Crisis-Proof Services:
Why Trade in Services Did Not Suffer
During the 2008-2009 Collapse*

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Abstract

During the 2008-2009 crisis trade in goods experienced the deepest decline ever recorded. Surprisingly, trade in services came through the crisis unscathed and some service categories carelessly stuck to their growth paths. Using firm-product-destination exports for Belgium, we show that the particular resilience of services is explained by a significantly lower elasticity to demand in export markets. More specifically, services exports tend to decline on average 5% less than exports of goods following a 1% decrease in GDP growth in destination countries. Most of this effect is accounted for by business services, it is more pronounced with respect to durables than to consumable products and it is stronger for OECD exports than for non-OECD. In terms of economic magnitude, if goods had the same elasticity to GDP growth of services, they would have decreased of about half. Conversely, if services had the same elasticity of goods, their fall would have been more than thrice as much.

Keywords: Trade Collapse, Service Resilience, Services and Goods Trade.
JEL Classification: F10, F14, L80.

1   Introduction

Between the third quarter of 2008 and the second quarter of 2009, trade in goods experienced the steepest decline ever recorded, with both exports and imports unexpectedly falling four times more than income (Freund, 2009). The fall was very severe, highly synchronized across countries and mostly concentrated in the category of durable goods (Baldwin, 2009). In this period of economic turmoil, trade in services barely reacted to the crisis. The most important services continued growing strongly and steadily and only the category of transport services registered negative figures (Borchert and Mattoo, 2009; Francois and Woerz, 2009). This peculiar resilience is also unpredicted, since most of the studies analyzing trade in services at micro level suggest that trade in services shares the same characteristics as trade in goods.[1] Despite this intriguing incongruity, while a large amount of research has attempted to understand the causes of the "Great Trade Collapse" (Baldwin, 2009) for trade in goods,[2] the distinctive resilience of trade in services did not get the attention of the international trade literature.

Using firm-product-destination[3] exports data for Belgium, we show that the different reaction of services was the consequence of a lower elasticity to demand: following a 1% fall in GDP growth in destination countries, exports of services decrease 5% less than the exports of goods. This special characteristic of services is mostly accounted for by business services such as legal, management and accounting and it is more pronounced with respect to durable goods than consumables. Even during the negative economic shock, firms continued to demand external support for services that represent fundamental production inputs. Thus, services look like fixed costs for firms that want keep producing: they represent essential inputs for the production process, their flow must be continuous, it cannot be stored and it cannot easily be modified following clients' sales fluctuations. In terms of economic magnitude, if goods exports had the same elasticity to GDP growth of services exports, their decline would have been about half. Conversely, if services had the same elasticity as goods, they would have fallen three times more. Therefore, demand played a major role in the special resilience of services.

Many factors contributed to the 2008-2009 collapse for trade in goods. From the supply side firms suffered from a severe credit crunch (Chor and Manova, 2012; Auboin,

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[1]Breinlich and Criscuolo (2011) for the UK, Kelle and Kleinert (2010) for Germany, Walter and Dell'mour (2010) for Austria, Gaulier et al. (2011) for France, Federico and Tosti (2012) for Italy and Ariu (2012) for Belgium.

[2]See Baldwin (2009) for a review.

[3]For the sake of expositional clarity, we use the expression "product" also when we refer to a service.

2009) and the disruption of global value chains (Altomonte et al., 2012; Bems et al., 2011; Levchenko et al., 2010). At the demand level, there is evidence of a disproportionate fall in demand concentrated on durables and investment goods (Behrens et al., 2011; Bricongne et al., 2012; Eaton et al., 2011). A possible reason for the different reaction of services exports is that they did not suffer from the demand and/or supply determinants:

- services might represent different types of products in the customers' eyes. First, they are essential production inputs: for a firm it is hardly possible to continue producing without the constant provision of services like accounting, janitorial, call center, etc. Second, they are intangible, so they cannot be stored and it is not possible to use an "old" service. Third, they tend to be indivisible: their provision can hardly adjust following the fluctuations in the sales of clients.[4] For all these reasons, their demand might be more stable and less sensitive to short-term shocks. This feature can be rationalized, for example, by a lower elasticity to income for services in a non-homothetic demand system similar to that of Fieler (2011) and Caron et al. (2012) with a continuum of varieties of goods and services. Using this setting, the response of services to an income decline would be milder than that of goods. In the rest of the paper we will refer to this lower elasticity of demand as the *"demand channel"*.

- services might be less sensitive to credit crunches. First, this might be the consequence of a reduced need of external capital. On the one hand, this is related to the fact that many services can be traded over the internet, thus reducing the need for external finance to make the necessary investments to be able to export. On the other hand, payments are faster for services: production and consumption often coincide[5] and the risk of shipping delays are very low. So, the working capital needed to support the firm from the production to the delivery is lower. Moreover, this lack of payment delays lowers the need of export finance insurance.

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[4]For example, think about an accounting service: its value does not change if the sales of the customer firm increase or decrease.

[5]This is especially true for mode 2, 3 and 4 defined in the GATS. Mode 2, (Consumption Abroad) is when the service is consumed in the territory in which it has been produced by the resident of another country. Mode 4 (Presence of Natural Person) is when a supplier provides the service in another country sending one or more employees to that country. Mode 3 (Presence Abroad) is when the service is provided by a supplier through the commercial presence in the country of the consumer. Instead, mode 1 (Cross-Border) does not require physical proximity and is when a service is produced in one country and consumed in the territory of another country. Please note that our data contains modes 1, 2 and 4, but it does not distinguish among them. For more examples on the different modes, please refer to Ariu (2012) and Breinlich and Criscuolo (2011).

Second, service exporters might not be able to ask for external trade capital and may be used to work without. This is because services are intangible and highly customized. Thus, they have little value outside the seller-buyer link and they can hardly be used as collateral. We will refer to the lower sensitivity to credit shocks of services as the *"credit channel"*.

- from the global value chain perspective, the production of services tends to be more geographically concentrated due to the fact that they often require the physical proximity of customer and producer and they always represent a final product that can never be re-exported. Therefore, their production chain tends to be shorter and the trade partners more easily verifiable thanks to the physical proximity requirement. All these characteristics might lower the probability of a break in the chain and make it less dramatic and more easily manageable. We will refer to this as the *"global value chain channel"*.

Another possible explanation is related to the differences across firms trading services and those trading goods:

- service exporters are different types of firms. For example, there is evidence that they tend to be fewer but more productive than goods exporters (Ariu, 2012; Breinlich and Criscuolo, 2011). A more selective entry process for trade in services, possibly due to higher fixed costs of exporting, might allow only the most productive firms to export services. If this higher productivity is also accompanied by higher mark-ups, then service exporters might have more instruments to overcome short-term shocks.[6] In the same way, size, foreign ownership, multinational status and other firm characteristic might be more relevant for services and influence the capacity for service firms to react to the crisis. For instance, if service multinationals have broader networks than the manufacturing counterparts, they might more easily find new market space for their exports even during the crisis. Therefore, looking at these firm-level characteristics might provide evidence on the causes of the different response of service exporters to the crisis. We refer to this as the *"heterogeneity channel"*.

We test the role of the above mentioned channels in explaining the different behavior of services using very detailed data from Belgian firms. The analysis is divided into

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[6]For example, this is the case when using the above cited non-homothetic preferences of Fieler (2011) and Caron et al. (2012) together with a selection process similar to Melitz (2003).

three sections. In the first, we perform a descriptive comparison of goods and services trade by decomposing changes in Belgian exports into changes in the extensive and the intensive margins, where the former refers to changes in the average number of destination countries per firm and the average number of products exported per firm-country and the latter to the average exports per firm, country and product.[7] Keeping a descriptive spirit, in the second section we use a diff-in-diff approach similar to Behrens et al. (2011) in which we use the first semesters of 2007 and 2008 as the pre-treatment period and the first semesters of 2008 and 2009 as post-treatment period and we explore the differential post-treatment effect of the heterogeneity, credit, global value chain and demand channels separately for goods and services trade.[8] In the third part of the analysis we put together the information on goods and services and we perform a triple-difference analysis in which we compare changes in exports of services in the pre- and post-period with changes in exports of goods in the pre and post period by using only firms that export both goods and services. The goal is to understand the magnitude and statistical significance in the role played by the different channels for services and goods exports during the crisis. Moreover, we check the robustness of the results by applying the triple-difference strategy to matched "mono-exporters" of goods and services.

To date, Borchert and Mattoo (2009) represent the only paper analyzing trade in services during the crisis. Using aggregate US trade data, they are the first to show that services did not collapse during the crisis of 2008-2009. Then, using data on Indian exporters in the IT sector, they argue that services did not suffer from the 2008-2009 crisis because their demand is less cyclical and they rely less on external capital. The main contribution of this paper is to go beyond the descriptive evidence available and provide a micro-econometric analysis of the determinants of the different response of trade in goods and trade in services trade during the "Great Trade Collapse". Secondly, this is the first paper to describe the behavior of trade in services during the crisis at micro level by using a unique dataset on firm-country-product exports from Belgium during the 2008-2009 crisis. As highlighted by Behrens et al. (2011) and Bricongne et al. (2012) in the analysis of Belgian and French exporters of goods during the crisis, the big advantage of using data at the firm level is that we are able to disentangle the effects

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[7]Due to data limitations explained in the next section, we cannot analyze entry and exit dynamics. We restrain our analysis to the within-firm adjustment focusing on the firms that we observe continuously during the crisis.

[8]This analysis is made separately for trade in goods and trade in services. For both types of trade we run a different regression in which the change in exports between the first semesters of 2007 and 2008 represent the "normal" period and first semesters of 2008 and 2009 the "treatment" period.

of the crisis by looking at within-firm reallocations in terms of changes in the number of products, destination countries and average exports per country and product.

Thirdly, this paper builds on the large literature analyzing the effect of macroeconomic shocks on trade. Bernard et al. (2009) for the Asian crisis dissect the fall in exports of goods of US firms into the different margins, concluding, as in our case, that most of the action was on the intensive margin. Amiti and Weinstein (2011) and Iacovone and Zavacka (2009) show that exporters of goods relying more on external capital are those that suffer the most in times of financial crisis. With respect to the recent "Great Trade Collapse", the emerging consensus points to both demand and supply shocks as the main drivers behind the sudden fall. From the demand side, Behrens et al. (2011), Bricongne et al. (2012) and Eaton et al. (2011) provide evidence of a disproportionate fall in demand for "postponable" goods, such as consumer durables and investment goods. As pointed out by Alessandria et al. (2011), this pushed firms to make intensive use of inventories and to stop the provision of intermediates, thus reinforcing the negative effect on trade. Moreover, since "postponable" goods constitute a small part of countries' GDP, but a large share of international trade, this demand shock had dramatic consequences for trade in goods, but relatively little impact on GDP (Francois and Woerz, 2009; Levchenko et al., 2010). From the supply side, Chor and Manova (2012) and Auboin (2009) argue that the financial sector difficulties led to a severe credit crunch that prevented firms from getting enough funds to continue operating in the export markets for goods. As highlighted by Bems et al. (2011), Levchenko et al. (2010) and Altomonte et al. (2012), the interruption of a link in an international production chain can cause the destruction of the entire chain, thus having magnified effects on trade flows. Finally, Evenett (2009) and Jacks et al. (2011) argue that protectionist measures played a further negative role in the collapse. Our paper provides a new perspective to this literature, by adding the service dimension to the analysis of the trade collapse and by showing that services' exports are immune to short-term negative deviations of GDP growth in destination markets. Moreover, it shows that that the different reaction was not due to firm-level differences, since the same effect is observed both within and across firms. Finally, our analysis suggests that countries specializing in the international provision of services can enjoy higher relative stability of exports in times of short-term negative GDP growth shocks.

The paper is organized as follows: in section 2 we describe the data; in section 3 we show the descriptive statistics of the crisis; in section 4 we present our diff-in-diff analysis; in section 5 we develop the triple-diff approach and section 6 outlines some

concluding remarks and future research directions.

2 Data Description

The bulk of the dataset used in this paper is composed of three different datasets provided by the National Bank of Belgium (NBB henceforth) concerning trade in services, trade in goods and firm-level accounts.

Data on trade in services come from the NBB Trade in Services dataset used to compile the balance of payments and cover the period from 2006 to 2010. The dataset is formed using different surveys conducted by the NBB[9] and contains information about trade in services at the firm-destination-product level, so for any Belgian firm present in the dataset we have, depending on the survey, monthly or quarterly information on export values per type of product and destination country. Service products are listed in Table 5 and countries are classified using ISO 2-digit codes. We exclude from the analysis "services to affiliates" (code H7000) because this does not contain information on which specific service is traded and "goods included in the construction services" (code E0002) because this category does not strictly represent trade in services. The dataset captures more or less 60% of total exports of services by Belgium and about 40% of Belgian exporters and it is structured to be representative of all firms exporting services in terms of export size, exported services, firm size and geographical dispersion of exports. The survey nature of the dataset rules out any analysis of entry and exit patterns in foreign markets.[10] Therefore, the analysis of this paper will be focus solely on the firms that we observe continuously during the period of analysis.[11] This means that we are not able to make any analysis on across-firms adjustments, but we can still explore the service and product margins, and thus within-firm adjustments during the crisis. This limitation is not too serious, since entry and exit account for less then 2% of total exports for both goods and services (Ariu, 2012) and since entry and exit represent a marginal channel of adjustment for firms during the crisis (Behrens et al., 2011; Bricongne et al., 2012).[12] Moreover, despite this constraint, this is the only

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[9]For more information on the surveys see Table 4.

[10]The main problem is the fact that when a firm enters in the dataset, it is kept for some years even if after a few years it does not meet the thresholds to get into it. Moreover, even by excluding those firms by checking the conformity with the criteria, it would give an idea of the entry and exit into/from the survey but it is questionable whether this would also be representative of entry and exit into/from export markets.

[11]These continuing firms account for about 96% of exports and imports present in the surveys, so we can be confident that the data covers the bulk of Belgian trade

[12]Bernard et al. (2009) show that also during the Asian crisis the extensive margin was a minor

dataset available that enables an analysis of trade in services at the micro level during the 2008-2009 crisis.

Information on trade in goods is taken from the NBB Trade in Goods Dataset, which contains exports and imports of goods by Belgian firms at the firm-destination-product level. The data is collected monthly and comes from the Intrastat (Intra-European) and the Extrastat (Extra-European) declarations. Firms are identified thanks to the VAT number, countries are classified using the ISO 2-digit codes and products are classified using the HS nomenclature at 4-digit level. Data on firm-level accounts come from the Business Registrer covering the population of firms required to file their (unconsolidated) accounts with the NBB. From this dataset we take information on full-time equivalent employment, turnover, operating profits, equities, liabilities, stocks and purchases of intermediates for the year 2007. Unfortunately, turnover figures comprise both goods and services together and there is no information available to distinguish between the two. This prevents us from analyzing the dynamics of goods and services in the domestic market. Multinational and foreign ownership status of firms are taken from the NBB Survey of Foreign Direct Investments. Finally, we take information on GDP growth in destination countries from the IMF World Economic Outlook database (2012 version)[13] and information on daily exchange rates on the 1st of April of each year considered from the European Central Bank's Statistical Data Warehouse.[14]

3 The Crisis in Figures

As previously mentioned, the crisis hit goods more severely than services. Looking at monthly exports of goods and services for Belgium in Figure 1, we can see that after September 2008 there is a clear rupture and exports of goods fell by about 30%. For services instead, there is no definite sign of discontinuity and they kept about the same pace. This phenomenon was not only confined to Belgium, but worldwide and significant in terms of magnitude. In Tables 1, 2 and 3, we plot the ratio of quarterly exports of services over exports of goods for OECD countries, with the first quarter of 2006 normalized to one.[15] We observe that, following the Lehman Brothers failure in the third quarter of 2008 (represented by the red vertical line), the increase in the ratio for Belgium -about 25%- is similar to that of the UK, USA, Germany and Mexico

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adjustment channel and all the action was concentrated on the intensive margin.

[13]Available at http://www.imf.org/external/pubs/ft/weo/2012/01/weodata/index.aspx

[14]Available at: http://sdw.ecb.europa.eu/

[15]Data come from the OECD database available at http://stats.oecd.org

and it is in line with the average for the OECD. This pattern is particularly strong for Canada, Austria, France and Japan - for which we observe an increase of about 40%- while only in very few countries it is not clearly present (Australia, Ireland, New Zealand, Greece and Iceland).

In the rest of the paper the analysis will be focused only on the first semester of each year -as also in Behrens et al. (2011)-. This choice is made in order to i) reduce seasonality issues evident from the monthly data; ii) include the maximum number of firms (some firms declare exports only quarterly and most of the firms do not export every month; therefore, making an analysis on continuing firms at monthly level would reduce the number of firms dramatically); iii) do a clear pre-post comparison avoiding the shock present in the statistics of the third and fourth quarters of 2008. The first step towards understanding the composition of the changes in Belgium's exports is to decompose total Belgian exports at time t (where, in this case $t = \{S12008, S12009\}$), of trade type y (where $y = \{Services, Goods\}$), X_t^y, into the number of firms f_t, the average number of served markets per firm $\bar{c}_t$, the average number of exported products per market-firm $\bar{p}_t$ and the average exports per firm-market-product (service) $\bar{x}_t$: $X_t^y = f^y * \bar{c}_t^y * \bar{p}_t^y * \bar{x}_t^y$. By taking the ratio between the first semester of 2008 and the first semester of 2009, we can thus break down the change in total exports, $\Delta X^y = \frac{X_{2009}^y}{X_{2008}^y}$, into the change in the extensive margins (firms-services-markets) and the change in the intensive margin (the average exports per firm-market-service):

$$\Delta X^y = \Delta f^y * \Delta \bar{c}^y * \Delta \bar{p}^y * \Delta \bar{x}^y \qquad (1)$$

Since we focus only on continuing firms, the change in the number of firms, Δf, is equal to one.[16] Looking at Table 6, we can appreciate that the change in Belgian exports between the first two semesters of 2008 and 2009 is -26.81% for goods and only -3.13% for services. Even if these decreases differ dramatically in quantitative terms, qualitatively they are both generated almost entirely by a reduction in the quantities exported per market and product that is only partially counterbalanced (at least for services) by an increase in the average number of products. In the case of both for goods and services trade, Belgian firms did not significantly leave destination markets: they decreased of only -0.33% for services and -1.41% for goods. They stepped up the average number of products provided per destination country: a 2% increase for services and 1.83% for goods.[17] They cut significantly the average exports per market-product

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[16]Which means that it does not contribute to explaining the growth of exports.

[17]For goods exports we use the HS4 classification. Using a more aggregate classification decreases marginally the contribution of the average number of products and increases that of the intensive

with a decline of -4.72% for services and a dramatic fall of -27.09% for goods. The huge difference in the reaction of the average quantities exported per market and product suggests that the intensive margin is the key to understanding the different reaction of services and goods trade.

By dividing Belgian exports into the different product categories, we can appreciate in Table 7 a wide heterogeneity across products, both for services and goods. Services related to transport experienced a drop commensurate to that of goods. On the other hand, business and telecommunication services continued their sustained growth. Therefore, apart from transport services, the other services did not suffer from the crisis and they continued their normal growth paths. If we consider also that financial, insurance and business services represent more than 50% of Belgian exports, this is quite an important result that can have relevant policy implications. For exports of goods, all product categories experienced a decline, yet the bulk of the collapse is accounted for the intermediates and durable goods. By decomposing Belgian exports into EU and non-EU and to OECD and non-OECD in Table 8, we see a mixed country pattern. Intra-EU and extra-OECD exports of services experienced a bigger drop than non-EU and OECD. This is because most of the extra-OECD trade is represented by transport of services, which we have seen is the only service category that collapsed. For exports of goods on the other hand, the fall is similar in all the country categories.

To discern differences across firms, in Table 9 we divide exports following the multinational and foreign ownership status, size and financial situation of the exporter. The numbers say that, for services, the non-multinational and non foreign-owned firms were hit by the crisis, while multinational and foreign-owned firms registered positive figures. However, these declines are much smaller than those for goods, for which we do not observe any heterogeneity following the multinational and foreign ownership status. Finally, by defining a firm as big if it has full-time equivalent employment higher than the median exporter in the same industry and as financially exposed if it has higher external financial dependency than the median exporter in the same industry, we can see from Table 10 that there is no heterogeneity for firms exporting goods, while small firms exporting services suffered more from the crisis than big ones. These results suggest that the heterogeneity channel played different roles for services with respect to goods. A more selective entry process -due, for example, to higher fixed costs of exporting- might have led only the more resilient firms to export services. So, only the "weakest" exporters within this selected group suffered (mildly) from the crisis. At the same time,

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margin.

the credit constraint channel might have been binding for all goods exporters, but not for all service exporters. Big, foreign-owned and multinational service exporters might have been more able to exploit their network and find the capital needed to export, thus being able to keep exporting during the crisis.

Summing up the descriptive evidence on the crisis in Belgium, it looks like exports of services did not suffer as much as goods exports. Most of the adjustment was accounted by a decrease in the intensive margin which was more dramatic for goods than for services. By contrast, the role of the extensive margin was less important, with both service and goods exporters reducing the number of destinations slightly and increasing the number of products per destination. In the case of goods, the fall was evenly spread in geographical terms, while for services only non-OECD exports suffered. Moreover, we observe great heterogeneity looking at the different product types. In particular, transport services dropped similarly to trade in goods, while professional, financial and telecommunication services continued growing at a very high pace. For trade in goods, we find that the decrease is mostly due to a reduction in intermediates and durable goods, while other types of goods declined more smoothly. Finally, we observe an important heterogeneous response based on ownership and multinational status, size and financial situation for exports of services, but not for exports of goods. This evidence is suggestive of the fact that both the heterogeneity and credit constraint channel might have played a different role for services.

4 Looking for Clues

To understand which factors could lead to a different response for services, we use a diff-in-diff approach similar to Behrens et al. (2011), in which the change in the logged exports to a particular market c, of a particular product p, by a Belgian firm f between S12007 and S12008, and S12008 and S12009, $\Delta X_{fcp}^{y,t} = log X_{fcp}^{y,t+1} - log X_{fcp}^{y,t}$, is regressed, separately for goods and services (remember that $y = \{Services, Goods\}$), against the treatment dummy T^t, represented by the crisis; a vector containing firm, country and product characteristics that capture the effect of demand, credit constraint, heterogeneity and global value chain channels: $Z_{fcp}^{y,t}$, and the interaction of this vector with the treatment dummy, $Z_{fcp}^{y,t} * T^t$.

$$\Delta X_{fcp}^{y,t} = \alpha + \beta_0' T^t + \beta_1' Z_{fcp}^{y,t} + \beta_2'^t Z_{fcp}^{y,t} * T^t + \epsilon_{fcp}^t \tag{2}$$

In this specification, β_0' represents the treatment specific effect, β_1' the contribution of

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the demand, credit constraint, heterogeneity and global value chain channels in normal times and β_2' the contribution of the same channels during the crisis. The identifying assumption, in the absence of a true control group (which would be represented by firms that were not exposed to the crisis), is based on the assumption that the treatment had differential effects on firms depending on covariates. Our independent variables are meant to capture the different channels that might have led to the different reaction of services. Table 11 provides detailed explanation about their construction and their sources. For the demand channel, we use the GDP growth of destination countries. While not being the perfect variable for capturing the export demand side strictly, we believe that it can proxy well the overall demand conditions in the export markets. Moreover, it suffers less from endogeneity issues than, for example, the change in overall imports in destination markets. To capture the heterogeneity channel, we use the multinational and foreign ownership status, the productivity and the size of the firm. These variables should shed some light on the role that firm-characteristics played for services and goods exports. For the global value chain channel, we use the share of intermediates, the share of exports over sales, the share of imports over intermediates, the importance of imports and exports over the total turnover and the importance of the stocks. All these measures provide evidence of the degree to which firms are oriented to foreign markets for their sales and how much they rely on external sources for their inputs. For the credit constraint channel we use the external financial dependence, the share of debts over liabilities, the share of long-term debts and the share of financial debts. The external financial dependence captures the degree to which investments are not covered by internal resources, capturing the need of external funding to get liquidity. The share of debts over liabilities indicates the importance of debts in relation to the overall liabilities. The share of long term debts measures the leverage of the firm and so the degree to which the firm is free to use its liquidity. The idea is that the higher the share of short-term debts, the lower the freedom to use the liquidity. The share of financial debts controls for how much firms rely on financial debts rather than on commercial ones.

In order to temporarily avoid issues related to the multicollinearity that might arise from the use of many firm-level variables together, we perform a principal component analysis. More specifically, we collapse all the variables pertaining to a channel into a synthetic standardized variable capturing their maximum common variability. Besides the different channels, we use regional dummies to control for regional trends, the exchange rates to control for the strategic use of currencies and industry dummies to

control for industry-level dynamics. Since we do not have product characteristics that can be comparable across goods and services, we use service or product dummies to control for heterogeneous responses across different products.[18] Given that our variables of interest vary along three dimensions (firm, product and country), we use the multi-level clustering procedure developed by Cameron et al. (2011) to correct standard errors. Finally, to alleviate endogeneity issues of our firm-level variables, we use the balance sheet data from 2007 only and trade data from 2006 for computing export and import to turnover ratios.

The left hand side of Table 12 shows the results for goods exports. Both the heterogeneity and the demand channel show significant coefficients for both the normal period (β_1) and the crisis period (β_2) while the global value chain and the financial constraints do not. The positive coefficient of β_1 and the negative of β_2 for the heterogeneity channel mean that biggest, more productive, foreign owned or multinational firms are those, in terms of export growth, that tend to grow the most during normal times and that suffered the least during the crisis. Looking at the demand channel, we see that the growth of goods exports follows GDP growth in destination countries in normal times: a one percent increase in GDP growth is associated with a 1.01% increase in exports. This effect is magnified during crises: a one percent decrease in GDP growth is associated with a decrease in export values of 2.5%.[19] Therefore, the demand represented an important booster for the export collapse and it accounted for almost 50% of the fall.[20].

The insignificant coefficients for the global value chain and the financial constraints channels suggest that they did not play a significant role during crisis. However, it is also possible that the heterogeneity channel is capturing part of that variation. For instance, it is known that multinationals can compensate financial market imperfections (Manova et al., 2009). Therefore, the multinational status might capture part of the financial constraint variation. At the same time, while we use standard measures suggested by the literature,[21] the debate on which variable should be used for capturing the credit constraints is still open. The main issue is that they might capture both demand and supply components, thus raising potential endogeneity concerns. In the next section,

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[18]Please note that in order to have the same level of disaggregation between services and goods, we use the HS classification at the 2-digit level.

[19]This is simply given by the sum of the estimated coefficient for normal time, 0.0101 and the coefficient for the crisis time, 0.0149.

[20]This result is computed assuming that the growth rates of GDP in 2008-2009 were the same as in 2007-2008.

[21]See for example Manova and Yu (2012), Whited (1992), Fazzari and Petersen (1993), Greenaway et al. (2007) and Knight et al. (2010)

we will delve deeper into these issues.

Switching to the right-hand part of Table 12, we can see that the demand channel did not play any role for trade in services. Notably, the most important factor explaining the fall for trade in goods does not have any effect on the growth of trade in services both in normal times and crisis time. So, the growth of trade in services is not related to changes in the aggregate demand in destination markets.[22] Several features can explain this result. From the demand point of view, services represent essential inputs for the production process: a company without its call center, janitorial, accounting or legal services can hardly continue producing. At the same time, services are intangible: this means that they cannot be stored and their flow must be continuous, thus forcing firms to buy services to keep the production process active. Finally, services are often not directly related to the size of the customer production: the value of audit, advisory and call center services purchased by a firm do not necessarily change following a reduction in the sales of the firm importing the service. These three characteristics -essentiality, non-storability and size independence- of services make them look like a fixed cost that firms have to pay to ensure the continuity of the production process. Therefore, short-term shocks like the 2008-2009 crisis do not have any significant impact on the international flows of services.

Similarly, the heterogeneity channel did not play any role both before and during the crisis. This fact would be in line with the selection story based on higher fixed costs for exporting services that allows only a few, but more productive and thus more similar firms to export markets. Thus, the crisis did not have heterogeneous effects based on size, productivity and foreign ownership or multinational status within the more homogeneous group of service exporters. With respect to the credit constraint channel, we do not observe any effect for services exports. Different factors can explain this insensitivity of services with respect to the credit constraints. On the one hand, many services are traded over the internet and even for the services provided in person, the shipment delays are very limited. Therefore, they do not need major investments to be traded internationally and the risk associated to the shipment is lessened, thus service exporters' need for external capital is milder than for goods. On the other hand, services can hardly be used as collateral: first, they are intangible and it is hard to objectively value something that is immaterial; second, they are usually very customized and they have little value outside the specific contract between two parties. Therefore, service exporters might not even be able to ask for external trade capital

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[22]Please note that this result does not preclude the levels of services exports to be significantly correlated to the levels of GDP in destination countries, for example, in a gravity setting.

and thus be less sensitive to credit shocks. The only significant coefficient concerns the global value chain channel. Firms more involved in foreign markets were the ones growing the least during normal times, but the crisis reversed this trend. So, smaller exporters and importers were catching up with the biggest ones, but the crisis inverted this pattern.

By disaggregating each principal component into their different elements it is possible to more finely characterize the results. Table 13 shows that for exports of goods, the biggest and most productive firms are those that benefit the most from the growth of GDP in destination countries and they are the ones that suffered the least from the crisis. In line with the previous analysis, global value chains and financial channels do not play a role, while most of the effect on exports is captured by the demand channel. These results are not driven by collinearity problems, as it is clear form the correlations across variables listed in Table 14. One should not be surprised by the low values of the R^2 of both specifications. Using firm-level data involves the use of a very high number of observations that mechanically decrease the amount of explained variance: similar studies such as Behrens et al. (2011) and Altomonte et al. (2012) have comparable values for the same statistic. Finally, even if R^2 tends to be low, the F-test is highly significant. Therefore, we can be confident on our empirical strategy.

5   Investigating Proofs

The previous section highlighted the different role that supply and demand factors had on services and goods during the crisis. In this section, we delve deeper into the analysis and we test whether the different channels had a significant different effect on services exports with respect to goods and quantify the economic magnitude. To do so, we need to compare services exports with goods exports and thus service exporters with goods exporters. We follow two complementary strategies. In the first, we consider only firms that export both services and goods, the "bi-exporters". In the second, we focus solely on the "mono-exporters" and for every service exporter we find the closest goods exporter by applying propensity score matching.[23] The advantage of using the first method is that it is like performing a "perfect matching" and so we rule out any difference across goods and services related to both observable and unobservable

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[23]We present results using Mahalanobis Matching (with replacement) where firms are matched in terms of: size, productivity, capital intensity, average wage, multinational and foreign ownership status. Using other matching functions like Nearest Neighbor or Kernel Matching does not change the results. Table 15 reports the statistics and differences for the control and the treatment group.

components of supply. The advantage of the second is that the results are not influenced by interactions across goods and services within the same firm. Moreover, the first can provide evidence on the within-firm effects of the different channels and the second complements by providing the across-firm perspective.

With respect to the previous analysis, we have to drop the product dimension since we cannot say which good should be matched with a particular service and vice-versa. Therefore, the unit of analysis is represented by the change in exports of a firm f in a country c at time t, ΔX_{fct}. The interaction between a dummy indicating the service flow S_f, the treatment dummy for the crisis T^t and the variable capturing one of the channels, will provide evidence on the differential impact the channel on exports of services with respect to exports of goods during the crisis. This triple-difference strategy, in the case of the demand channel, can be expressed analytically as:

$$\Delta X_{fct} = \alpha + \beta'_0 T^t + \beta'_1 GDP_c^t + \beta'_2 GDP_c^t * T^t + \gamma'_0 S_f + \gamma'_1 S_f * T^t + \gamma'_2 S_f * GDP_c^t + \gamma'_3 S_f * GDP_c^t * T^t + \epsilon_{fc}^t \quad (3)$$

Where β'_0, β'_1 and β'_2 have the same interpretation as the diff-in-diff strategy we used before. γ'_0 is the specific treatment effect controlling for differences across goods and services. γ'_1 captures the different response across goods and services during the crisis. γ'_2 controls for specific differences in the effect of GDP growth across goods and services. Our variable of interest, γ'_3 captures the differential effect of GDP growth on export of services with respect to exports of goods during the crisis. Since GDP growth is at the country level, we cluster standard errors accordingly. Moreover, to control for possible firm-level shocks, we use firm-year dummies. Looking at the estimated coefficient of γ'_3 in the first column of Table 16 (panel a), we can see that the reaction of services' exports to the income shock was significantly different from that of goods' exports. In particular, to a one percent decline in GDP growth, services exports decrease 5% less than exports of goods. By using the "matched" mono-exporters, and performing the same analysis, we can see from the first column of Table 16 (panel b) that the results are the same both qualitatively and very similar also in quantitative terms. Therefore, the different reaction of services holds both within and across firms and it is not influenced by the fact that bi-exporters might represent a particular category of exporters. In order to quantify the magnitude of this result, we can suppose exports of goods having the same elasticity as services. In this hypothetical case, the fall of goods would have been about half the size. Conversely, if we suppose services exports having the same elasticity of goods, they would have fallen three times as much.[24] Therefore,

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[24]This is simply done by comparing the predicted change in exports when the indicator variable S_f indicates services and when instead indicates goods.

the demand channel played a substantial role in the special resilience of services.

In the descriptive part of the paper, we observed that most of the decline in the exports of goods was accounted by durable goods. At the same time, while transport services were collapsing as much as goods, financial, telecommunication and business services did not suffer at all the crisis. To check whether we observe the same patterns and refine our results, we divide exports of goods and services into the different product categories and we apply the same type of analysis for each of them. We divide exports of goods into the exports of durable (or postponable) goods and exports of non-durable (or consumables). Not surprisingly, results in columns 2 and 3 of Table 16 indicate that the resilience of services is more important with respect to durable goods than to consumables. Therefore, services look more similar to necessities rather than to postponable products and this result reinforces the idea that services represent non-discretionary components of the production process. In columns 4-10 of Table 16, we present the results for exports of the different service categories. As can be seen from the magnitude and significance of the coefficients, most of the effect is accounted by the Business Services. It is possible that firms during the crisis might have still needed external support and the demand for services like consultancies, legal, audit, remained relatively high besides the economic downturn. Moreover, the results on business services reinforce the idea that they represent necessary fixed costs for firms. Finally, in columns 11-12 of Table 16, we distinguish between OECD and non-OECD exports. Most of the effect comes from OECD destination markets, so only exports towards developed economies enjoyed a significant effect of GDP growth. This result should be interpreted carefully because most of the Belgian exports go to OECD countries (about 70%) and most of the trade in services outside the OECD is represented by transport services. So, the variation might not be enough to identify the same effect also on non-OECD export markets.

In the case of the credit constraint channel, the same interaction strategy will provide evidence of differential effects of the financial situation on services with respect to goods. The only differences are that we cluster standard errors at the firm level and we use country-year dummies to control for demand determinants. The results in Table 17 do not provide as solid results as in the case of GDP growth. In most of the specifications the coefficient is not significant, so we do not find strong evidence supporting a different role of credit constraints for exports of services relative to exports of goods during the crisis. This result holds both for "bi-exporters" and "mono-exporters", differentiating goods and services into their different categories and interacting the financial constraint

17

variable with the GDP growth. Moreover, it holds even when splitting the principal component into the different variables composing it. So, to the extent that our variables are able to capture the credit constraints faced by exporters, we do not find any significant role for them in explaining the different reaction of services exports. Both for the heterogeneity channel in Table 18 and for the global value chain channel in Table 19, we do not find any significant effect both looking at bi-exporters and mono-exporters. Therefore, both channels were not a central force in explaining the resilience of services.

6   Conclusions

This paper shows that exports of services did not suffer from the 2008-2009 crisis because their demand tends to be more immune to short-term shocks than that of goods exports. To a one percent decrease in GDP growth, services exports decrease 5% less than the exports of goods. This peculiar resilience of trade in services is more pronounced with respect to durable goods than to consumables and it is mostly accounted for by the business services category. Economically speaking, these results are particularly important: if goods had the same elasticity to GDP growth as services, they would have fallen by about half. Conversely, if services had the same elasticity as goods, their fall would have been more than three times as much. Therefore, countries specializing their exports towards services can benefit from a lower sensitivity to short-term demand shocks, thus alleviating the consequences of a short-term economic turmoil.

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Figure 1: Belgian Monthly Exports 2006-2010
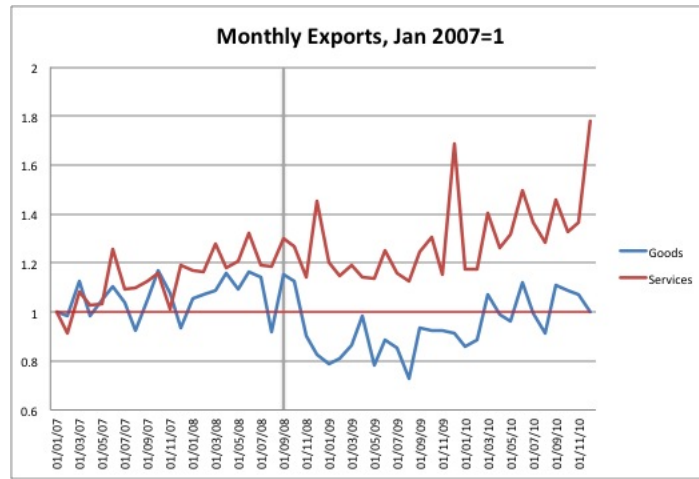
Table 1: Quarterly Ratio of $\frac{Services}{Goods}$ Exports, Q1 2006=1
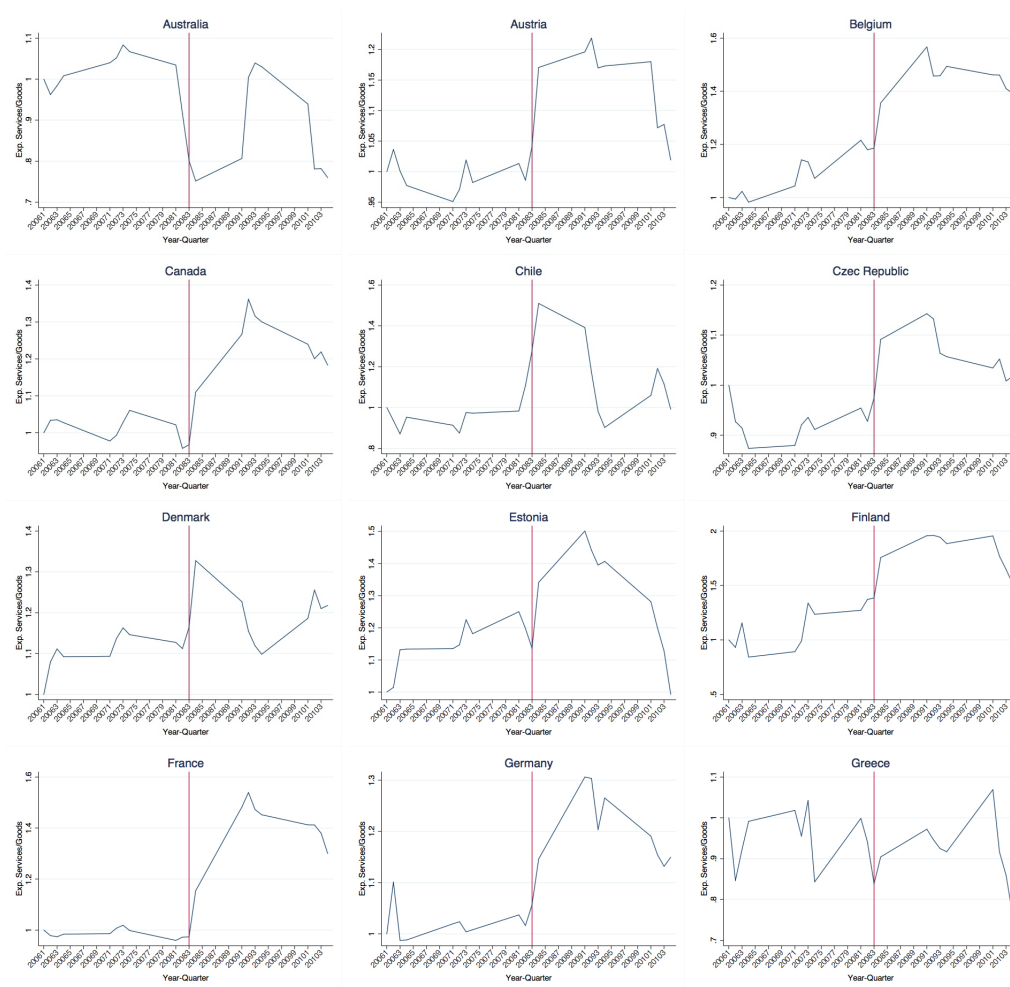
Table 2: Quarterly Ratio of $\frac{Services}{Goods}$ Exports, Q1 2006=1
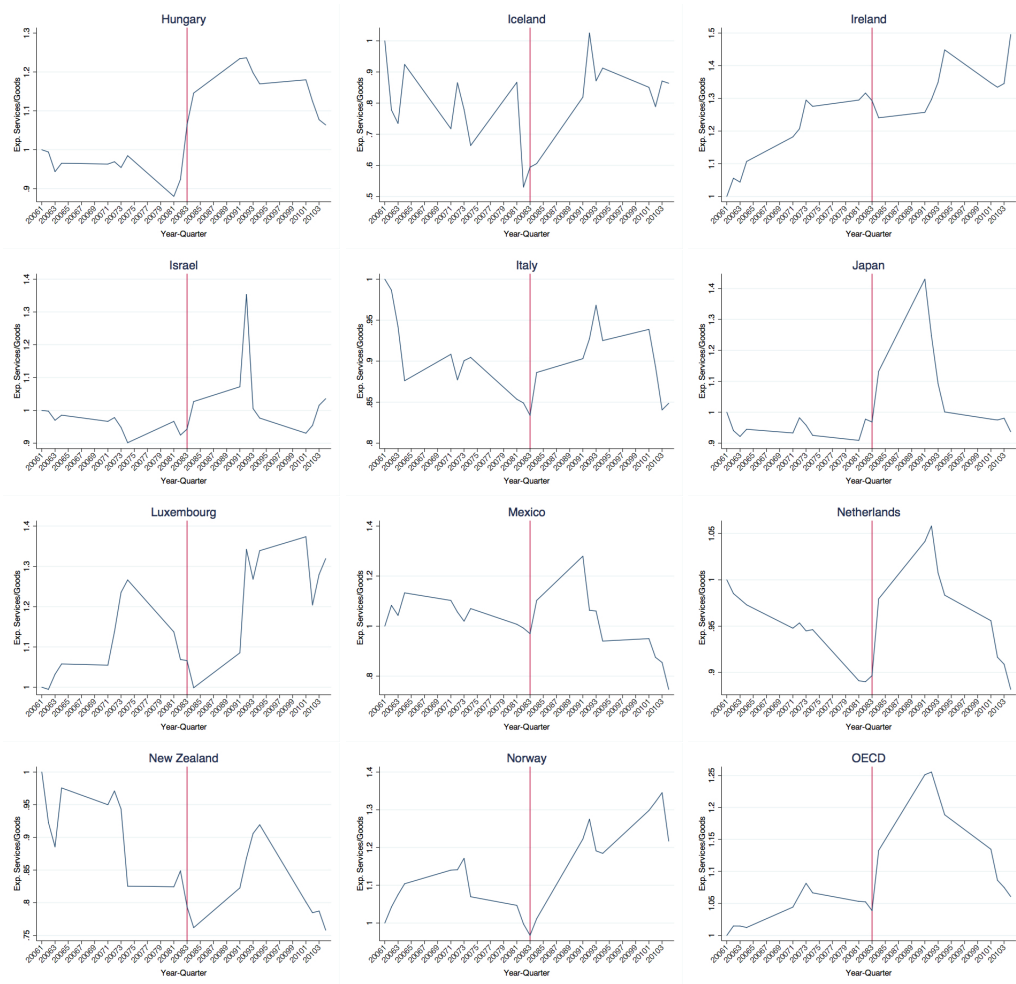
Table 3: Quarterly Ratio of $\frac{Services}{Goods}$ Exports, Q1 2006=1
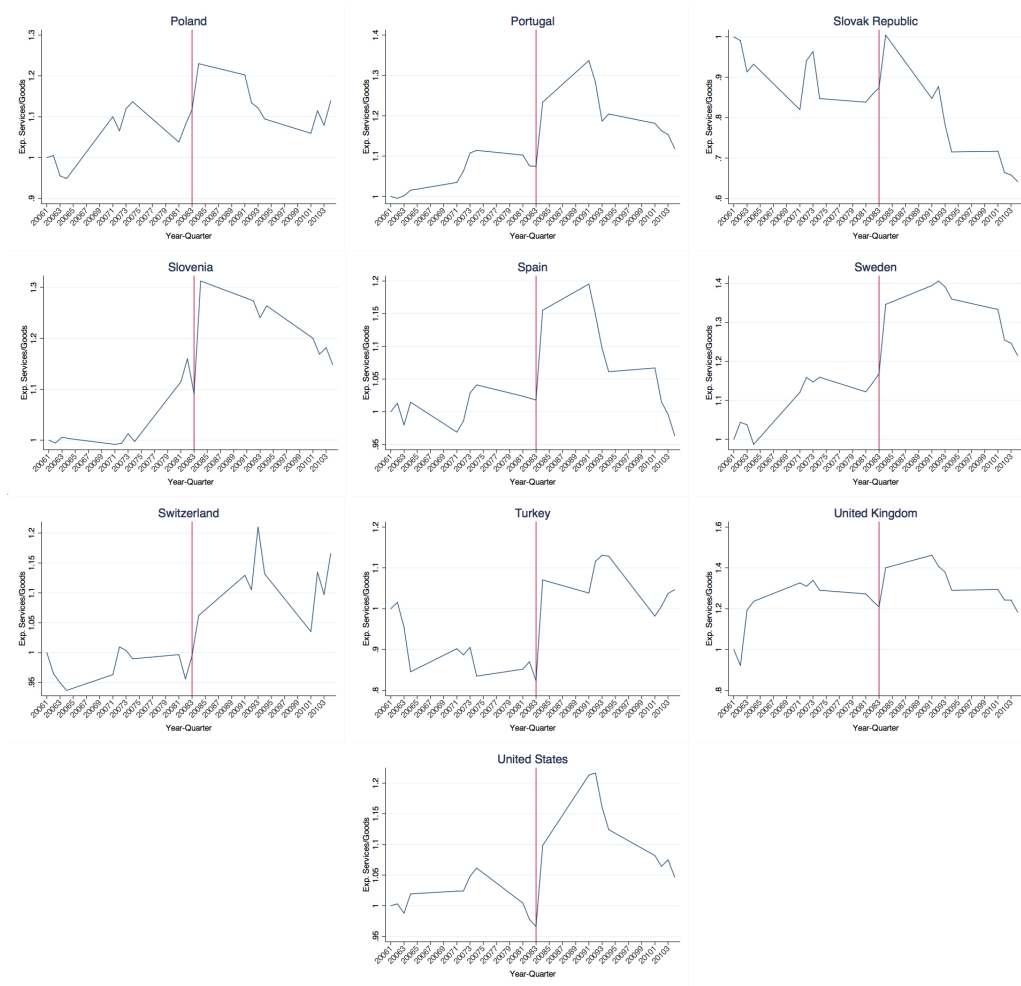
Table 4: Overview of the NBB Surveys on Trade in Services

Survey Name	Frequency	Mandatory declaration criteria	Services Targed
F01DGS	M	€10M annual Intrastat or €5M monthly Intrastat or €1M annual Extrastat	All
F01CDC	M	List of firms in Law n 187 of 30.12.1982	All
F01MER	M/Q	€10M annual Intrastat or €5M monthly Intrastat or €1M annual Extrastat	Merchanting
F03MER	M/Q	All firms declaring €10M Intrastat	Merchanting
F03CMS	M/Q/A	€1000 annual Intrastat or €5000 monthly Intrastat or €1000 annual Extrastat	All except Transport, Merchanting, Telecommunications, Insurance, Construction, Energy
F13CON	M/Q	All firms	Construction
F23CON	M/Q	All firms	Energy, Recycling, Real Estate
F03TRP	M/Q/A	All firms	Transport
F03AVS	Q	All firms	Telecommunications
F02BRO	M/Q	All firms with more than 10 employees	Insurance
F02CCI	M	All payments with credit cards not included in the other surveys	All
F02TRA	M/Q	Travel Agencies with more than 10M annual turnover	Travel

Note: This table presents the different surveys that constitute the NBB Trade in Services dataset from 2006 onwards, their frequency (M stands for monthly, Q for quarterly and A for annual), the criteria to make the declaration mandatory and the services targeted by the each survey. All values are in Euros.

Table 5: Service Categories

BUSINESS SERVICES
IT services

G0001	IT services	B1101	Passenger transport by different means of transportation
G0002	Repair services for IT	B1102	Freight transport by different means of transportation
G1000	Information services	B1103	Agency services for transport of passenger (different means of transportation)

Commission Fees

G5000	Franchising services	B1200	Satellite launch services and freight transportation in the space
G6000	Patent services	B2500	Passenger
G7000	Services for intangible investments	B3500	Auxiliary services to transport
H0000	Other commissions	B4000	Auxiliary services to different transport modes
		B4500	Any rental with crew

Technical and Business Services

H1000	Legal services
H1100	Accounting services
H1500	Consulting services
H2000	Marketing and opinion polling services
H3000	Research and development services
H4000	Architectural services
H5000	Waste treatment services
H5101	Agricultural and mining services
H5102	Local services
H6100	Secretarial services
H6200	Security services
H6300	Translation services
H6400	Photographic services
H6500	Janitorial services
H7000*	Services to affiliates
H8000	Audio-visual services
H9000	Educational services
H9100	Health service
H9200	Other cultural and personal services

SERVICES TO NON RESIDENTS
Agency Services

C0000	Conference fees
C0301	Car rental services
C0302	Excursion fees
C0303	Cruises
C0304	Agency services for concerts
C0401	Agency services for sport and cultural events
C0402	Agency services for tourism
C1301	Car dealers services
C2301	Repair services
C9000	Teaching services
C9100	Healthcare services

TELECOMMUNICATION SERVICES
Postal and Communication services

D0001	Postal services
D0002	Communication services

Telecommunication services

D1000	Telecommunication services

TRANSPORT SERVICES
Sea Transport

B0001	Freight
B0002	Boat rental for freight transportation
B0003	Transport of floating devices
B2001	Passenger
B2002	Boat rental for passenger transportation
B2003	Agency services for transport of passengers
B3000	Auxiliary services to sea transport

CONSTRUCTION SERVICES

E0001	Construction services abroad for less than one year
E0002*	Goods included in the construction services
E0003	Infrastructure reparation
E0100	Construction services abroad for less than one year (sub-tendered)
E0200	Construction services in Belgium for a foreign company (sub-tendered)
E0301	Construction services in Belgium for a sub-tendered foreign company (sub-tendered)
E0302	Purchase of construction services (only for imports)
E5300	Construction and installation services in Belgium (for a foreign company)
E5400	Construction and installation services abroad

Air Transport

B0101	Freight
B0102	Plane rental for freight transportation
B2101	Passenger
B2102	Plane rental for passenger transportation
B2103	Agency services for transport of passengers
B3100	Auxiliary services to air transport

FINANCIAL AND INSURANCE SERVICES
Insurance Services

F1000	Insurance premium against theft, damage and loss of freight
F1100	Freight insurance
F2000	Other insurances

Rail Transport

B0201	Freight
B0202	Train rental for freight transport
B2201	Passenger
B2202	Train rental for passenger transport
B2203	Agency services for transport of passengers
B3200	Auxiliary services to rail transport

F2100	Indemnities related to other insurance
F3000	Re-insurance premium
F3100	Indemnities for re-insurance
F4000	Fees, consultancies and other services related to insurance and re-insurance

Financial Services

Road Transport

B0301	Freight
B0302	Truck Rentals for freight transport
B2301	Passenger
B2302	Bus rentals for passenger transport
B2303	Agency services for transport of passengers
B3300	Auxiliary services to road transport

F5001	Financial services from postal companies
F5002	Financial services
F6001	Financial services related to transport of passenger
F6002	Financial services related to transport of freight
F6003	Operational leasing
F6004	Other operational leasing
F6005	Real estate services to international organizations
F6006	Real estate services to non residents

Internal Waters Transport

B0401	Freight
B0402	Boat rental for freight transport
B2401	Boat rental for passenger transport
B3400	Auxiliary services to internal waters transport

F6301	Financial leasing for passenger transport
F6302	Financial leasing for freight transport
F6303	Financial leasing for IT
F6304	Other financial leasing
F6305	Financial leasing for real estate services to international institutions

Other Transport

B0500	Freight
B1000	Freight transport by pipes and electricity transport

F6306	Other financial leasing

Note: This table presents the different service categories present in the different surveys of the NBB. Codes marked with an asterisk (*) are excluded from the analysis.

Table 6: Change in the Margins of Belgian Exports (2008S1-2009S1)

Panel a: Exports

	Services			Goods		
Period	2008S1	2009S1	$(\Delta$-1)%	2008S1	2009S1	$(\Delta$-1)%
Total	21,757	21,075	-3.13%	99,534	72,853	-26.81%
Extensive Margins:						
Firms	2,107	2,107	-	12,964	12,964	-
Countries	11.41	11.37	-0.33%	8.58	8.46	-1.41%
Products	1.52	1.55	2.00%	3.72	3.79	1.83%
Intensive Margin:						
Average Sales	0.60	0.57	-4.72%	0.24	0.18	-27.09%

Note: This table presents the decomposition of the growth rate of Belgian exports between the first semester of 2008 and the first semester 2009 into the extensive margin (average number of export markets per firm and average number of product per market-firm) and the intensive margin (average exports per firm, market and product).

Table 7: Change in the Margins of Belgian Exports (2008S1-2009S1) by Product and Service Type

	Total	Extensive Margins		Intensive
	% Change	Countries	Services	Margin
Panel a: Services				
Goods Transport	-22.25	-3.77	-0.33	-18.94
Passenger Transport	-1.98	1.94	1.80	-5.55
Auxiliary Services for Transport	-10.62	-4.21	1.99	-8.52
Service to non-Residents	-0.34	-0.14	1.29	-1.47
Telecommunication Services	11.66	5.13	-1.47	7.80
Construction Services	-0.79	-2.77	-0.82	2.87
Financial and Insurance Services	21.49	1.59	0.26	19.27
Business Services	4.90	-0.23	2.11	2.97
Panel b: Goods				
Intermediates	-31.24	-0.61	1.51	-31.85
Capital Goods	-23.64	-1.62	1.87	-23.81
Consumer Durables	-38.23	-4.21	1.99	-36.00
Consumer non Durables	-7.74	0.17	0.36	-8.22
Energy	-44.47	-3.94	0.04	-42.22
Other	-25.51	-1.84	0.28	-24.33

Note: This table presents the decomposition of the growth rate of Belgian exports between the first semester of 2008 and the first semester 2009 for EU and non-EU countries, type of service exported, multinational status of the firm and type of firm.

Table 8: Change in the Margins of Belgian Exports (2008S1-2009S1) by Country of Destination

	Total	Extensive Margins		Intensive
	% Change	Countries	Services	Margin
Panel a: Services				
EU	-4.30	-1.08	1.94	-5.09
non-EU	-1.14	0.50	2.17	-3.73
OECD	-1.05	-0.84	1.74	-1.92
non-OECD	-14.85	-0.09	2.80	-17.09
Panel b: Goods				
EU	-26.73	-3.15	1.54	-25.50
non-EU	-27.27	-0.76	4.14	-29.63
OECD	-26.64	-1.92	2.09	-26.74
non-OECD	-27.75	-0.59	1.58	-28.45

Note: This table presents the decomposition of the growth rate of Belgian exports between the first semester of 2008 and the first semester 2009 for EU, non-EU, OECD and non-OECD countries.

Table 9: Change in the Margins of Belgian Exports (2008S1-2009S1) by Ownership Status

	Total	Extensive Margins		Intensive
	% Change	Countries	Services	Margin
Panel a: Services				
MNE	7.38	0.63	2.36	4.24
non-MNE	-8.54	-0.60	1.80	-8.54
Foreign Owned	3.17	0.86	3.89	-1.53
Non-Foreign Owned	-8.64	-0.88	0.89	-8.64
Panel b: Goods				
MNE	-29.77	-1.28	2.44	-30.55
non-MNE	-25.04	-1.44	1.65	-25.19
Foreign Owned	-30.32	-2.04	4.53	-31.96
Non-Foreign Owned	-22.98	-1.27	0.99	-22.75

Note: This table presents the decomposition of the growth rate of Belgian exports between the first semester of 2008 and the first semester 2009 by ownership status of the firms.

Table 10: Change in the Margins of Belgian Exports (2008S1-2009S1) by Firm Characteristics

	Total	Extensive Margins		Intensive
	% Change	Countries	Services	Margin
Panel a: Services				
Big	-0.27	-0.38	2.60	-2.42
Small	-22.65	-1.13	-0.57	-21.32
Financially exposed	-1.32	0.25	0.97	-2.51
Financially non-exposed	-3.07	-0.74	3.20	-5.37
Panel b: Goods				
Big	-27.08	-1.85	2.85	-27.76
Small	-23.98	-0.48	1.28	-24.58
Financially exposed	-29.68	-1.94	1.84	-29.58
Financially non-exposed	-23.82	-0.90	3.36	-25.63

Note: This table presents the decomposition of the growth rate of Belgian exports between the first semester of 2008 and the first semester 2009 by size and debt structure of the firms (we define a firm as big if the number of full time equivalent employees is above the median and as financially exposed if the share of financial debts of the firm is above the median).

Table 11: Description of the Variables

Variable Name	Description	Source
Trade Variables:		
Export of Services	2007-2010 monthly exports of services by firm, service, country	NBB Trade in Services Dataset
Export of Goods	2007-2010 monthly exports of goods by firm, service, country	NBB Trade in Goods Dataset
Heterogeneity Channel:		
Size	Log of firm size, measured in terms of full-time equivalent employment	NBB Business Registry
Productivity	Log of Value added per worker	NBB Business Registry
FOR	Dummy indicating foreign ownership	NBB Survey of Foreign Direct Investments
MNE	Dummy indicating a multinational firm	NBB Survey of Foreign Direct Investments
Global Value Chain Channel:		
Share of Intermediates	Share of intermediates over turnover	NBB Business Registry
Share of Exports on Sales	Share of exports over turnover	NBB Business Registry
Share of Imports on Intermediates	Share of imports over intermediates	NBB Business Registry
Value Added Chain	Exports times imports over turnover	NBB Business Registry
Stocks Importance	Ratio of stock over turnover	NBB Business Registry
Credit Constraint Channel:		
External Financial Dependence	Investments minus operating profits over investments	NBB Business Registry
Share of Debts over Liabilities	Ratio of debts over total liabilities	NBB Business Registry
Share of Long-Term Debts	Share of debts due after one year	NBB Business Registry
Share of Financial Debts	Share of financial debt	NBB Business Registry
Demand Channel:		
GDP Growth	Average annual growth rate of GDP	IMF World Economic Outlook
Further Controls:		
Nace codes	NACE rev 1.1 2-digit industry dummies	NBB Crossroads Bank
OECD but non-EU	Dummy for countries belonging to the OECD (in 2008) but not to the EU	OECD and European Commission
non-OECD non-EU	Dummy for countries belonging neither to the OECD nor to the EU	OECD and European Commission
Exchange rate change	% change in the daily exchange rate with the euro between at the 1st of april of each year	European Central Bank

Note: All firm characteristics prefixed with a D are dummy variables that take value one if the firm characteristic is above the NACE rev 1.1 2-digit industry median across all trading firms (so both those trading services and those trading goods) and zero otherwise. All firm characteristics prefixed with a C indicate that we use the actual value of the variable.

Table 12: Looking for clues: regression on continuing firm-country-service triplets

Channels:	Goods		Services	
	β_1	β_2	β_1	β_2
Heterogeneity	0.0274^b	-0.0380^b	0.0154	-0.0175
	(0.013)	(0.015)	(0.067)	(0.096)
Global Value Chain	0.1259	-0.1641	-0.0909^b	0.2732^a
	(0.106)	(0.169)	(0.040)	(0.068)
Credit Constraints	0.0039	-0.0157	-0.0460	0.0505
	(0.010)	(0.014)	(0.046)	(0.075)
Demand	0.0101^c	0.0149^b	0.0202	-0.0135
	(0.005)	(0.007)	(0.018)	(0.025)
Constant	-0.0069		-0.2017	
	(0.046)		(0.123)	
Product/Service Dummies	Yes		Yes	
Industry Dummies	Yes		Yes	
Other Controls	Yes		Yes	
Observations	428,002		15,073	
Firms	30,802		9,362	
R^2	0.0097		0.0442	
Prob > F	0.0000		0.0000	

Note: This table presents the estimated coefficients for the different channels β_1 refers to the estimated effects in normal time and β_2 refers to the estimated effect of the same variables during the crisis. On the left side estimates for exports of goods and on the right for exports of services. Multi-level clustered standard errors in parentheses (at the firm, product and country level). [a] p<0.01, [b] p<0.05, [c] p<0.1.

Table 13: DD Regression on continuing firm-country-service triplets, continuous variables

	Goods		Services	
	β_1	β_2	β_1	β_2
Heterogeneity Channel				
Size	0.0260^a	-0.0187^c	-0.0000	-0.0000
	(0.008)	(0.011)	(0.000)	(0.000)
Productivity	0.0333^b	-0.0422^b	-0.0090	-0.0017
	(0.015)	(0.019)	(0.039)	(0.052)
Foreign Ownership Dummy	-0.0286	-0.0085	-0.0280	-0.0079
	(0.029)	(0.043)	(0.117)	(0.159)
Multinational Dummy	-0.0146	-0.0116	0.0496	-0.1949
	(0.027)	(0.041)	(0.091)	(0.161)
Global Value Chain Channel				
Share of Intermediates	0.0055	-0.0039	0.0171	-0.2233
	(0.005)	(0.006)	(0.187)	(0.289)
Share of Exports	-0.3424	-0.5167	-0.2919	0.5367
	(0.338)	(0.392)	(0.358)	(0.541)
Share of Imports	-0.5168	-0.1397	0.3992	-1.5467^b
	(0.365)	(0.583)	(0.376)	(0.717)
Valued Added Chain	0.0133	0.0011	-0.0035	0.0162^a
	(0.009)	(0.014)	(0.002)	(0.004)
Share of Stocks	0.0013	0.0336	-0.0582	0.1566
	(0.131)	(0.140)	(0.423)	(0.647)
Credit Constraint Channel				
External Financial Dependence	0.0000	0.0001	0.0000	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)
Share of Debts	-0.0195	-0.0429	-0.2010	0.2775
	(0.043)	(0.058)	(0.225)	(0.353)
Share of Long-Term Debts	0.0505	-0.0474	0.1781	-0.1919
	(0.043)	(0.064)	(0.216)	(0.379)
Share of Financial Debts	-0.0236	-0.0029	-0.2391	0.2993
	(0.038)	(0.046)	(0.181)	(0.323)
Demand Channel:				
GDP Growth	0.0095^c	0.0141^c	0.0152	-0.0098
	(0.005)	(0.008)	(0.017)	(0.026)
Constant		-0.0404		0.0655
		(0.145)		(0.371)
Service Dummies		Yes		Yes
Industry Dummies		Yes		Yes
Other Controls		Yes		Yes
Observations		319,161		14,080
R^2		0.0143		0.0566
Prob > F		0.0000		0.0000

Note: This table presents the estimated coefficients disaggregating the different channels into their components β_1 refers to the estimated effects in normal time and β_2 refers to the estimated effect of the same variables during the crisis. On the left side estimates for exports of goods and on the right for exports of services. Multi-level clustered standard errors in parentheses (at the firm, service or product and country level). ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.

Table 14: Correlations Between Independent Variables

							Exports of Goods									
Size	1.0000															
Productivity	-0.0170	1.0000														
Foreign Ownership	0.4913	0.2569	1.0000													
Multinational	0.5442	0.1449	0.4420	1.0000												
Share of Intermediates	-0.0279	0.0282	0.0004	-0.0048	1.0000											
Share of Exports	-0.1451	-0.0435	-0.0786	-0.0761	-0.0002	1.0000										
Share of Imports	-0.2670	0.0070	-0.1327	-0.1283	-0.0109	0.2514	1.0000									
Valued Added Chain	0.0075	0.0072	0.0080	0.0089	-0.0016	0.5981	0.1246	1.0000								
External Financial Dep.	0.0167	-0.0559	-0.0002	0.0194	-0.0002	-0.0004	-0.0043	0.0003	1.0000							
Share of Debts	-0.0658	-0.0917	-0.0486	-0.0508	0.0195	0.0372	0.0023	-0.0064	0.0013	1.0000						
Share of Long-Term Debts	0.0495	-0.0358	0.0070	0.1488	-0.0095	0.0003	-0.0215	0.0066	0.0267	0.1615	1.0000					
Share of Financial Debts	0.0715	-0.0412	-0.0828	0.1189	0.0073	-0.0082	-0.0373	0.0063	0.0082	0.2350	0.6122	1.0000				
OECD no EU Dummy	0.0043	-0.0042	0.0103	0.0091	-0.0093	0.0150	0.0248	-0.0008	0.0030	-0.0034	-0.0034	-0.0133	1.0000			
No OECD no EU Dummy	0.0335	0.0421	0.0411	0.0501	-0.0063	0.0081	0.0005	-0.0010	-0.0105	0.0004	-0.0112	-0.0291	-0.1567	1.0000		
Exchange Rate Changes	0.0204	0.0131	0.0173	0.0203	-0.0021	-0.0011	-0.0003	0.0003	0.0020	-0.0038	0.0059	0.0068	0.0004	-0.0106	1.0000	
Growth Rate GDP	0.0217	0.0212	0.0274	0.0332	-0.0036	0.0072	-0.0002	-0.0005	-0.0058	0.0066	-0.0101	-0.0182	-0.0623	0.4556	-0.0264	1.0000
							Exports of Services									
Size	1.0000															
Productivity	-0.0603	1.0000														
Foreign Ownership	0.4082	0.1685	1.0000													
Multinational	0.4599	0.1999	0.2835	1.0000												
Share of Intermediates	-0.1590	0.0350	-0.0682	-0.0042	1.0000											
Share of Exports	-0.1640	-0.0321	-0.1383	-0.1403	-0.0592	1.0000										
Share of Imports	-0.0264	0.0041	-0.0705	-0.0266	-0.1694	0.5877	1.0000									
Valued Added Chain	0.1722	0.2172	0.0776	0.2001	-0.0240	0.4253	0.3156	1.0000								
External Financial Dep.	0.0003	-0.0563	-0.0216	-0.0259	-0.0013	0.0116	0.0062	0.0065	1.0000							
Share of Debts	-0.2028	-0.1969	-0.2125	-0.1533	0.1392	0.0464	0.0590	-0.0921	-0.0030	1.0000						
Share of Long-Term Debts	0.1250	0.0778	0.0316	0.2661	-0.0501	-0.0491	-0.0758	0.0299	-0.0696	0.1507	1.0000					
Share of Financial Debts	0.1353	0.0559	0.0913	0.2590	-0.0341	-0.1346	-0.1399	-0.0866	-0.0364	0.2123	0.6582	1.0000				
OECD no EU Dummy	-0.0049	0.0081	0.0091	-0.0089	0.0107	0.0079	0.0016	-0.0119	-0.0021	0.0035	-0.0013	0.0060	1.0000			
No OECD no EU Dummy	0.0565	0.0528	-0.0367	0.0652	-0.0246	0.0846	0.0492	0.1390	0.0099	-0.0044	-0.0609	-0.1065	-0.2648	1.0000		
Exchange Rate Changes	-0.0042	0.0064	0.0074	0.0086	0.0064	-0.0080	-0.0087	-0.0103	0.0019	-0.0051	0.0061	0.0182	0.0008	-0.0258	1.0000	
Growth Rate GDP	0.0273	0.0327	-0.0084	0.0373	-0.0175	0.0503	0.0255	0.0799	0.0070	0.0041	-0.0299	-0.0525	-0.1095	0.5394	-0.0098	1.0000

Note: This table reports the correlations across our independent variables for both the services and goods specifications.

Table 15: Treated and Control Group Characteristics

	Control	Treated	Diff
log Size	2.983	3.091	-0.107
	(0.0445)	(0.046)	(0.064)
log Productivity	-2.302	-2.350	0.048
	(0.020)	(0.021)	(0.029)
log Capital Intensity	-3.952	-4.020	0.068
	(0.043)	(0.052)	(0.067)
log Average Wage	-2.867	-2.893	0.026
	(0.015)	(0.013)	(0.020)
MNE	0.052	0.055	-0.002
	(0.006)	(0.006)	(0.008)
FOR	0.130	0.132	-0.002
	(0.009)	(0.009)	(0.013)

Note: This table presents the characteristics and the differences of Control and Treated groups, in terms of size, productivity, capital intensity, average wage, multinational status and foreign ownership. In the last column there is the t statistic of a t-test where the null hypothesis is that the difference is equal to zero. [b] indicates significance of the difference at the 5% level.

Table 16: DDD Regression on continuing firm-countries, GDP Growth

Panel a: Bi-Exporters

	(1) All	(2) Durables	(3) Non-Durables	(4) Business Services	(5) Transport Services	(6) Services to Non Residents	(7) Telecomm. Services	(8) Construction Services	(9) Financial Services	(10) Other Services	(11) OECD	(12) non-OECD
$\gamma_3^{GDP\,Growth}$	-0.0549^b	-0.0802^b	-0.0444^c	-0.0950^b	-0.0627^a	-0.2549	0.0435	0.1314	0.0435	-0.0413	-0.1256^a	-0.0474
	(0.028)	(0.039)	(0.027)	(0.040)	(0.022)	(0.154)	(0.052)	(0.120)	(0.153)	(0.086)	(0.037)	(0.038)
Firm-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,846	9,459	11,471	7,183	6,228	481	768	660	1,065	1,735	9,902	6,513
R^2	0.0831	0.1013	0.0892	0.0782	0.1063	0.1823	0.1290	0.1239	0.1056	0.0968	0.0844	0.1150

Panel b: Matched Mono Exporters

	(1) All	(2) Durables	(3) Non-Durables	(4) Business Services	(5) Transport Services	(6) Services to Non Residents	(7) Telecomm. Services	(8) Construction Services	(9) Financial Services	(10) Other Services	(11) OECD	(12) non-OECD
$\gamma_3^{GDP\,Growth}$	-0.0466^a	-0.0560^b	-0.0334^b	-0.1087^c	-0.0480	0.2993^c	-0.6340^c	-0.0280	-0.0039	-0.0534^a	-0.0357^b	-0.0207
	(0.013)	(0.022)	(0.017)	(0.065)	(0.032)	(0.172)	(0.347)	(0.044)	(0.025)	(0.019)	(0.016)	(0.040)
Firm-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27,208	16,126	23,843	11,908	8,550	7,677	9,431	7,664	8,234	7,772	19,526	15,176
R^2	0.0717	0.0945	0.0857	0.0805	0.0767	0.1013	0.0588	0.0879	0.0506	0.1128	0.1131	0.1001

Note: This table reports the estimated coefficients for $\gamma_3^{GDP\,Growth}$ from equation for the firms that trade both goods and services (Bi-Exporters) and for the matched firms exporting either goods or services (Mono-Exporters). Clustered standard errors in parentheses (at the country level). ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.

Table 17: DDD Regression on continuing firm-countries, Credit Constraints

Panel a: Bi-Exporters

	(1) All	(2) Durables	(3) Non-Durables	(4) Business Services	(5) Transport Services	(6) Services to Non Residents	(7) Telecomm. Services	(8) Construction Services	(9) Financial Services	(10) Other Services	(11) OECD	(12) non-OECD
γ_3^{FIN}	0.4557	0.0938	0.2772	0.6000	0.1076	2.7639	-0.6523	1.2524	1.7447^b	0.5249	0.0108	0.3557^b
	(0.340)	(0.408)	(0.378)	(0.385)	(0.232)	(1.719)	(1.201)	(1.099)	(0.738)	(0.762)	(0.095)	(0.156)
Country-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,790	12,127	13,817	10,360	9,006	699	1,073	1,201	1,708	2,536	9,283	6,146
R^2	0.0313	0.0347	0.0327	0.0372	0.0597	0.2547	0.1940	0.1788	0.1834	0.1169	0.0119	0.0728

Panel b: Matched Mono Exporters

	(1) All	(2) Durables	(3) Non-Durables	(4) Business Services	(5) Transport Services	(6) Services to Non Residents	(7) Telecomm. Services	(8) Construction Services	(9) Financial Services	(10) Other Services	(11) OECD	(12) non-OECD
γ_3^{FIN}	0.0275	-0.0031	0.1837	-0.0190	0.1138	-4.1627	-0.0056	-0.7648	-0.2652	0.9249	-0.1162^b	0.0592
	(0.123)	(0.128)	(0.183)	(0.246)	(0.321)	(9.027)	(0.280)	(2.102)	(1.637)	(2.144)	(0.048)	(0.073)
Country-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	26,317	13,535	19,235	7,182	12,503	1,043	3,079	1,933	2,895	2,090	18,337	14,861
R^2	0.0331	0.0180	0.0413	0.0699	0.0644	0.3433	0.2400	0.2421	0.1614	0.1779	0.0038	0.0167

Note: This table reports the estimated coefficients for γ_3^{FIN} for the firms that trade both goods and services (Bi-Exporters) and for the matched firms exporting either goods or services (Mono-Exporters). Clustered standard errors in parentheses (at the firm level). ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.

Table 18: DDD Regression on continuing firm-countries, Heterogeneity

Panel a: Bi-Exporters

	(1) All	(2) Durables	(3) Non-Durables	(4) Business Services	(5) Transport Services	(6) Services to Non Residents	(7) Telecomm. Services	(8) Construction Services	(9) Financial Services	(10) Other Services	(11) OECD	(12) non-OECD
γ_3^{HET}	0.2086^b	0.0707	0.1513	0.1051	0.3923^a	1.0545	-0.2072	0.0527	0.2706	0.1378	0.2088^b	0.2108
	(0.098)	(0.143)	(0.119)	(0.088)	(0.076)	(0.649)	(0.229)	(0.317)	(0.215)	(0.243)	(0.106)	(0.188)
Country-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,442	9,166	11,105	6,007	6,957	400	761	647	1,056	1,696	9,533	6,310
R^2	0.0336	0.0352	0.0314	0.0569	0.0445	0.2710	0.1582	0.2072	0.1767	0.1165	0.0130	0.0689

Panel b: Matched Mono Exporters

	(1) All	(2) Durables	(3) Non-Durables	(4) Business Services	(5) Transport Services	(6) Services to Non Residents	(7) Telecomm. Services	(8) Construction Services	(9) Financial Services	(10) Other Services	(11) OECD	(12) non-OECD
γ_3^{HET}	0.0109	0.0708	0.0177	0.0190	0.2207^b	-1.2548	-0.0118	1.0219^a	0.1214	-0.0252	0.0177	0.0411
	(0.053)	(0.113)	(0.054)	(0.267)	(0.110)	(2.024)	(0.113)	(0.270)	(0.133)	(0.589)	(0.054)	(0.051)
Country-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27,830	16,630	24,414	8,646	12,113	7,730	9,762	7,717	8,317	7,825	24,414	19,526
R^2	0.0244	0.0280	0.0253	0.0663	0.0467	0.0656	0.0728	0.0651	0.0693	0.0630	0.0253	0.0027

Note: This table reports the estimated coefficients for γ_3^{HET} for the firms that trade both goods and services (Bi-Exporters) and for the matched firms exporting either goods or services (Mono-Exporters). Clustered standard errors in parentheses (at the firm level). ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.

Table 19: DDD Regression on continuing firm-countries, Global Value Chain

Panel a: Bi-Exporters

	(1) All	(2) Durables	(3) Non-Durables	(4) Business Services	(5) Transport Services	(6) Services to Non Residents	(7) Telecomm. Services	(8) Construction Services	(9) Financial Services	(10) Other Services	(11) OECD	(12) non-OECD
γ_3^{GVC}	-0.0368	0.3495	-0.0177	0.0437	-0.0841	0.4672^c	-3.6562^c	-0.0898	1.1074	0.3360^b	-0.0256	-0.1321
	(0.148)	(0.345)	(0.137)	(0.147)	(0.128)	(0.244)	(2.103)	(0.722)	(0.669)	(0.167)	(0.136)	(0.117)
Country-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,752	7,589	9,535	6,272	5,227	362	642	529	1,019	1,628	8,178	5,889
R^2	0.0385	0.0415	0.0354	0.0452	0.0682	0.2791	0.1810	0.2145	0.1985	0.1129	0.0142	0.0768

Panel b: Matched Mono Exporters

	(1) All	(2) Durables	(3) Non-Durables	(4) Business Services	(5) Transport Services	(6) Services to Non Residents	(7) Telecomm. Services	(8) Construction Services	(9) Financial Services	(10) Other Services	(11) OECD	(12) non-OECD
γ_3^{GVC}	0.1944	0.0599	0.2761	-0.2293	-0.7629	3.4930	-0.0001	-3.1039^a	-0.1304	-0.7269	-0.6171^a	-0.3515^a
	(0.190)	(0.474)	(0.209)	(0.263)	(0.516)	(26.024)	(0.267)	(0.824)	(0.319)	(1.622)	(0.162)	(0.112)
Country-Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,363	7,502	15,087	8,006	7,410	7,254	9,178	7,260	7,348	7,313	12,879	12,597
R^2	0.0367	0.0562	0.0403	0.0654	0.0649	0.0650	0.0779	0.0647	0.0647	0.0657	0.0080	0.0211

Note: This table reports the estimated coefficients for γ_3^{GVC} tfor the firms that trade both goods and services (Bi-Exporters) and for the matched firms exporting either goods or services (Mono-Exporters). Clustered standard errors in parentheses (at the firm level). ^{a} p<0.01, ^{b} p<0.05, ^{c} p<0.1.