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Service characteristics and the choice between exports and FDI: Evidence from Belgian firms

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Abstract

The decision to serve foreign markets through exports or foreign direct investment (FDI) has been studied within proximity-concentration models of location, mainly in the context of trade in goods. This paper adapts these models to account for the specific nature of services that are traded across borders. We show how services can be characterized by a bundle of attributes that collectively describe the service. These attributes are then tested to show how they affect the choice between exports and FDI using service-level data for firms in Belgium selling services abroad. Three different types of characteristic are shown to affect the export versus FDI decision: intangibility, the search-experience-credence framework and the requirement for either the supplier or the client to physically move to the point of production.

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1. Introduction

The choice between serving markets either through exports or through setting up a local subsidiary via foreign direct investment (FDI) has been studied more thoroughly for manufacturing than for services. There is a need for more work on the choice of how to serve foreign markets for services in particular because it is believed that that this choice is more constrained by the nature of services than for goods. Internationalisation of services mainly occurs by setting up foreign affiliates in other countries through foreign direct investment (FDI) and less by exports (Smith, 2015). By 2015 about two thirds of global FDI stock was concentrated in the services sector up from just under 60% in 2001 (UNCTAD, 2011 & 2017). This compares to a share of 22.4 % for services in the world's trade in goods and services in 2018 (Eurostat, 2019).

To what extent is the choice of exports versus FDI influenced by the number of firms willing to export services or from greater convenience in supplying services through a local presence? Compared to firms that set up affiliates abroad to provide services, are exporters more numerous but smaller? Is the choice between cross-border trade and sales of foreign affiliates mainly a question of which industry the provider is in? Do the inherent characteristics of services limit the potential of firms to export directly? These are some of the questions that this paper sets out to address.

The paper starts from the proposition that decisions about how best to serve a market are taken at the level of the firm. Therefore, we provide insights on reasons for the low level of cross-border trade in services by taking a supplier perspective. This is in line with the current trade literature on heterogeneous firms and their decision whether or not to internationalise (Ariu et al., 2018). However, if it is firms not countries or industries that trade it is also the case that it is goods and services that are traded, not firms. Therefore, the emphasis shifts in our paper from the firm to the service that is traded.

The paper contributes to the literature in three ways. First it covers even the smallest firms that are usually excluded from data sets on trade. It shows that there are many more firms trading services than was hitherto expected. Second it emphasises the importance of looking beyond the firm trading services to the service itself. Third it examines what aspects of the service itself can be said to influence the choice of exports versus FDI between direct exports and sales through a foreign affiliate.

The next section reviews the relevant literature on the internationalisation of service firms and the choice between exports and FDI. Section 3 presents the data set used for the empirical part. Section 4 presents the characteristics of Belgian firms active on the international market, putting particular emphasis on size of firms as well as the industry in which they are active. Section 5 looks at the choice between the modes of internationalisation as a function of firm and service characteristics. Section 6 concludes.

2. Literature Review

FDI in services can be seen as proceeding through a series of waves (Kundu and Merchant, 2008). A first wave between 1960 and 1980 saw professional and financial service firms following their manufacturing clients abroad. A second wave from 1980 to 1990 witnessed the internationalisation of previously domestic service firms in certain sectors, such as telecommunications, seeking to expand abroad to compensate for lower growth possibilities at home. A third wave from 1990 to the present has been driven by liberalisation, market opening and privatisation creating new opportunities for FDI in services previously closed to competition. In Europe the fall of the Berlin wall and opening up of central and eastern European countries both prior and post-EU enlargement led to large investments in areas such as financial services and distribution.

The decision to invest in another country is most often preceded by exports to the country (Conconi, Sapir & Zanardi, 2016). Hence, firms that export and/or invest abroad concern most often the same firms, but observed at a different stage of their development. The firms involved in such an internationalisation process are small in number but heterogeneous in origin and performance. This raises the question: who are these firms, and are there differences between firms that trade goods versus those that trade services (Ariu, 2012)?

Beginning with the realisation that trade is performed by firms rather by countries or industries, a large literature developed based on firm level data to answer the question "Who trades" (Wagner, 2016). Studies later expanded to cover also imports. This literature gave rise to a number of stylised facts. Originally applied to exports of goods, a number of papers sought to test whether these stylised facts also apply to services (Borchenius et al., 2010; Malchow-Møller et al., 2015; Gaulier et al., 2010; Gourlay et al., 2005; Eikelpasch & Vogel, 2011; Breinlich & Criscuolo, 2011; Ariu, 2012; Lööf; 2010; Conti et al., 2010, Minondo, 2014). A comparative study of four European countries found that to a large degree findings from firms that trade goods also apply to services (Damijan et al., 2015). As would be expected from the aggregate trade data, firms for which services are the principal activity are relatively less likely to engage in trade than manufacturing firms. Most trading firms are engaged in both imports and exports. Similar to firms trading goods, firms trading services pay higher wages and have higher productivity than non-trading firms. Melitz (2003) sought to provide a theoretical underpinning for the observed regularities in terms of heterogeneous firms that select into trade according to their levels of productivity, emphasising the intra-industry aspects of trade rather than the previously dominant sector specific approaches. This theory is also widely accepted as applicable to services.

Exporting firms use more highly educated labour than non-exporting firms. The existence of a wage premium may therefore reflect differences in the composition of the labour force. Individuals with higher education levels may self-select into exporting firms, which are themselves higher performing than non-exporters (Munch & Skaksen,

2008). In order for human capital to play an autonomous role in exporting there must be some spill overs from individual skill sets to the firm as a whole. Based on an analysis of how wages of otherwise similar individuals depend on the export intensities and share of highly educated in otherwise similar firms, Munch and Skaksen (2008) find that there is only a wage premium from exporting in firms where the skill intensity is sufficiently high and that the size of the export premium is increasing in the skill intensity of the firm.

In a study of 25 countries trading services, Contractor and Mudambi (2008) found that human capital variables fit slightly better for goods exports than for service exports in spite of the expectation that the quality of human capital would be more important for service exports. Irrespective of whether there is a major difference in the importance of human capital between exporters of goods and those of services, human capital does seem to play an important role in the performance of exporters independently of self-selection into exporting firms.

Recent empirical studies on trade have moved away from the previous firm focused literature to one that is more focused on what is being traded with whom using individual records of transactions. The move to the "what" as opposed to the "who" opens the way to an approach to services that is more focused on the content of trade based on the characteristics of the actual service that is traded and also to approaches based on tasks involved in trading services. As summarised by Wagner (2016), the literature on transactions has given rise to a number of stylised facts. Exports and imports are dominated by "superstars" trading many goods with many countries. Most firms trade a small number of goods with a small number of countries. Changes from year to year are dominated by the individual amounts traded rather than by entry and exit. Productivity is not only positively related to export participation but also to the number of goods exported and the number of destination countries. The number of export destinations and exported products increases with age. Finally, firms that export many products export to many countries and more of a given product to a given destination.

Moving from the "who" and the "what" of trade, increasing attention is devoted to the "how" question. For services, this question is more complicated to study than for goods. The General Agreement on Trade in Services (GATS) distinguishes four different modes by which services are traded internationally using a terminology that has become widely accepted. Cross-border trade in services takes place through the supplier moving temporarily to the user (mode 4 under the GATS) or the user moving temporarily to the supplier (mode 2 under the GATS) as well as when the service is supplied cross border without any physical movement of persons as is the case for goods (mode 1 under the GATS). Somewhat confusingly, FDI is covered by mode 3 under the GATS. In this paper we study FDI (mode 3) versus exports of services without any physical movement of persons (mode 1) and where the supplier moves temporarily to the user (mode 4) and only to a lesser extent on the user moving temporarily to the supplier (mode 2) as forms of cross-border trade.

The international economics literature dealing with the choice between FDI and exports extends the Melitz (2003) literature to explain FDI from the interplay between firm heterogeneity, the fixed cost of FDI and the transportation cost of exporting (Helpman, Melitz & Yeaple, 2004). When firm productivity is high enough, paying the fixed cost of FDI to avoid transportation costs is preferable to exporting. Under this model, while the productivity of exporters is higher than that of non-exporters, that of firms that engage in FDI is higher still. The model has been tested empirically and generally found to work well for goods. A key difference between goods and services relates to transport costs. Certain services, those that can be provided over the internet, entail no transport costs. For services that require the simultaneous presence of both supplier and user, the transport cost involved is that of the provider (user) and not of the service itself.

A number of studies apply the Helpman, Melitz & Yeaple model to services. These studies find that firms that engage in FDI are larger than those that only export services (Temouri, Driffield & Higon, 2010; Federico & Tosti, 2012; Castellacci, 2014; Wagner, 2014). FDI in services is also positively related to age (Bhattacharya et al., 2012), the level of skills (Oldenski, 2012; Kelle et al., 2013; Bhattacharya et al., 2012) and being the affiliate of a foreign multi-national (Ariu & Mion, 2017; Walter & Dell'mour, 2010). Walter & Dell'mour (2010) also look at the relationship between service imports and goods exports and FDI and find complementarity between the two, while Kelle et al. (2013) find that the effect of a common border is to stimulate exports of services rather than FDI.

Most of the studies on FDI in services find a positive effect of productivity on the choice of FDI over exports in line with the Helpman, Melitz & Yeaple model (Temouri, Driffield & Higon, 2010; Federico & Tosti, 2012; Castellacci,2014; Ariu & Mion, 2017). However, Bhattacharya et al (2012) use the Indian software industry to test whether the standard framework applies in the absence of transport costs, while Wagner (2014) does the same for German computer, research and development and professional services. Both studies find that firms that internationalise through permanent presence are less rather than more productive than those that export directly. They explain this discrepancy in terms of the impossibility of testing the quality of a service prior to purchase. In that case purchasing from a local supplier is perceived as less risky than purchasing from abroad. Only the firms with the highest reputations will be able to export successfully, so that unlike for goods the threshold of productivity for exporting services is higher than for FDI.

Service characteristics

Whether or not the choice of serving international markets through a foreign affiliate rather than through cross-border trade is constrained by the nature of services represents a crucial issue that has not been fully resolved in the extant literature. The belief that services are in some sense un-tradable remains very widespread. When the definition of exports and imports of services is widened to include temporary presence of either the supplier or user, it becomes clear that all commercial services and many social services such as health and education can be traded cross-border. It is then a commercial decision on the part of the firm which form of internationalisation to choose depending on the relative costs and benefits of each strategy which determines the choice.

Inseparability of production and consumption has led to a distinction between hard and soft services (Erramilli, 1990). For hard services, production is separable from consumption while in the case of soft services it is not thus requiring the simultaneous presence of the provider and the user for consumption to occur. It should be obvious that hard services pose no particular problem for cross-border trade and indeed are heavily traded. Transport services and trade finance that are inseparable from trade in goods are services that have been traded cross-border from the earliest times.

Soft services that rely heavily on client interaction and customisation can be divided into two types: location-intensive and information-intensive (Ball, Lindsay & Rose, 2008). Location-intensive soft services include retailing, fast food and vehicle rentals. Generally, the user moves to the producer to consume these services cross-border as part of travel for business or pleasure (e-commerce is an exception for retailing). Information-intensive soft services cover most professional services such as management consultancy, legal, marketing and technical services and IT solutions. They require that the two parties exchange complex information in order to define customers' needs and develop individualised solutions.

It used to be considered that the extensive customisation required for information-intensive soft services led to resource intensive modes of supplying foreign markets, particularly subsidiaries or joint-ventures. This is particularly problematic for smaller firms and do not fit well with the individual project basis of many professional services rather than on-going commercial relations with the same clients. However, as developed by Ball et al. (2008) in their value chain approach to service provision, the periods in which intensive provider-client interaction is required are generally concentrated at the beginning and end of the project and can be quite short. The production phase can be undertaken at the location of the provider. This implies that temporary presence of the supplier during these critical phases is both feasible and sufficient to provide such information-intensive soft services cross-border. That professional services are one of the fastest growing types of service exports would appear to support the validity of the model.

The task approach to service trade can be considered complementary to the firm and transaction level ones. Here the emphasis is on how a service is produced rather than by whom or what is traded. Task classifications typically begin with occupations and then break down what tasks are performed by each occupation. For example, in the German QCS data set used by Arau and Mion (2017), tasks are classified as analytical, interactive, routine cognitive and routine manual and non-routine manual. While IT is widely considered as contributing to growing cross-border trade in services, a tension between the rise in interactive tasks and the need for some sort of proximity in the provision of services breaks a simple relationship between IT diffusion and the number of service trading firms so that the change in IT use does not translate into differences in the export participation of firms. Complexity and need for personal communication act in different directions. In industries in which face to face communication became more important, Ariu et al. (2017) find that firms experienced a lower propensity to engage in exports as opposed to FDI. Instead, where cognitive tasks have increased, there is a higher likelihood of seeing new exporters. They also find that in industries in which there has been a more important increase in the number of foreign affiliates there has a been a higher likelihood of leaving export markets.

The transmission of information as a decision factor for the mode of delivering services to foreign customers is also central in the work of Oldenski (2012). In the model she develops and tests against US data, information can be communicated either within a firm during the process of production or from the firm to an outside customer during delivery or sales. The relative importance of the two types of communication then determines whether a firm will serve a given foreign market through exports or affiliate sales. A preponderance of within firm communication would lead to an export led strategy while a preponderance of outside communication would lead to a strategy based on foreign affiliates. From evidence on the international operations of US firms, Oldenski finds that the level of complexity of production has an offsetting effect to that of communication with customers. According to her, it is because services require much more interaction with customers than manufactures that can explain much of the difference between export to FDI ratios in the two cases.

In this paper we develop a comprehensive framework based on consumer behaviour theory to investigate how different service characteristics affect the choice between exporting and FDI. We show how the combination of these characteristics of services with firm characteristics determine the choice between export and FDI. The relevance of distinguishing between the different characteristics is tested using product-level data in combination with firm level data for firms in Belgium selling services abroad.

3. Data

Testing theories of how heterogeneous firms decide to internationalise and choose between exporting and supplying foreign markets through sales of foreign subsidiaries is very challenging from the data point of view. The point of departure requires firm rather than industry level data. Comprehensive data on firms is not as widespread for

services as for manufacturing. Export data for services comes from the balance of payments series. Even at national level it is much weaker for services than for manufacturing with relatively little breakdown confined to values. For a long time, data on FDI was limited to stocks and annual flows. Information of sales of foreign affiliates comes from the so-called FATS (Foreign Affiliates Trade in Services) data. Looking at the choice between exports and FDI at firm level therefore requires integrated data from the balance sheet and profit and loss accounts, for exports of services at firm level as well as data for the sales of foreign subsidiaries. Such coordinated data sets are very rare.

This paper uses micro data sets on non-financial commercial services held by the National Bank of Belgium which are linked together via the *Crossroads* Bank for Enterprises. The Belgian data for trade in services does not cover important sectors such as distribution, for which the relevant trade category is merchanting, and hotels and catering (HORECA) for which the relevant trade category will usually be travel (Annexe Table 1). With these limitations, the Belgian micro data sets contain all the necessary data covering all firms in Belgium that are incorporated, including those with zero employees. Many zero employee businesses choose to incorporate for fiscal or other reasons under a variety of legal forms that are well adapted to their needs. Non-incorporated firms are excluded. Unfortunately, these data sets are only available for the period 1997 to 2005.

In order to incorporate service characteristics in the empirical analysis of the choice between exports and FDI these characteristics must be measured for the different types of services that are traded. For the purposes of this paper it was necessary to create a unique set of data on service characteristics that could be matched with the data on exports of services. This data set constitutes in itself an important contribution.

4. Size and age of firms that export and invest abroad services

Only a small number of Belgian firms engage in cross-border trade and this is particularly true for services where there are less such firms than for goods in spite of there being many more service firms. In 2005, the last year for which there is data, 235,258 firms had no overseas sales of services, 9,341 exported services and 202 Belgian firms had sales of services through foreign affiliates. Economies of scale play less of a role for services than for manufacturing, particularly for knowledge intensive business services. Information technologies also have the potential to lessen the cost and the need for proximity to clients for service providers wishing to sell cross border. As a result, the impact of size plays differently for trade in services. In particular small and micro enterprises can profitably engage in exporting and even in setting up local subsidiaries abroad. Restricting the analysis of trade in services to firms with more than twenty employees, as is common for manufacturing, risks excluding a potentially significant part of the population of firms that engage in trade in services. Fortunately, the very comprehensive nature of the data held by the National Bank of Belgium allows us to explore the role of small and micro firms in service trade.

Service firms with less than 20 employees represent nearly three quarters of service exporters and a quarter of service exports (Table 1). The very large numbers of small and micro enterprises that export services illustrates the importance of including them in the analysis even though their share in the overall value of trade is small. Among these firms there may be a number with potential to subsequently grow and contribute substantially to overall growth in the economy. The large numbers of firms that export services further shows that the low share of exports in total trade cannot be attributed to non-participation.

Of particular interest are the previously neglected category of firms with zero employees which represent 17% of exporters and account for nearly 9% of exports. These are firms that are active on the market with turnover and value added even if they have no employees. They are not "shell" firms. Service exporters without employees are concentrated in high value added professional and technical services where they are able to take advantage of information technologies to provide specialised skills that are in demand abroad. Since little is known about this particular category of firms, further investigation would be warranted.

For firms with 20 or more employees the usual relationship between size and exports holds with declining shares in the number of firms exporting and rising shares in the value of exports of services. The largest group of 250 employees and over accounts for 32% of exports and those between 50 and 249 employees a quarter of exports, or the same share as firms of less than twenty employees. We observe relatively low shares in exports for the categories of firms with 10-19 and 20-49 employees, which may indicate a difficulty for Belgian enterprises to grow sufficiently large through internationalisation.

For reasons of confidentiality, the statistics on Belgian firms with foreign affiliates is more aggregated. Small firms dominate the number of Belgian firms with foreign subsidiaries and account for a similar share of sales of foreign subsidiaries unlike the case for exports of services. The specific Belgian form of coordination centres, which are essentially foreign firms that act as holding companies for fiscal reasons may be playing a role here. While large firms of 250 employees and over only represent 17% of firms with subsidiaries, they account for the same share of sales as small firms.

Table 1 Share of exporters, exports, firms with service foreign affiliates and sales of foreign affiliates by size (1997-2005)

Size Categories	Share Exporters	Share Exports	Share Firms with Foreign Subsidiaries	Share Sales of Foreign Subsidiaries
0 employees	17.26%	8.50%		
1-9 employees	34.07%	9.70%		
10-19 employees	13.91%	7.60%		
0-19 employees	*65.24%*	*25.80%*	*42.60%*	*40.40%*
20-49 employees	17.78%	17.20%	14.50%	5.70%
50-249 employees	12.92%	25.40%	25.90%	13.20%
250+ employees	4.05%	31.60%	17%	40.70%
Total	100.00%	100.00%	100.00%	100.00%

Three quarters of exporters are less than twenty years old accounting for 56% of exports of services. Those over 50 years old only represent 3% of exporters but 13% of exports. Among the firms with less than twenty employees, the category of 10-20 years old are the most numerous representing 30% of all exporters and 27% of exports. The age structure of Belgian firms with foreign affiliates is bimodal with high shares of both firms and sales of foreign affiliates for the youngest firms of less than 20 years old (respectively 53% and 44%). Although less numerous, older firms of over 50 years old (11% of firms with foreign affiliates) also account for a high share of sales (32%).

Overall exports represent 44% of total trade and sales of foreign affiliates 56% so the two are quite balanced (Table 2). We observe a high share of sales of foreign affiliates in total trade of two thirds by the smallest firms of less than twenty employees. Holding companies and co-ordination centres would seem to play a role here, particularly because two-thirds of all exporters are in these size categories. Medium size firms export more than they sell through overseas affiliates. For the oldest firms, sales through a local presence is the preferred form of internationalisation.

Table 2 Share of sales of foreign affiliates in total trade in services by size (1997-2005)

Size Classes	0-19 employees	20-49 employees	50-249 employees	250+ employees	All firms
Shares	66.50%	29.50%	39.60%	61.90%	55.80%

Trade in services by Belgian firms during the period covered by this data was heavily concentrated within the then European Economic Area[1] (EEA) with 74% of exports and 96% of sales of foreign affiliates going to those countries.

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[1] The EU-15 plus Norway and Iceland. Ten New Member States joined the EU in 2004 but their share in total trade was very low.

Sectoral differences

Many firms trade services outside their principal activity, including for instance many manufacturing firms. Equally, service firms, particularly those in distribution, are major traders of goods. **For that reason, in the empirical part of the paper we cover all firms that trade services irrespective of their industry of origin and do not restrict ourselves to firms whose principal activity is in services.** Table 3 looks at the breakdown by sector of activity of firms as they trade services cross-border.

Two sectors, transport and professional, scientific and technical services, account for half of all exporters and over two thirds of exports. Small countries need to specialise, also for services, and Belgian patterns of specialisation reflect traditional comparative advantage in the case of transport and successful reorientation towards the knowledge economy in the case of knowledge intensive business services (KIBS). These two sectors dominate the smallest size categories, in particular professional, scientific and technical services for the zero-employee category. These will be mainly sole proprietorships and partnerships offering very high valued services. Goods producing sectors (including agriculture and extractive industries as well as manufacturing) and distribution are also major exporters of the services represented in the data even though they are not part of their main area of activity. Not only very small firms but also firms outside services need therefore to be included in the analysis of cross-border trade in services.

Generally, services which have a higher share of foreign subsidiaries than exporters also have higher shares of sales of these subsidiaries than exports. Professional services constitute an interesting exception. The share of exporters is higher than that of exports, indicating that professional services are mainly the smaller exporters. However, the share of foreign subsidiaries is lower than that of exporters but the share of sales of foreign subsidiaries is higher than that of both exporters and foreign subsidiaries, indicating that fewer professional service firms internationalise via FDI but when they do, they are substantial players. Hence, there are many small direct exporters and a few major multinationals.

Table 3 Export and FDI of Services by Sector of Activity (1997-2005)

Industry	Share Exporters	Share Exports	Share Foreign Subsidiaries	Share Sales of Foreign Subsidiaries
goods	13.8%	9.6%	21.5%	19.6%
utilities	0.1%	0.8%	1.1%	16.3%
construction	7.7%	4.4%	7.7%	3.4%
distribution	11.0%	5.5%	6.3%	5.0%
HORECA	0.4%	0.1%	0.7%	1.5%
transport	25.7%	46.8%	16.4%	7.8%
communications	7.7%	10.4%	9.2%	5.2%
real estate	1.6%	0.2%	8.2%	8.7%
leasing	1.5%	0.9%	3.5%	4.4%
R & D	0.5%	0.8%	0.0%	0.0%
professional services	22.6%	18.1%	19.6%	25.6%
administrative services	4.2%	1.5%	3.6%	1.8%
waste management	0.3%	0.1%	1.5%	0.3%
audio-visual services	2.7%	1.0%	0.7%	0.3%
household services	0.2%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%

FDI represents an important form of internationalisation for services which is practised by a relatively small number of firms. Goods producing firms also trade services and need to be included in the set of firms covered in the empirical part. In the next section the attention shifts from the firm to the service traded.

5. FDI versus exports

5.1. Modelling the FDI versus export choice for services

The objective of this paper is to arrive at a better understanding of the choice between exports and FDI in services. For this purpose, we develop a hierarchical model where firms first make the choice of selling services abroad and next decide how to best serve the foreign buyers through exports and/or selling locally through a foreign affiliate. The first stage of this hierarchical decision process – to internationalize or not -will not be modelled as this has already received due attention in earlier work (Borchenius et al., 2010; Malchow-Møller et al., 2015; Gaulier et al., 2010; Gourlay et al., 2005; Eikelpasch & Vogel, 2011; Breinlich & Criscuolo, 2011; Ariu, 2012; Lööf; 2010; Conti

et al., 2010, Minondo, 2014, Damijan et al., 2015). The second stage is understudied (exceptions are Temouri, Driffield & Higon, 2010; Federico & Tosti, 2012; Castellacci, 2014; Wagner, 2014). In most cases the second stage decision : the choice between exports and FDI follows a sequential process where firms first start exporting to the foreign market and after some time and sales volume they set up foreign affiliates and start making sales through them, similar to goods (Conconi, Sapir & Zanardi, 2016). However, for most of the services substitution will only be partial and (some) complementarity cannot be excluded. Hence, the choice does not correspond to a dichotomous process where exports are completely substituted by FDI. Moreover, the decision to export or sell abroad tend to be different for each service the firm sells abroad.

To model these different realities, we need a flexible specification allowing for zero FDI, a combination of FDI and exports, and zero exports for each service that the firm sells abroad. While we could have used the Fractional Response model (Woolridge, 2010), the Tobit model is preferred as our data are two way censored and contain many zeros (zero FDI), as well as ones (zero exports). As demonstrated in Tobin's (1958) original paper, the Tobit is a valid regression strategy for investigating so-called "corner solution responses" – responses that are non-negative with a roughly continuous distribution over the positive values, but that also take on values at the corners (Wulf et al.2020). The zeros reflect the reality that many firms have chosen only exports as exclusive internationalization mode. Thus, the zeros are an outcome of the second stage decision framework which we need to model. The Tobit model is able to estimate both a firm's decision of whether or not (=0) to set up a foreign affiliate and, if such expansion had already taken place, the degree it uses the foreign affiliate to make foreign sales as outcome variables, in the extreme case without exporting (=1).

It is important to note here that the unit of analysis is not the firm but the service sold by the firm. Firms enter the data with the different services they sell abroad. Hence, the Tobit model estimates for each service-firm-year combination the no-FDI regime as well as the FDI sales intensity regime.

The specification of the model we propose follows the proximity-concentration model developed by Helpman, Melitz & Yeaple (2004), but adapts it for services. Under their model heterogeneous firms trade off the costs of exporting and the costs of FDI when deciding how to serve foreign markets. Our model replaces the emphasis of the goods model on the desire to avoid transportation costs as a driver of the export versus FDI decision with the more general concept of transaction costs. Service characteristics affect transaction costs through a number of channels stemming largely from information and communication costs rather than the cost of delivery.

We extend the basic model beyond the usual firm specific factors to include also service specific determinants as a set of characteristics which together describe different facets of a service. Service characteristics impact the choice between exporting and FDI in a number of different ways. They can make it more or less difficult for the customer to comprehensively describe and envisage what the service is on offer

prior to purchase. Standardised services in particular are more amenable to price comparisons both domestically and internationally. Services for which it is difficult to assess quality prior to purchase increase the riskiness of purchase. Buying from a supplier overseas is inherently more risky than purchasing from a locally established supplier where reputation and word-of-mouth can play a bigger role in judging the value of a service offering. Because of their importance and the difficulty of measuring service characteristics in an objective manner, the box section details how the paper deals with them empirically.

Each firm will decide for each of its services whether it is worthwhile to serve foreign markets in addition to the domestic one and, if so, whether by exporting or through sales of foreign affiliates. In line with the arguments developed in section 2, the profitability of choosing for FDI versus exporting can be expressed as a function of the firm specific determinants previously identified in the literature and service characteristics, the focal variables of our analysis.

In the corresponding equation for empirical estimation which we propose below, the dependent variable y_{ikt} expresses the outcome of the choice by dividing the sales of foreign affiliates (FDI) of service k of firm i in year t by total foreign sales including export sales of service k by firm i in year t. The dependent variable varies between zero and 1. Since most firms do not invest abroad for all of its services or only invest later after having reached a sufficient level of foreign sales, the variable equals zero at the time of measurement for these firms. For firms which exclusively sell abroad through their foreign affiliates the value becomes one.

Measuring Shares of Foreign Direct Investment

Calculating shares of sales of foreign subsidiaries in total trade requires combining data on exports of services with data on foreign investment. In order to match sales of foreign subsidiaries with exports of the parent firm, we use NACE codes matched to the EBOPS classification of trade in services via the Central Product Classification (CPC) with the help of concordance tables from Eurostat. Turnover of the subsidiary is then aggregated to a level equivalent to the breakdown of exports under the trade in services data. Exports and turnover of foreign subsidiaries are then added to form the denominator in the calculation of shares of sales of foreign affiliates in total trade. It is important to emphasise that a firm may have multiple observations for the same year for both exports and sales of foreign subsidiaries. For exports this implies that it will be exporting more than one service and for FDI that a firm has subsidiaries whose main activity are categorised as different activities. In the empirical part of the paper, the unit of observation is the individual service traded.

To account for the two ways in which services may be traded, we use a two-way censored Tobit model, which expresses this two-regime behaviour by means of a latent variable y_{ikt}^*. Since there is a great deal of persistence in a firm's trade participation in trade from one year to another, standard errors are clustered at the level of the firm.

$$y_{ikt}^* = X_{ikt}\beta + \varepsilon_{ikt}$$

$$y_{ikt} = 0 \; if \; y_{ikt}^* \leq 0$$

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$$y_{ikt} = y_{ikt}^* \ if \ y_{ikt}^* > 0 \le 1$$

$$y_{ikt} = 1 \ if \ y_{ikt}^* \ge 1$$

$$\varepsilon_{ikt \sim i.i.d. \ N(0,\sigma^2)}$$

The vector X_{ikt} of explanatory variables can be partitioned in two sub-vectors of firm related variables and service specific related variables. Industry of parent company[2] and year fixed effects are added to control for systematic differences between industries and variations in the business cycle. Below we specify which determinants at the firm and product level govern the choice between exports and FDI. The corresponding variables that are entered in the empirical model are denoted in italics.

Firm related variables ensure that the basic findings of the proximity-concentration model are properly controlled for. Size measured by turnover (*log turnover*) has been found to be positively related to FDI over exports picking up scale effects. Number of years since the creation of the firm (*log age*) is also expected to be positively related to the choice of FDI picking up experience effects. If the firm is situated immediately adjacent to an internal border (*border*)[3] and if the firm also imports services (*service imports*) should promote exports over FDI. A firm that also exports goods (*goods exports*) or if the parent firm is also an affiliate of a foreign multinational (Inward FDI) are expected to promote FDI over exports. The last four variables are entered as indicator variables which take the value of one if the variable applies to the firm in question and zero otherwise.

Productivity (*log productivity*) is the key determinant in the proximity-concentration model to explain the firm's success in foreign markets and the scale of its operation. That model is built around productivity differences between firms that export and those that engage in FDI. It is equally applicable to zero employee firms and it would have been desirable to be able to include them in the empirical part of the paper. As our measure of productivity, we had to make recourse to apparent labour productivity proxied by value added divided by the number of full-time equivalent employees. Unfortunately, because the NBB data set does not include information on the numbers of self-employed we are not able to measure productivity for zero employee firms and they have to be excluded from the empirical part of the paper.

As reported in the literature review, some authors have found that for certain services (software and professional services) the relationship between the productivity of firms

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[2] Industry of the parent company in Belgium should be distinguished from the industry of the subsidiary in a foreign country, which may not be the same, and from the services that are traded. Broad activity categories are used as industry indicators to control for major differences in technology and other industry specific factors.

[3] Half of the population of Belgium and a similar share of firms based on their headquarters are located in an area immediately adjacent to an internal border (for instance Antwerp and Liege but not Brussels or Ghent). Firms situated in a border region have the possibility to supply local markets across the border by exports. They are also more likely to have knowledge of local customs and the ability to speak the language of the neighbouring country.

with foreign subsidiaries is lower than that for exporters (Bhattacharyaet al., 2012; Wagner, 2014). With a data set that covers a large spectrum of B2B services, we are able to test empirically whether the standard framework works generally for services. In 2005, apparent labour productivity for service exporters was 42% higher than that for domestic firms and 86% higher for firms with sales of foreign affiliates[4].

It is important to control for the skill level of the firm, especially since services are intensive in intangible rather than tangible investments of which human capital is the most important. Skills are proxied by the average wage paid by the firm (*log labour cost*). Labour cost per employee has been found to be a good proxy for human capital (Mulligan & Sala-i-Martin, 1995). In order to control simultaneously for productivity and human capital effects, labour cost relative to the industry average (*relative labour cost*) is added in an alternative specification[5].

Service characteristics: For specifying the impact of service characteristics we follow recent developments in the field of consumer behaviour. These developments examine how the nature of goods and services affects market transactions. Some studies concentrate on the intangibility aspects (Krishnan & Hartline, 2001; Laroche, Bergeron & Goutaland, 2001; Laroche, Yang, Bergeron & McDougall, 2005), others on the search-experience-credence framework (Iacobucci, 1992; Ostrom & Iacobucci, 1995; Thakor & Kumar, 2000; Girard, Silverblatt & Korgaonkar, 2002; Huang, Lurie & Mitra, 2009; Nakayama, Sutcliffe & Wan, 2010) and others combine the two (Verhaegen, Boter & Adelaar, 2010).   Each service can be considered as possessing a bundle of characteristics which define what sort of service we are dealing with.

Physical tangibility (*Tangibility*) is the characteristic most often used to characterise services. Services which are high on physical tangibility are more storable and more transportable and would be expected to be more amenable to exports.

Generality measures the ease with which it is possible to envisage a product and would also be expected to promote exports over local presence.

Mental intangibility measures complexity and certain goods can be more complex than some services (*Complexity*). Complex services require more within firm interaction and firm specific knowledge, which a firm is also likely to wish to keep at headquarters rather than transfer to a subsidiary from where it might leak out.

The search-experience-credence framework relates to the degree to which it is possible to evaluate quality of the service prior to purchase.

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[4] It is interesting to note that we do not observe increasing productivity with firm size which would seem to indicate that economies of scale for services are less important than for manufacturing. The difference in productivity between domestic firms and both exporters and firms with sales through foreign subsidiaries is generally also greater for the smaller firms.

[5] Relative labour cost is calculated by dividing labour cost in a firm by the average labour cost for that industry, then subtracting the minimum value of labour cost from the resulting ratio and normalising the result by dividing by the range of labour costs times 100.

A search good is a good or service with features and characteristics easily evaluated before purchase (*Search*). These features facilitate price comparisons which can make purchasing cross-border more advantageous. They can also be considered as the obverse of complexity in that there is no compelling reason to supply them from the home base.

An experience good is a good or service where product characteristics, such as quality or price, are difficult to observe in advance (*Experience*). Since experience goods are inherently more risky to purchase and rely more on local reputation as a result they would be expected to be supplied more from local affiliates. A credence good is a type of good or service with qualities that cannot be observed by the consumer even after purchase (*Credence*). Many professional services take this characteristic.

Services which require the simultaneous presence of both the supplier and the customer incur costs of moving one or the other to the place where the service is to be provided (*Mode*). In this it is analogous to the transport costs incurred by goods except that it is usually more costly to move people than goods. It would be expected to act to favour local presence over exporting. Recent technological and market developments favour co-production and co-creation of a service involving both the supplier and the customer in the service provision process (Ordanini & Pasini, 2008). This derives from a specific characteristic of the service provision, namely, that the production phase cannot easily be disconnected from consumption activity. They will most often require the simultaneous physical presence of both parties.

From the service characteristics developed above, a set of service characteristics for each service that corresponds to the trade in services data is extracted using the methodology set out in the box below. The set of service characteristics is then matched with the corresponding data on exports and FDI of services to complete the set of explanatory variables.

Measuring service characteristics

The empirical studies provide a rich basis for comparison of characteristics across goods and services on a number of dimensions. Unfortunately, they do not measure the different characteristics at the level that is required for the purpose of this paper. For the purpose of this exercise, ninety-six goods from level 2 of the combined nomenclature for goods (CN2) and forty-two services from the EBOPS classification of trade in services have been coded using the methodology from earlier studies. Three different coders answered the questions in Table 4 using a seven-point scale for each product in order to triangulate results.

The method applied involves treating the different characteristics as constructs. It is then necessary to verify that the questions in Table 4 below are related to the construct in question and not to some other construct and that the different constructs are themselves sufficiently distinct from one another. Factor analysis is commonly used at this stage to establish convergent validity and discriminant validity. In order to facilitate comparison across the different characteristics, the factor scores have been normalised so that they conform to the original one to seven scale and the ranking on experience and credence reversed so that a higher value indicates also higher in experience or credence characteristic. Each of the indicators loads strongly and positively on the relevant construct. Reliability of the results of the factor analysis was confirmed with a Composite Reliability indicator (CR) above 0.7 and convergent validity with both a CR above Average Variance Extracted (AVE) and a value of AVE above 0.5. Finally, a value of Average Shared Variance (ASV) lower than AVE was used to establish discriminant validity.

Source: Verhagen *et al.*

Table 4 Characteristics of Services

Physical Intangibility			Generality			Mental Intangibility		
7-point Likert scale from strongly disagree to strongly agree								
This product is very easy to see and touch	I can physically grasp this product	This product is very tangible	I could easily explain many features associated with this product	It is not difficult to give a precise description of this product	It is easy to describe many features related to this product	I need more information about this product in order to form a clear idea of what it is	This is a difficult product to think about	This is not the sort of product that is easy to picture

Search			Experience	Credence
7-point semantic differentials				
hard to evaluate before purchasing - easy to evaluate before purchasing	hard to describe - easy to describe	hard to inspect before purchasing - easy to inspect before purchasing	difficult to know without experiencing it - easy to know without experiencing it	difficult to know **even after** experiencing it - easy to know after experiencing it

In addition to the above characteristics, another important service characteristic that affects the decision to export versus FDI is the need for proximity between provider and customer. When physical proximity is required either the customer must move to the supplier (mode 2 under the GATS) or the supplier must move to the customer (mode 4 under the GATS). For certain services for which either the necessity to move is inherent in the service (construction services must be supplied in situ) or where it is the overwhelmingly dominant way to provide a service (the customer moving physically to the provider in the case of travel), a simple identification of the mode by which the service is supplied should be sufficient to take in the proximity requirement.

However certain services can be supplied in multiple ways and this creates a problem of identification because the data on cross-border trade do not distinguish between the different modes. Physical proximity is not always required for interaction to occur and physical proximity is becoming less and less necessary for certain services so that any identification of modes 2 and 4 is likely to change over time. Based on work in the World Trade Organisation (WTO) an identification was made of the principle mode by which different services are traded at that point in time (WTO, 2008; 2009). A dummy variable (*Mode*) was then created taking the value of one for services for which the principle mode requires either the supplier or the customer to move physically across a border.

5.2 Results

Annexe Table 2 presents summary statistics for the 61,640 service-year-firm observations. The average share of sales of foreign affiliates is very low at 2.6% because nearly all firms internationalise via exports rather than through FDI. Services traded are higher in complexity than generality or physical intangibility. They are also experience rather than search goods. 55% of observations also usually require some physical interaction between supplier and client.

Table 5 presents the results of the Tobit regressions and applies to all firms in Belgium with at least one employee. The estimated coefficients in a Tobit regression are the marginal effects of a change in an independent variable X_j on y^* the unobservable latent variable, as specified in section 5.1 :

$$\frac{\partial E(y^*|X_j)}{\partial X_j} = \beta_j$$

but that is not very useful. If instead we evaluate the effect on the observable y in place of the unobservable latent variable y^*, we find that:

$$\frac{\partial E(y|X_j)}{\partial X_j} = \beta_j \times Pr[a < y_i^* < b]$$

where a, b specify the limits of the interval, in our case zero and one.

The Tobit estimation method employs maximum likelihood to combine the Probit and regression components of the log-likelihood function. An increase in an explanatory variable with a positive coefficient implies that a firm that only exports is more probable to also sell locally in the foreign market. The predicted probability of a nonzero value will increase. For a firm that already sells via foreign affiliates, an increase in X_j will imply that the expected share of sales of foreign affiliates will increase.

Column (1) of Table 5 uses only firm variables. Service characteristics are added in column (2). Adding service characteristics improves the fit of the regressions. The pseudo R^2 is markedly higher and Akaike's information criterion (AIC) lower indicating a better fit. Hence, adding service characteristics provides additional information and explanatory power to the choice model. Both firm and service characteristics play a role in explaining the choice between exporting and permanent presence as a means of supplying foreign markets with services.

The results for the firm level variables suggest that firms that sell a higher share of their total trade through foreign subsidiaries are larger, older, less likely to also import services but more likely to export goods and more likely to be a subsidiary of a foreign firm. They also have higher productivity, as measured through the value-added measure. It is interesting to note here that these firms are almost twice more productive than the non-internationalized firm and nearly a third more productive than exporting firms. These results are in line with those that apply the proximity-concentration model to services. The coefficient for firms located immediately on an internal border changes from negative as expected with the firm level only regression to positive when service characteristics are added. The coefficients however are not significant.

Service characteristics also behave as expected. Physical tangibility and generality are both negatively signed and generality is highly significant, indicating that services that are more physically tangible and which are easy to identify are more likely to be traded through exports than through sales of foreign affiliates. That generality rather than

physical tangibility represents a more important differentiating factor for trade in services follows from the nature of services for which the category "intangible goods" (Hill, 1999) comes into play. These are services that can be stored and transported over the internet but which are nevertheless intangible in nature. Information services are an example of services that are high on generality but low on physical tangibility. Mentally intangible or complex services are also more likely to be exported. This is in line with the findings of Ariu & Mion (2017) and Oldendski (2012) who both find that complex services are more likely to be exported.

Search and experience characteristics are both positive and significant and tend to encourage sales via FDI over exports. While the search characteristic might have been expected to encourage exports over FDI, the search for lower cost local provision appears to take precedence. That the experience and credence characteristics tend to be more supplied via FDI is in line with their more risky character although in the case of credence the coefficient is not significant

The mode variable indicating that a service requires proximity between supplier and customer is positive and highly significant. This is in line also with the results of the findings of Ariu & Mion (2017) and Oldenski (2012) that services that require face to face communication or information that needs to be communicated from the firm to an outside customer during delivery or sales are more likely to be supplied through a commercial presence. Overall, the individual service characteristics perform well.

Column (3) replaces the log of the firm's labour productivity by the log of labour cost per employee as a measure of human capital. In column (4) both variables are included in the same regression. Since both value added per employee and labour cost per employee are closely related, a multicollinearity problem arises. To reduce this problem labour cost is expressed relative to the industry average in the last regression.

Both productivity and labour cost are found to matter for the selection into internationalisation. The coefficient on labour productivity in columns (1-2) is positive and significant at the 0.001 level. This is in line with the higher cost of FDI compared to exporting and, hence, demands higher levels of firm productivity. It goes in the direction of the literature on FDI in goods and several studies of services but contradicts some of the literature on FDI in services. Labour cost per employee as a proxy for human capital in column (3) is also signed positively and significant at the 0.001 level. For services, the intangible assets from which firms derive their competitive advantages are closely related to the level of human capital within the firm. When labour cost relative to industry average is combined with labour productivity in column (4) both are positive and significant and the goodness of fit further improves.

In column (5) we present the marginal effects at the mean for each of the independent variables in column (4). The marginal effect on the share of sales of foreign affiliates measures the change in the expected share of sales of foreign affiliates (including non investors) for a unit change in X. For dummy variables, the marginal change refers to a change from zero to one. The marginal effect is calculated as the Tobit coefficient

multiplied by the probability of having an uncensored observation. The probability of having an uncensored observation is very small, which explains why the marginal effects also tend to be very small. The probability of an uncensored observation evaluated at the means of the independent variable falls even below one percent. However, for a variable at the firm level, we see a large marginal effect for Inward FDI. Being the affiliate of a foreign firm raises the expected share of sales by their affiliates by about 11 % emphasising again the coordination centre effect and ownership as an influence on the choice between exports and FDI. As expected, at the level of service characteristics, the requirement for interaction between supplier and client continues to have the largest effect.

Table 5 Tobit regressions of share of sales of foreign affiliates in total foreign sales

	(1)	(2)	(3)	(4)	(5)
log turnover	0.5412***	0.5240***	0.4917***	0.4979***	0.0030***
	(0.0869)	(0.0812)	(0.0818)	(0.0812)	(0.0005)
log age	1.0733***	1.0887***	1.0400***	1.0896***	0.0066***
	(0.1773)	(0.1726)	(0.1693)	(0.1717)	(0.001)
border	-0.2221	0.0058	0.127	0.077	0.0005
	(0.2864)	(0.2812)	(0.2831)	(0.2825)	(0.0017)
service imports	-1.5256***	-1.4098***	-1.5248***	-1.4644***	-0.0081***
	(0.3116)	(0.3019)	(0.3068)	(0.3046)	(0.0013)
goods exports	0.495	0.5919*	0.5930*	0.6035*	0.0041*
	(0.2543)	(0.2475)	(0.2488)	(0.2471)	(0.0018)
Inward FDI	5.8259***	5.5105***	5.4772***	5.5040***	0.1092***
	(0.7424)	(0.6985)	(0.6866)	(0.6918)	(0.0234)
log productivity	0.8076***	0.7462***		0.6054***	0.0037***
	(0.1581)	(0.1502)		(0.1581)	(0.001)
log labour cost			1.6966***		
			(0.3258)		
relative labour cost				0.0495***	0.0003**
				(0.0148)	(0.0001)
Tangibility		-0.0736	-0.127	-0.0847	-0.0005
		(0.2001)	(0.2004)	(0.1989)	(0.0012)
Generality		-1.2641***	-1.2383***	-1.2655***	-0.0077***
		(0.2905)	(0.2851)	(0.2893)	(0.0015)
Complexity		-0.4547*	-0.4723*	-0.4727*	-0.0029*
		(0.224)	(0.222)	(0.2232)	(0.0013)
Search		1.3304***	1.2793***	1.3139***	0.0080***
		(0.3218)	(0.3198)	(0.3204)	(0.0019)
Experience		0.7903*	0.7528*	0.7939*	0.0048*
		(0.3245)	(0.3224)	(0.3244)	(0.0019)
Credence		0.0772	0.051	0.0643	0.0004
		(0.1965)	(0.1975)	(0.1966)	(0.0012)
Mode		1.6055**	1.7180***	1.6330**	0.0101**
		(0.506)	(0.5068)	(0.5063)	(0.0031)
Industry Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
constant	-32.7503***	-35.0438***	-43.3135***	-33.0593***	
	(2.852)	(3.5139)	(4.7212)	(3.5036)	
sigma					
constant	5.2011***	4.9758***	4.9694***	4.9643***	
	(0.3919)	(0.3652)	(0.3638)	(0.3641)	
N	61640	61640	61640	61640	
pseudo R2	0.1241	0.157	0.1576	0.1589	
AIC	16300	15700	15700	15700	

Standard errors in parentheses; standard
errors are clustered at the level of the firm
* p<0.05   ** p<0.01   *** p<0.001

Since there are many firms with zero employees that also trade services but for which we do not have information on productivity, as a robustness check we also present results for all firms and compare them to the results for firms with employees inTable 6. Column (1) repeats the specification of column (1) of table 8 without productivity for all firms and likewise column (2) repeats table 5 column (2). Column (3) applies the identical specification of column (3) to firms with employees. It can be seen that there are no major differences between the two sets of regressions. Only the *border* and *Credence* variables change sign from negative to positive although the coefficients are not significant. Very small firms in border regions can serve purely local clients in the immediate vicinity cross-border. Zero employee firms that export are concentrated

among professional services that are high in the credence characteristic. They are able to overcome the risky nature of the service through high qualifications and reputation.

Table 6 Additional Tobit regressions of share of sales of foreign affiliates in total foreign sales

	(1)	(2)	(3)
log turnover	0.3680***	0.3569***	0.5969***
	(0.0826)	(0.0791)	(0.0803)
log age	1.2231***	1.2357***	1.0298***
	(0.1841)	(0.1801)	(0.1729)
border	-0.3913	-0.1922	0.0219
	(0.2971)	(0.2937)	(0.2785)
service imports	-1.4060***	-1.2993***	-1.4161***
	(0.3159)	(0.3073)	(0.302)
goods exports	0.6158*	0.7026*	0.5638*
	(0.2846)	(0.2798)	(0.2513)
Inward FDI	7.0565***	6.6792***	5.5245***
	(0.8297)	(0.7807)	(0.7009)
Tangibility		-0.2399	-0.137
		(0.2163)	(0.2019)
Generality		-1.6059***	-1.3088***
		(0.314)	(0.2917)
Complexity		-0.6872**	-0.5028*
		(0.2433)	(0.227)
Search		1.3182***	1.3067***
		(0.3497)	(0.318)
Experience		0.8067*	0.7283*
		(0.3474)	(0.3213)
Credence		-0.066	0.0544
		(0.2074)	(0.197)
Mode		1.5828**	1.6858***
		(0.5472)	(0.5079)
Industry Fixed Effects	YES	YES	YES
Year Fixed Effects	YES	YES	YES
constant	-23.2653***	-23.3113***	-26.6281***
	(1.9457)	(3.0158)	(2.9681)
sigma			
constant	5.9954***	5.7628***	5.0072***
	(0.4369)	(0.4112)	(0.3671)
N	75320	75320	61640
pseudo R2	0.1074	0.1378	0.1513
AIC	20100	19400	15800

Standard errors in parentheses; standard errors are clustered at the level of the firm
* p<0.05   ** p<0.01   *** p<0.001

6. Conclusions

In this paper we analyse for each service that the firm sells abroad to what extent they serve the foreign market through exporting and/or through sales by a foreign affiliate set up locally in the market. Some of the determinants of this choice are common to the firm, other are specific to the service. At firm level, we find that firms that internationalise their sales of services through FDI are older, larger, more productive and more human capital intensive than those that export. The model of Helpman et al. (2004) which posits that fixed costs for FDI are higher than for exporting and therefore the firms that internationalise via FDI need to be more productive than those that rely

exports also appears to work well for services. This contradicts some of the earlier literature on the choice between exports and FDI in services compared to goods (Bhattacharya et al., 2012; Wagner, 2014).

Central to the research question set out in this paper, we find the nature of the service to be an important determinant of the choice between exports and FDI. Each service can be considered as possessing a bundle of characteristics which define what sort of service we are dealing with. By focusing on the product in addition to the firm in the choice between exporting and FDI, it has been possible to exploit the fact that services are very heterogeneous and that each service displays different characteristics to see how the intrinsic nature of a service affects that choice. The importance of the requirement for proximity between supplier and user of a service is seen to be of particular importance. This parallels also the findings of the literature on task content of services. Other factors such as the ease with which it is possible to envisage a product rather than physical tangibility play an equally important role. While the difficulty of evaluating the quality of a service before purchase does have the effect of dampening the choice of exports over FDI, the complexity of a service does not seem per se to limit the possibility of exporting. Again, this is in line with the results of the task-oriented literature.

The paper highlights the large numbers of very small and micro firms that export services, including many professional service firms with only self-employed members. The fact that so many firms can and do export services should be taken as an indication that there would be potential to further develop cross-border trade in services in a well-functioning internal market. Since these firms are not well known and generally ignored in the literature, further study of their characteristics, how they internationalise and why they remain small would be desirable.

It would also be desirable to extend the current work in two directions. First the conclusions should be tested on a wider selection of countries and with more recent data to see to what extent the results presented are more general in nature. More recent evidence from a gravity model for imports to 22 European countries from 43 partner countries for 17 services covering the period 2006 to 2012 indeed indicates that proximity in particular is becoming less of an obstacle to cross-border trade in services (Smith, 2017). Second recourse to longitudinal data sets in place of repeated cross-sections would enable the dynamics of internationalisation in terms of the entry and exit of firms to be studied in relation to the overall growth of firms in an economy. In particular it could help to answer the question for a country such as Belgium "to what extent are the growth possibilities of firms restricted by a lack of internationalisation in services?".

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Annexe - Table 1 Services covered by the data

EBOPS	Service
100	Passenger transport on sea
101	Freight transport on sea
102	Supporting, auxiliary and other sea transport services
110	Passenger transport by air
111	Freight transport by air
112	Supporting, auxiliary and other air transport services
120	Other passenger transport (mostly land)
121	Other freight transport (mostly land)
122	Other supporting, auxiliary and other land transport services
142	Postal services
143	Courrier services
144	Telecommunication services
156	Construction services
162	Computer services
163	Information services
270	Operational leasing services
191	Legal, accounting, management and public relations services
194	Advertising, market research and public opinion polling
190	Research and development services
193	Architectural, engineering and other technical consultancy
196	Waste treatment and depollution
195	Other agricultural, mining and on-site processing
199	Other miscellaneous business, professional and technical services
231	Personal, cultural and recreational services
239	Scientific or educational services

Annexe - Table 2 Descriptive statistics for the variables

Variable	Mean	Std.Dev.	Min	Max
share affilate sales	0.03	0.16	0	1
log turnover	15.62	2.27	-4.61	23.70
log age	3.26	0.97	0	5.92
border	0.46	0.50	0	1
service imports	0.62	0.49	0	1
goods exports	0.21	0.41	0	1
Inward FDI	0.02	0.13	0	1
log productivity	11.30	0.78	3.43	19.46
log labour cost	10.79	0.43	7.22	14.20
relative labour cost	1.00	0.45	0.02	22.63
Tangibility	3.11	1.16	1	5.35
Generality	3.67	1.50	1.36	7.00
Complexity	4.06	1.65	1.11	7.00
Search	2.75	0.91	1	4.57
Experience	5.09	0.93	3.33	7.00
Credence	3.54	1.98	1	7.00
Mode	0.55	0.50	0	1

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