,886	18%
3	*Chemical Industry, Rubber and Synthetic Material*	1,031	14%	Transport Services	3,343	15%
4	Professional, Scientific and Technical Activities	978	14%	*Chemical Industry, Rubber and Synthetic Material*	2,513	12%
5	Financial Services	821	11%	Insurance, Reinsurance and Pension Funding	2,418	11%
6	Other Services	193	3%	Wholesale and Retail Trade	2034	9%
7	Information, Art and Communication Services	161	2%	Information, Art and Communication Services	859	4%
8	*Car industry*	161	2%	Other services	615	3%
9	*Manufacture of Basic Metals*	150	2%	Construction Services	271	1%
10	*Machinery Construction*	150	2%	*Manufacture of Fabricated Metal Products*	221	1%

Note: values are in million of Euros. Sectors belonging to Manufacturing are in italics.

Table 8: Top 10 trading sectors (number of firms)

Export

Rank	Sector	1995	%	Sector	2005	%
1	Wholesale and Retail Trade	1,024	25%	Professional, Scientific and Technical Activities	3,213	38%
2	Professional, Scientific and Technical Activities	950	23%	Wholesale and Retail Trade	1,291	15%
3	Transport Services	667	16%	Information, Art and Communication Services	991	12%
4	Construction Services	276	7%	Transport Services	664	8%
5	Information, Art and Communication Services	214	5%	Construction Services	623	7%
6	Other Services	177	4%	Financial Services	545	6%
7	*Chemical Industry, Rubber and Synthetic Material*	99	2%	Hotels and restaurants	179	2%
8	*Manufacture of Fabricated Metal Products*	90	2%	Insurance, Reinsurance and Pension Funding	160	2%
9	*Publishing, Printing and Reproduction*	72	2%	*Manufacture of Fabricated Metal Products*	115	1%
10	Hotel and Restaurants	69	2%	Health and Veterinary	99	1%

Import

Rank	Sector	1995	%	Sector	2005	%
1	Wholesale and Retail Trade	1,170	31%	Professional, Scientific and Technical Activities	1,558	26%
2	Professional, Scientific and Technical Activities	615	16%	Wholesale and retail trade	1,473	24%
3	Transport Services	333	9%	Transport Services	483	8%
4	*Chemical Industry, Rubber and Synthetic Material*	223	6%	Information, Art and Communication Services	363	6%
5	Information, Art and Communication Services	150	4%	Other Services	328	5%
6	Construction Services	145	4%	Construction Services	289	5%
7	*Food Beverages and Tobacco*	137	4%	*Chemical Industry, Rubber and Synthetic Material*	246	4%
8	Other Services	134	4%	*Manufacture of Fabricated Metal Products*	146	2%
9	*Textile Industry*	112	3%	*Food Beverages and Tobacco*	141	2%
10	*Manufacture of Fabricated Metal Products*	103	3%	Financial Services	107	2%

Note: sectors belonging to Manufacturing are in italics.

Table 9: Sector change in the number of trading firms and values traded

Export

Rank	Sector	Δ # of firms	Sector	Δ values
1	Professional, Scientific and Technical Activities	2,263	Financial Services	4,839
2	Information, Art and Communication Services	450	Professional, Scientific and Technical Activities	3,567
3	Other Services	368	Wholesale and Retail Trade	2,265
4	Construction Services	347	*Chemical Industry, Rubber and Synthetic Material*	1,578
5	Transport Services	324	Financial Services	1,119
6	Wholesale and Retail Trade	267	Information, Art and Communication Services	768
7	Hotel and Restaurants	110	Construction Services	669
8	Insurance, Reinsurance and Pension Funding	101	Postal Services	562
9	Health and Veterinary	87	Other Services	444
10	Financial Services	57	Insurance, Reinsurance and Pension Funding	211

Import

Rank	Sector	Δ # of firms	Sector	Δ values
1	Professional, Scientific and Technical Activities	943	Financial Services	3,453
2	Wholesale and retail trade	303	Professional, Scientific and Technical Activities	2907
3	Information, Art and Communication Services	213	Insurance, Reinsurance and Pension Funding	2,364
4	Other Services	194	Transport Services	1,766
5	Transport Services	150	*Chemical Industry, Rubber and Synthetic Material*	1,482
6	Construction Services	144	Wholesale and Retail Trade	851
7	Financial Services	67	Information, Art and Communication Services	698
8	Hotels and Restaurants	52	Other Services	421
9	*Manufacture of Fabricated Metal Products*	43	Construction Services	181
10	Health and Veterinary	43	*Manufacture of Fabricated Metal Products*	180

Note: sectors belonging to Manufacturing are in italics. Values for aggregate changes are in millions of Euros

Table 10: Top 10 trading partners

Aggregate Trade Values

	Exports				Imports				
Rank	**Country**	**1995**	**Country**	**2005**	**Rank**	**Country**	**1995**	**Country**	**2005**
1	Germany	1,160	UK	4,729	1	USA	1,288	UK	4,719
2	USA	1,128	USA	4,152	2	UK	1,188	France	3,079
3	France	945	Netherlands	3,234	3	France	973	Germany	2,687
4	Netherlands	917	France	2,739	4	Germany	943	USA	2,363
5	UK	876	Germany	2,145	5	Netherlands	834	Netherlands	2,112
6	Switzerland	308	Luxembourg	1,269	6	Switzerland	337	Italy	922
7	Luxembourg	254	Switzerland	716	7	Luxembourg	209	Spain	761
8	Italy	196	Spain	695	8	Italy	178	Switzerland	708
9	Spain	133	Ireland	476	9	Japan	124	Luxembourg	660
10	Japan	117	Sweden	430	10	Austria	107	Hong Kong	367

Number of Firms

	Exports				Imports				
Rank	**Country**	**1995**	**Country**	**2005**	**Rank**	**Country**	**1995**	**Country**	**2005**
1	Netherlands	1,678	Netherlands	4,144	1	Netherlands	1,669	Netherlands	3,067
2	France	1,620	France	3,655	2	France	1,503	France	2,924
3	Germany	1,335	Germany	2,733	3	Germany	1,292	Germany	2,435
4	UK	1,083	UK	2,569	4	UK	1,122	UK	2,254
5	USA	1,011	Luxembourg	1,546	5	USA	1,039	USA	1,367
6	Switzerland	616	USA	1,489	6	Switzerland	673	Luxembourg	1,189
7	Luxembourg	499	Switzerland	1,184	7	Italy	487	Switzerland	1,125
8	Italy	479	Italy	1,097	8	Luxembourg	425	Italy	1,047
9	Spain	344	Spain	959	9	Spain	364	Spain	917
10	Sweden	258	Sweden	580	10	Sweden	250	Sweden	511

Note: aggregate trade values are in millions of Euros.

Table 11: Exports of Services and Tasks' Change

	(1)	(2)	(3)	(4)	(5)
Dep.Var=1 if Exp>0	Start	Give-up	Always	Exiters	Entrants
Prob y=1	0.0165	0.0043	7.501e-04	0.0073	0.0137
Change in Tasks:					
Δ Analytical	0.0008^b	0.0004^a	0.0001^c	0.0007^a	0.0014^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Interactive	-0.0023^a	-0.0004^b	-0.0002^b	-0.0010^a	-0.0019^a
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Δ Non-Rout. Manual	-0.0007	-0.0004^b	-0.0000	-0.0003	-0.0012^b
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Δ Routine Cognitive	0.0004	0.0003^a	0.0001^c	0.0003^b	0.0006^b
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Routine Manual	-0.0001	0.0000	-0.0000	-0.0003^c	0.0002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Firm-level controls:					
Productivity	0.0078^a	0.0074^a	0.0018^a	0.0110^a	0.0157^a
	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Size	0.0122^a	0.0048^a	0.0015^a	0.0084^a	0.0124^a
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Capital Intensity	0.0004	-0.0006^b	-0.0002^c	-0.0005^b	-0.0017^a
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Intangible Cap. Int.	-0.0001	-0.0000	-0.0000	0.0000	0.0002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Indutry-level controls:					
Analytical_{1995}	0.0014^b	0.0001	0.0001^c	-0.0000	-0.0018^a
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
$\text{Interactive}_{1995}$	-0.0019^a	0.0000	-0.0001^c	-0.0003	0.0014^b
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
$\text{Non-Rout. Manual}_{1995}$	-0.0002	-0.0002^b	0.0000	-0.0002^c	-0.0007^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\text{Routine Cognitive}_{1995}$	-0.0001	0.0003^a	0.0000^c	0.0002	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\text{Routine Manual}_{1995}$	-0.0013^a	-0.0002^a	-0.0001^a	-0.0004^a	-0.0013^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	95,723	94,508	94,318	35,775	63,794
Pseudo R^2	0.1329	0.2291	0.4300	0.2752	0.2479

Note: Industry-clustered standard errors in parentheses, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1. The table reports marginal effects of a Probit model in which the dependent variable takes value one if the firm is exporting and zero if not. This is done for all five categories of firms: Stayers that start exporting in 2005 (Start), that give-up exporting after 1995 (Give-up), Firms that always export (Always), Exiters and Entrants.

Table 12: Exports of Services and Computer Use

	(1)	(2)	(3)	(4)	(5)
Dep.Var=1 if Exp>0	Start	Give-up	Always	Exiters	Entrants
Prob y=1	0.0205	0.0052	0.0017	0.0096	0.0177
Change in Computer Use:					
Δ Computer	0.0359	0.0085	0.0012	0.0080	0.0741^{a}
	(0.043)	(0.008)	(0.009)	(0.021)	(0.026)
Indutry-level control:					
Computer_{1995}	0.0360^{c}	0.0137^{b}	0.0072^{c}	0.0276^{b}	0.0581^{b}
	(0.022)	(0.006)	(0.004)	(0.012)	(0.027)
Firm-level Controls	Yes	Yes	Yes	Yes	Yes
Observations	95,723	94,508	94,318	35,775	63,794
Pseudo R^2	0.0815	0.2033	0.3433	0.2382	0.1971

Note: Industry-clustered standard errors in parentheses, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1. The table reports marginal effects of a Probit model in which the dependent variable takes value one if the firm is exporting and zero if not. This is done for all five categories of firms: Stayers that start exporting in 2005 (Start), that give-up exporting after 1995 (Give-up), Firms that always export (Always), Exiters and Entrants. The estimated coefficients for the firm-level controls are available upon request.

Table 13: Interactions

	(1)	(2)	(3)	(4)	(5)
Dep.Var=1 if Exp>0	Start	Give-up	Always	Exiters	Entrants
Prob y=1	0.01631	0.0041	7.811e-04	0.0076	0.01372
Productivity * task change:					
Prod. * Δ Analytical	-0.0004[a]	-0.0001	0.0000	-0.0000	-0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Prod. * Δ Interactive	0.0002	0.0002[a]	0.0000	0.0001	-0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Prod. * Δ Non Rout. Man.	-0.0000	0.0001	-0.0000	0.0004[b]	0.0004[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Prod. * Δ Rout. Cognitive	-0.0001[b]	0.0000	0.0000	0.0000	0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Prod. * Δ Routine Manual	0.0001	0.0000	0.0000	-0.0000	-0.0002[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size * task change:					
Size * Δ Analytical	0.0002	0.0001	0.0000	0.0002[c]	0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size * Δ Interactive	-0.0004	-0.0001	-0.0000	-0.0003[b]	-0.0002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size * Δ Non Rout. Man.	-0.0004	-0.0000	-0.0000	-0.0001	-0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size * Δ Rout. Cognitive	-0.0000	0.0000	0.0000	-0.0000	0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size * Δ Routine Manual	0.0002	0.0000	0.0000	-0.0000	0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Capital Intensity * task change:					
K/L * Δ Analytical	0.0000	-0.0000	-0.0000	-0.0000	0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
K/L * Δ Interactive	0.0002[b]	-0.0000	0.0000	0.0000	-0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
K/L * Δ Non Rout. Man.	-0.0002[c]	-0.0000	0.0000	-0.0001[a]	-0.0003[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
K/L * Δ Rout. Cognitive	0.0001[a]	0.0000	0.0000	-0.0000	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
K/L * Δ Routine Manual	0.0000	0.0000	0.0000	0.0000[b]	0.0002[c]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Intangible Capital Intensity * task change:					
IK/L * Δ Analytical	0.0001[a]	-0.0000	0.0000[c]	0.0000[b]	0.0000[c]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IK/L * Δ Interactive	0.0000	0.0000	0.0000	0.0000	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IK/L * Δ Non Rout. Man.	0.0000	0.0000	0.0000	0.0000[c]	0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IK/L * Δ Rout. Cognitive	0.0000[b]	0.0000	0.0000	0.0000	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IK/L * Δ Routine Manual	-0.0000	-0.0000	-0.0000[b]	-0.0000	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Task Change Variables	Yes	Yes	Yes	Yes	Yes
Firm-level Controls	Yes	Yes	Yes	Yes	Yes
Industry-level Controls	Yes	Yes	Yes	Yes	Yes
Observations	95,723	94,508	94,318	35,775	63,794
Pseudo R^2	0.1393	0.2330	0.4354	0.2802	0.2510

Note: Industry-clustered standard errors in parentheses, [a] p<0.01, [b] p<0.05, [c] p<0.1. The table reports marginal effects of a Probit model in which the dependent variable takes value one if the firm is exporting and zero if not. This is done for all five categories of firms: Stayers that start exporting in 2005 (Start), that give-up exporting after 1995 (Give-up), Firms that always export (Always), Exiters and Entrants. The estimated coefficients for task change variables, the firm-level and industry controls are available upon request.

Table 14: Imports of Services and Tasks' Change

	(1)	(2)	(3)	(4)	(5)
Dep.Var=1 if Imp>0	Start	Give-up	Always	Exiters	Entrants
Prob y=1	0.0097	0.0023	2.376e-04	0.0035	0.0047
Change in Tasks:					
Δ Analytical	0.0007[a]	0.0003[a]	0.0000[a]	0.0004[a]	0.0006[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Interactive	-0.0002	0.0001	0.0000	-0.0000	-0.0003
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Non Rout. Man.	-0.0006[b]	-0.0002[a]	-0.0000[a]	-0.0003[b]	-0.0004
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Rout. Cognitive	0.0007[a]	0.0003[a]	0.0000[a]	0.0004[a]	0.0003
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Rout. Manual	0.0002	0.0000	0.0000	-0.0000	0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Firm-level Controls	Yes	Yes	Yes	Yes	Yes
Industry-level Controls	Yes	Yes	Yes	Yes	Yes
Observations	95,791	95,042	95,018	35,775	63,794
Pseudo R^2	0.1827	0.2928	0.5167	0.3286	0.3140

Note: Industry-clustered standard errors in parentheses, [a] p<0.01, [b] p<0.05, [c] p<0.1. The table reports marginal effects of a Probit model in which the dependent variable takes value one if the firm is importing and zero if not. This is done for all five categories of firms: Stayers that start exporting in 2005 (Start), that give-up exporting after 1995 (Give-up), Firms that always export (Always), Exiters and Entrants. The estimated coefficients for firm-level and industry controls are available upon request.

Table 15: Imports, only firms belonging to the services sector

	(1)	(2)	(3)	(4)	(5)
Dep.Var=1 if Imp>0	Start	Give-up	Always	Exiters	Entrants
Prob y=1	0.0090	0.0020	2.777e-04	0.0033	0.0047
Change in Tasks:					
Δ Analytical	0.0004	0.0007[a]	0.0001[a]	0.0009[a]	0.0006[a]
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Interactive	-0.0017[a]	-0.0006[b]	-0.0001[b]	-0.0011[a]	-0.0003[a]
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Non-Routine Manual	-0.0001	-0.0003	-0.0000	0.0002	-0.0004[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Routine Cogntive	-0.0003	-0.0000	-0.0000	-0.0004[c]	0.0003[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Routine Manual	0.0001	-0.0001	-0.0000[c]	-0.0007[b]	0.0000
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Firm-level Controls	Yes	Yes	Yes	Yes	Yes
Industry-level Controls	Yes	Yes	Yes	Yes	Yes
Observations	83,181	82,480	82,419	31,138	63,794
Pseudo R^2	0.1766	0.2590	0.4727	0.3114	0.3140

Note: Industry-clustered standard errors in parentheses, [a] p<0.01, [b] p<0.05, [c] p<0.1. The table reports marginal effects of a Probit model in which the dependent variable takes value one if the firm is importing and zero if not. This is done for all five categories of firms: Stayers that start exporting in 2005 (Start), that give-up exporting after 1995 (Give-up), Firms that always export (Always), Exiters and Entrants. The estimated coefficients for firm-level and industry controls are available upon request.

Table 16: Exports, only firms belonging to the services sector

	(1)	(2)	(3)	(4)	(5)
Dep.Var=1 if Exp>0	Start	Give-up	Always	Exiters	Entrants
Prob y=1	0.0166	0.0038	7.539e-04	0.0070	0.0141
Change in Tasks:					
Δ Analytical	0.0039^a	0.0013^a	0.0004^a	0.0023^a	0.0043^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Δ Interactive	-0.0049^a	-0.0010^a	-0.0005^a	-0.0026^a	-0.0043^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Δ Non Rout. Man.	-0.0011^a	-0.0007^a	-0.0000	-0.0006^a	-0.0011^b
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Δ Rout. Cognitive	-0.0007^b	0.0001	-0.0001^c	-0.0004^b	-0.0006
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Rout. Manual	-0.0018^a	-0.0002	-0.0003^a	-0.0009^a	-0.0015^a
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Firm-level Controls	Yes	Yes	Yes	Yes	Yes
Industry-level Controls	Yes	Yes	Yes	Yes	Yes
Observations	82,699	81,457	81,442	31,138	58,714
Pseudo R^2	0.1433	0.2216	0.4402	0.2860	0.2531

Note: Industry-clustered standard errors in parentheses, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1. The table reports marginal effects of a Probit model in which the dependent variable takes value one if the firm is exporting and zero if not. This is done for all five categories of firms: Stayers that start exporting in 2005 (Start), that give-up exporting after 1995 (Give-up), Firms that always export (Always), Exiters and Entrants. The estimated coefficients for firm-level and industry controls are available upon request.

Table 17: Non-EU Exports

	(1)	(2)	(3)	(4)	(5)
Dep.Var=1 if Exp>0	Start	Give-up	Always	Exiters	Entrants
Prob y=1	0.0034	0.0011	1.172e-04	0.0011	0.0019
Change in Tasks:					
Δ Analytical	0.0002^b	0.0001^a	0.0000^c	0.0002^a	0.0002^b
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Interactive	-0.0004^a	-0.0001	-0.0000^b	-0.0002^b	-0.0003^b
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Non Rout. Man.	-0.0002	-0.0001	0.0000	-0.0001	-0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Rout. Cognitive	0.0001^c	0.0001^b	-0.0000	0.0000	0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Rout. Manual	-0.0000	-0.0000	-0.0000^b	-0.0000	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Firm-level Controls	Yes	Yes	Yes	Yes	Yes
Industry-level Controls	Yes	Yes	Yes	Yes	Yes
Observations	97,471	97,394	170,365	35,775	63,794
Pseudo R^2	0.1381	0.2634	0.4077	0.2901	0.2593

Note: Industry-clustered standard errors in parentheses, ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1. The table reports marginal effects of a Probit model in which the dependent variable takes value one if the firm is exporting and zero if not. This is done for all five categories of firms: Stayers that start exporting in 2005 (Start), that give-up exporting after 1995 (Give-up), Firms that always export (Always), Exiters and Entrants. The estimated coefficients for firm-level and industry controls are available upon request.

Table 18: Exports, controlling for the change in the number of MNEs

	(1)	(2)	(3)	(4)	(5)
Dep.Var=1 if Exp>0	Start	Give-up	Always	Exiters	Entrants
Prob y=1	0.0164	0.0043	7.350e-04	0.0073	0.0138
Change in Tasks:					
Δ Analytical	0.0010[a]	0.0004[a]	0.0001[a]	0.0008[a]	0.0015[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Interactive	-0.0020[a]	-0.0004[a]	-0.0001[a]	-0.0009[a]	-0.0017[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Δ Non Rout. Man.	-0.0010[a]	-0.0004[b]	-0.0001[b]	-0.0004	-0.0012[b]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Rout. Cognitive	0.0005[a]	0.0003[a]	0.0001[b]	0.0003[a]	0.0007[b]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Δ Rout. Manual	-0.0004	-0.0000	-0.0000[b]	-0.0004[a]	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Change in the number of multinationals:					
Δ MNE	0.0181[a]	0.0037[a]	0.0013[a]	0.0076[a]	0.0082
	(0.005)	(0.001)	(0.000)	(0.003)	(0.007)
Firm-level Controls	Yes	Yes	Yes	Yes	Yes
Industry-level Controls	Yes	Yes	Yes	Yes	Yes
Observations	95,723	94,508	94,318	35,775	63,794
Pseudo R^2	0.1356	0.2302	0.4326	0.2768	0.2483

Note: Industry-clustered standard errors in parentheses, [a] p<0.01, [b] p<0.05, [c] p<0.1. The table reports marginal effects of a Probit model in which the dependent variable takes value one if the firm is exporting and zero if not. This is done for all five categories of firms: Stayers that start exporting in 2005 (Start), that give-up exporting after 1995 (Give-up), Firms that always export (Always), Exiters and Entrants. The estimated coefficients for firm-level and industry controls are available upon request.

Table 19: Exports of Goods

	(1)	(2)	(3)	(4)	(5)
Dep.Var=1 if Exp>0	Start	Give-up	Always	Exiters	Entrants
Prob y=1	0.0166	0.0038	7.539e-04	0.0070	0.0141
Change in Tasks:					
Δ Analytical	0.0027[a]	0.0042[a]	0.0036[a]	0.0087[a]	0.0042[a]
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Δ Interactive	-0.0004	0.0009	0.0046[a]	0.0083[c]	0.0024
	(0.002)	(0.002)	(0.002)	(0.005)	(0.002)
Δ Non Rout. Man.	-0.0016	-0.0013	-0.0027[b]	-0.0039	-0.0023
	(0.001)	(0.002)	(0.001)	(0.004)	(0.002)
Δ Rout. Cognitive	0.0009	-0.0001	0.0023[b]	0.0032	0.0016
	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)
Δ Rout. Manual	0.0007	0.0006	0.0016[a]	0.0017	0.0006
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Firm-level Controls	Yes	Yes	Yes	Yes	Yes
Industry-level Controls	Yes	Yes	Yes	Yes	Yes
Observations	82,699	81,457	81,442	31,138	58,714
Pseudo R^2	0.1433	0.2216	0.4402	0.2860	0.2531

Note: Industry-clustered standard errors in parentheses, [a] p<0.01, [b] p<0.05, [c] p<0.1. The table reports marginal effects of a Probit model in which the dependent variable takes value one if the firm is exporting and zero if not. This is done for all five categories of firms: Stayers that start exporting in 2005 (Start), that give-up exporting after 1995 (Give-up), Firms that always export (Always), Exiters and Entrants. The estimated coefficients for firm-level and industry controls are available upon request.