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Missing Trade in Services in the European Single Market

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FACULTY OF ECONOMICS AND BUSINESS

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Number 632 2018

Dissertation presented to obtain the degree of Doctor in Business Economics

by

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AND BUSINESS



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PREFACE

This dissertation has been a very long time in the making. It has its roots in the second half of the 1980s at the European Commission, when it began to be recognised that economies dominated by services might require different approaches to integration than the those pursued until then. At that time, analysis of the economy was dominated by material-based theories - which remains true today. Lack of reliable data on services, comparable to those which had long been available for manufacturing, precluded detailed analysis. The first task was therefore to put in hand, with the help of Eurostat, the collection of the necessary data. Only after twenty years had passed did data finally become available from structural business statistics along with some improvements to the statistics on trade in services. This dissertation is one of the first to use these data in a co-ordinated and comprehensive manner.

It soon became clear that an aggregate approach to services would not work and that the effectiveness of policy could only be assessed service by service. Single Market legislation in this respect was, however, hindered by a dearth of relevant economic analysis. The television without frontiers Directive had to be salvaged in extremis. More generally, the early competitiveness reports in the mid-1990s explored the relationship between different services provided as inputs to other businesses and the rest of the economy. The value-added approach subsequently applied to trade follows in this path.

A year long fellowship at the Weatherhead Center for International Affairs at Harvard University looked at the, at that time little addressed, issue of income inequality, employment and growth. It became increasingly obvious that the post-war welfare state and social services would have to play an important role in mitigating the effects of technological change and globalisation. A second Commission Communication with Lucio Pench on Services of General Interest at the beginning of the 2000s addressed the issue of the interface between market integration and social services. Preparatory work for the Hampton Court European Council, subsequently published in the form of an article with Marcel Canoy in the Intereconomics Journal, looked at wider issues of the European Social Model.

The issue of slow growth and poor employment performance in Europe, already central to the work on competitiveness, received a new in-depth look when acting as

rapporteur on the Sapir report on “An Agenda for a Growing Europe”. Given the predominance of services in the economy, poor economic performance can only be the product of weak performance in services. The Single Market Review and a series of workshops co-organised with the McKinsey Global Institute, the results of which were subsequently published in an article also with Marcel Canoy in the Journal of Industry, Competition and Trade, returned to the issue of performance of services in the European context.

At Harvard and subsequently, it became clear that while a background in economic history, economic geography and a MSc in Management was sufficient to analyse a market and develop policy related to those markets, the type of research envisaged required a deeper background in economic theory. Back to school at an already advanced stage in life meant four exhausting summer schools at LSE and a year in the master’s programme in economics at Birkbeck College, University of London. Thus armed, it was time to launch oneself on an enquiry into the reasons why the European single market programme had failed to produce the expected improvement in terms of economic performance. It must be acknowledged that this enquiry has produced only modest results.

The original intention to focus on the functioning of markets for services with a policy orientation gave way to one on trade as a driver for integration. From a necessary condition, trade in services became the main subject of the dissertation. Furthermore, from trade in general, the focus narrowed down to the question of “missing trade”. In turn this led to identifying obstacles to trade. In the end the dissertation came to address only some of these obstacles, namely those related to characteristics inherent to services and to the administrative, cultural, institutional and economic differences that continue to separate countries within Europe. Gains in focus, depth and academic rigour entailed an inevitable loss of generality and policy orientation

In the light of this outcome, it is legitimate to ask “why did it take so long to complete the dissertation?”. The first four years spent working part time in the Commission and part time in Leuven were productive neither for the Commission nor for research. Only on retirement from the institution in 2012 did research begin in earnest, leading to a first publication in the Service Industries Journal which became the basis for Chapter 1. The subsequent year was spent entirely working on data in the National Bank of

Belgium. Ultimately, after a number of vicissitudes, this became the basis for Chapter 2, co-authored with Leo Sleuwaegen. The reorientation towards a purely trade dissertation was accomplished with the paper on trade cost and services, which became the basis for Chapter 3, with a more extended version published in the European Review of Service Economics and Management. Chapter 4, also co-authored with Leo Sleuwaegen, finally brought the dissertation into the digital era with the treatment of the choice by consumers between purchasing online domestically or cross-border.

Along this long and sometimes bumpy ride, many friends and colleagues offered their support and encouragement. Alexis Jacquemin in the Commission provided the initial inspiration for combining academic research with policy relevance before being tragically cut short by illness. This dissertation is dedicated to his memory. Michel Ayral and Jean-Francois Marchipont acted as mentors during my career in the Commission. Fabienne Ilzkovitz, Paco Caballero and Kamil Kiljanski have all been influential in their dedication to bridging the gap between economic theory and practice and helped by keeping a friendly eye on my activities. Aleksander Rutkowski provided useful comments on earlier versions of the papers.

One of the great advantages of the Commission's in-house think tank is the ability for career insiders to work alongside and with outsiders from the academic world to mix policy expertise with analytical skills. In the Prodi Commission I was fortunate to work alongside Elena Saraceno and in the Barroso Commission with Marcel Canoy. Much was learnt from André Sapir, who replaced Alexis Jacquemin as head of the economics section and directed the team that produced the eponymous report.

Jacques Pelkmans is the indispensable go-to person for all those who study European integration in general but, more particularly, for all those who are interested in services and the Single Market, where he has trod a solitary path. Faïz Gallouj, the leading authority on the economics of services, first encountered through the European association for research on services, RESER, never faltered in his encouragement, advice and enthusiasm. The annual conference of RESER is the meeting place where all those who study services can exchange ideas and keep up to date. It welcomes all and sundry with an interest in the subject. I am grateful to both of them for agreeing to serve as external members of the doctoral committee.

In Leuven, thanks must go first of all to successive generations of doctoral students who welcomed this rather odd bird in their midst and made him feel less of an outsider. A special mention for Sam Arts, who began the doctoral programme at the same time and reached the exalted status of tenured associate professor by the time this dissertation was finished. After a somewhat skeptical beginning, Filip Abraham grew to appreciate the efforts of a wayward student. Jan Van Hove agreed to step in as co-promoter at a crucial juncture to salvage an enterprise in danger of foundering. Leo Sleuwaegen has proved a promoter made in heaven, frequently exasperated, sometimes despairing, but always supportive.

Finally, this dissertation would not have seen the light of day without the support of my family, and in particular of my wife, Henriette, who after her own trying, but ultimately successful battle with a doctorate at Leuven, was able to guide me through mine.

INTRODUCTION

This dissertation focuses on missing trade in services both within the EU and between the EU and third countries. The degree to which services are traded cross-border remains low for most Member States in spite of the way technology facilitates the way services can be traded and efforts to create a Single Market for services. This result calls for an explanation of so called missing trade for services and leads to the research question:

Which factors can explain missing trade in services?

Trefler (1995) coined the term "missing trade" to denote the difference between observed trade and expected trade when countries could fully exploit their comparative advantages in open markets. Starting from the assumption of frictionless trade, Trefler set out to measure by how much exports of goods fell short of the expected. He then attempted to provide some explanations for the shortfall observed. These three elements are present in the subsequent literature beginning with McCallum (1995) and Helliwell (1998), who used gravity equations to measure the border effect between internal and external trade of goods. They use the term home bias to describe the way in which national borders effect trade. Gravity equations are applied to imports of services in chapter three.

The literature on missing trade has been applied mainly to exports of goods. The definition and measurement of missing trade in services needs to be extended to include foreign investment because of the importance of commercial presence as a means to supply those services that require physical proximity between supplier and user. This is the approach to trade in services taken both by the World Trade Organisation for the General Agreement on Trade in Services (GATS) and by the European Union under the Single Market Programme (SMP), where cross border trade is known as the freedom to provide services and foreign direct investment as right of establishment.

An alternative approach to gravity equations has been developed in the finance literature on home bias for equity (French and Poterba, 1991). It measures the degree to which investors in a particular country hold a larger share of local assets in their portfolio than what these local assets represent as a share in the total of world assets.

Correspondingly, if we take trade in services to include sales by affiliates of foreign firms (inward foreign direct investment) as well as imports, home bias could be measured as an overrepresentation of sales by domestic firms in the total of sales in a country. This is the approach developed in chapter one. The degree of home bias for services would not be expected to be the same as that for equity home bias because transaction costs for trading services internationally are much higher than those for equity.

Home bias and border effects have been used as a measure of market integration as well as missing trade. However, in a fully integrated market, users will be indifferent to the origin of the goods and services that they purchase. In that situation, home bias is no longer a measure of integration. It is only where there are obstacles that are placed in the way of purchasing abroad that the optimum pattern of purchasing is undermined and home bias becomes a problem. These obstacles may stem from many causes both natural and artificial. Comparative analysis across countries and the evolution of home bias can provide an indication of the extent to which obstacles can be reduced.

Crucially it is necessary to separate different types of obstacle to integration. To what extent are obstacles natural ones stemming from the physical characteristics of a product (good or service)? What role do consumer preferences play in home bias? How do a common culture, shared language and mutual trust between parties to a transaction affect home bias. There are many other obstacles than regulation that might explain missing trade for services. This dissertation looks at non-regulatory obstacles to trade in order to better identify their nature and extent, in particular those barriers related to product characteristics and those barriers related to culture, language and mutual trust. This is important to disentangle to what extent home bias is due to market imperfections that can be corrected by policies and to what extent it is caused by non-policy-related reasons. Barriers relating to product characteristics receive special attention in chapters two and three, barriers relating to language in chapter three and barriers relating to culture and mutual trust in chapter four.

Following the logic of previous work, the dissertation devotes much attention to the definition and measurement of missing trade in services, which as mentioned needs to be extended to include trade through a commercial presence as well as cross-border. Chapter one is largely devoted to this issue. It finds that FDI is the means of choice to supply EU markets for services and the missing trade element largely applies

to imports rather commercial presence. However, of particular importance is the examination of the amount and forms of missing trade for the different types of service. Services are very heterogeneous and it would not be expected that either the amount or type of missing trade would carry over from one type of service to another. Indeed there are some important differences identified in chapter one at the level of the individual service. The amount of trade also differs markedly across countries within Europe; differences that cannot be attributed to either country size (smaller countries are more open) or to the sectoral composition of trade (some countries are heavily dependent on tourism for services trade).

Because of the importance of commercial presence as a means to supply markets for services, chapter two examines the choice between the two means of trade. In order to throw light on the reasons behind the preference for FDI over cross-border trade it uses Belgian data on individual firms. Absence of cross-border trade may be the result of a lack of firms that are willing to engage in trade in services because the obstacles are too high or it may be that the advantages of sales through local affiliates outweigh the lower cost of supplying a market through exports. Advantages of selling through foreign affiliates may then be attributed to the inherent characteristics of services. The degree to which firms are willing to participate in trade in services is measured first through the decision whether to trade services or not, irrespective of the form in which trade takes. This is further developed in terms of whether a firm that exports services also sells through foreign affiliates. Finally, the chapter looks at the amount of sales of foreign affiliates for those firms that do sell through a commercial presence.

Since chapter one identified imports as the main element of missing trade, chapter three examines this issue in more detail using Eurostat country level data on cross-border trade in services. Gravity equations are used first to establish whether the standard explanatory variables used to explain missing trade for goods also apply to services and then whether the service characteristics that can help explain the choice between cross-border trade and permanent presence can also shed light on why some services are so much more traded cross-border than others. The chapter further examines the degree to which these explanatory factors have developed over time and finds evidence that certain characteristics of services are becoming less important.

Chapter four extends the literature on missing trade by providing a new measure of border effects in the probability of an individual purchasing cross-border relative to the

probability of purchasing exclusively domestically for one service, e-commerce, for which obstacles to purchasing cross-border should be reduced. Since chapter one showed that there are important differences in the degree to which services are traded in Europe between different countries, it more particularly addresses obstacles linked to country characteristics while also controlling for the personal characteristics of purchasers and for the products that arevtypically purchased via e-commerce.

Taking together the different aspects developed here, the various chapters provide complementary insights, from the supply as well as demand side point of view, why services continue to be traded less intensively than goods. As this dissertation will demonstrate, the barriers are not exclusively related to differences in regulation. They stem also from obstacles and barriers related to the characteristics of services and to the administrative, cultural, institutional and economic differences that continue to separate countries within Europe.

Neither the characteristics of services nor the administrative, cultural, institutional and economic differences that continue to separate countries within Europe are immutable. Technology in particular has the capacity to alter the way in which services are traded cross-border as well as providing new services that did not previously exist. Convergence in economic performance and levels of development as well as taste can also contribute to greater potential for trade in services. Europe will never be one homogeneous area but trade in services can help to bring together the different parts.

Chapter 1.
HOW INTEGRATED ARE EU MARKETS FOR SERVICES?

1.1 Introduction

2017 marked the twenty-fifth anniversary of the date originally set to complete the EU Single Market. In parallel to the Single Market Programme (SMP), the EU was engaged in the Uruguay Round of trade negotiations leading to the creation of the World Trade Organisation (WTO) in 1994. The SMP was launched as a response to Eurosclerosis and intended to rejuvenate the European economy by injecting a dose of competition and dynamism to national economies that had become dangerously mired in stagnation. Economic integration within and without Europe was the tool to achieve this turnaround. Given that services dominate European economies, the success or failure of the SMP and the WTO to deliver on its original goals of higher economic growth and more employment depend to a large extent on the success or failure of market integration in the field of services. Has the SMP succeeded in bringing previously separated national markets together?

Market integration should arise from a process of removing barriers that inhibit trade crossing territorial borders providing that natural barriers do not also inhibit such trade. It is an outcome while the SMP can be seen as a process. The outcome as such is not directly measurable. Instead, openness to trade has traditionally been used as a measure of integration. While increased trade can be expected to drive the process of integration as has been observed for goods over a long period, it is clearly not synonymous with it. Missing trade goes a step further than the mere observation of existing trade flows by comparing the realised with the expected. It can be considered as a possible margin for improvement.

Even concentrating on missing trade as a surrogate measure poses considerable problems for services. The definition of trade needs to be widened to include the sales of foreign affiliates since services that require proximity between supplier and client are more difficult to supply cross-border. Services are very heterogeneous and aggregate measures are not very meaningful. Data at the requisite level of detail has only recently become available and still suffers from serious problems of coverage

and timeliness. Developing a suitable yardstick against which actual trade can be measured poses difficult conceptual and practical issues for services.

The chapter makes a number of contributions. It measures for the first time in a coherent manner the degree of openness to trade of markets for services. It does so for the different major types of services and for several countries, including many New Member States, for a single benchmark year. It uses the resulting measures to compare the expected with the realised outcome in order to identify those services on which efforts to remove remaining barriers should be concentrated.

Section 2 revues some of the literature on trade and economic integration, in particular as it applies to the European experience. Section 3 explores the methodological issues relating to measuring market integration. Section 4 presents the data and section 5 the results of the current exercise. Section 6 concludes.

1.2 Market integration

The study of economic integration in general and as applied to the European case underwent considerable theoretical development in the post-war period pioneered by Tinbergen and Balassa. Tinbergen (1954) made an important distinction between negative and positive integration. Negative integration refers to the removal of existing barriers such as tariffs. Positive integration implies the creation of common rules to apply throughout the area in question. While both are required to successfully integrate national economies, positive integration is particularly important for services because barriers to trade in services take place behind the border and often arise from differing regulatory regimes. Balassa (1961) introduced the idea of different levels or stages of integration. Free trade areas denote a lower level of integration than a customs union which is lower than a common market and economic union. In this chapter the focus is on the common market for services. Subsequent work has emphasised scale economies, imperfect competition and economic geography (Sapir, 2011).

Following Balassa, economic integration refers to both a (dynamic) process and a (static) state of affairs. Most of the subsequent literature has been concerned with the dynamics, for instance the reduction of barriers to trade or the impact of successive enlargements of (what is now) the European Union (EU). While European integration is clearly an on-going process, which can be interrupted or even reversed, adopting a

static approach which looks at where an integration process has arrived at a specific point of time is a valuable and neglected one which this chapter aims to fulfil.

Pelkmans (2006) defines economic integration as the elimination of economic frontiers between two or more economies. He makes the important point that:

"There is no a priori reason for assuming that economic frontiers coincide with territorial frontiers: countries are demarcated by territorial frontiers, and economies by economic frontiers. Thus, local economies need not always add up to one regional economy if economic frontiers between different local communities persist. Likewise, economic frontiers between regions may inhibit national economic integration. European economic integration is driven by efforts to reduce or eliminate the public role of territorial frontiers with European neighbours as economic frontiers. But, as the definition implies, this is a necessary, not a sufficient, condition for economic integration. Demarcations within and between national economies may remain, perhaps as a result of natural barriers… the costs of which have not been sufficiently reduced by infrastructural and transport provisions, or perhaps as a result of great disparities in the levels of development, or perhaps as result of business collusion in a region or country." (Pelkmans, p.3)

The objective of the SMP is remove barriers to market integration that stem from the existence of national borders. This does not imply that a single homogeneous market would emerge. Instead local cross-border markets in frontier regions or markets that constitute more than one Member State but less than the whole might emerge on the basis of shared language, culture, climate or other factors. Market integration merely means that internal borders are no longer the most important feature of how to define a market and that market participants are behaving as if these borders no longer exist.

How is market integration expected to be achieved once barriers have been removed? Increased cross-border trade in goods, services, capital and labour are expected to drive integration through the desire to seek out new markets by those who wish to export and by those who wish to broaden their sources of supply by those who wish to import. Particularly for services, the concept of trade has to be broadened to include the sales of foreign affiliates.

Market integration should result in more competition on the different markets. This may come directly in the form of foreign trade and investment or indirectly through the threat that foreign suppliers may pose to previously protected national or local suppliers. Potential competition from foreign suppliers is analogous to the threat of entry for incumbents and can be linked to the literature on the contestability of markets (Baumol, 1982). In practice some actual trade will be required in order for the threat of entry by foreign suppliers to become credible. How much is required will of course be determined by the nature of the market in question.

For services where permanent presence is a very important form of internationalisation, a measure based exclusively on cross-border trade is seriously incomplete. However the impact of foreign direct investment on competition is unlikely to be similar to that of cross-border trade. One important motivator for FDI in goods has been tariff jumping, or the desire to avoid a protectionist measure by going behind it. For services the equivalent would be regulation jumping whereby a firm will try and circumvent regulatory impediments to trade by setting up under the host country's rules and regulations. Foreign investment may take place through greenfield investment, the acquisition of an existing firm, through joint ventures or arms length modes such as licensing or franchising. In all cases the foreign firm will benefit from the protection accorded to domestic firms against the threat of imports from other countries. To the extent that sales of foreign affiliates replace those of domestic firms the effect on competition will be muted.

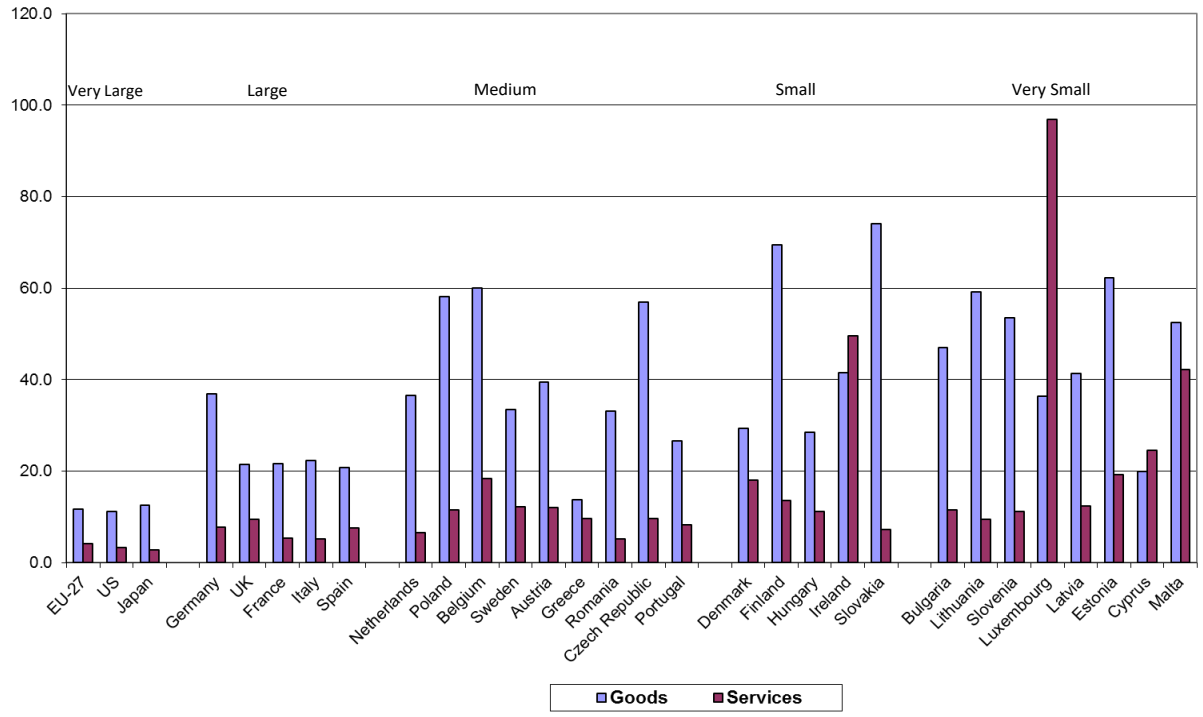
Competition is not valued for itself but as a means to provide benefits in terms of cheaper prices, more variety and higher quality. Greater competition is also expected to drive gains in terms of productive efficiency and through higher productivity the ability to increase also incomes. Lastly the desire to escape competition on existing markets is expected to spur innovation. European integration therefore is a means and not an end, expected to work through increased trade to stimulate more competition.

1.3 Measuring Market Integration

The European Commission defines EU trade integration as the percentage of a country's GDP that is accounted for by trade with EU countries (imports and exports), in either goods or services. Eurostat publishes data on its website under the heading "market integration indicators", but this time including extra as well as intra-EU trade.

According to the Commission, higher values are taken to indicate the economy is more open, competitive and integrated, in relation to the size of its economy. Changes over time may indicate policy measures that reduce trade barriers or provide more favourable business conditions for trade. Confusingly in the EU single market scoreboard the Commission also defines trade integration as exports/GDP and market openness as imports/GDP (European Commission, 2016).

Figure 1-1 Imports and Exports as % of GDP, 2009



Source: Eurostat International trade in services - structural indicators [bop_its_str]

Traditionally the share of imports and exports as a percentage of GDP has been used as a measure of openness to trade rather than integration. It is only recently that interest in the degree and effects of integration have led to a measure of openness being applied as a measure of integration. The results of such an exercise are well known. Large countries are less open than small countries (fig. 1-1). Goods are much more open than services. Only three EU countries have a higher share of services trade in GDP than they do trade in goods: Ireland (business services), Luxembourg (financial services) and Cyprus (tourism).

The official European definitions of trade integration suffer from three major flaws which concern the concept, the definition of trade and the way in which it is measured.

The concept is flawed because it measures openness to trade and not integration. In order for openness to trade to have a normative value it must be related to some theoretically valid yardstick of how much trade should be expected under frictionless conditions. Second the definition of trade is flawed because it ignores the substantial amount of trade that takes place through the sales of affiliates of foreign firms. Third it uses a flawed way of measuring the relationship between trade and the overall economy. Taken together these flaws should rule out their use.

Services are traded in a number of different ways and understanding trade in services is relatively more complex than trade in goods (Lejour & Smith, 2008)[1]. The General Agreement in Services (GATS) classifies trade in services according to four different modes and these have been widely adopted in the literature. The first way and the nearest equivalent to trade in goods is direct cross-border transactions in which the purchaser of the service is located in one country and the provider in another (mode 1). Transport services are usually provided in this way. Services also cross borders when the consumer moves to the country of the provider to obtain a service (mode 2). This is the typical way in which tourism operates. Instead of the consumer moving, the supplier can temporarily move to the country of a client to provide a service (mode 4). Professional services such as management consulting as well as construction are often traded this way.

Collectively modes 1, 2 and 4 under the GATS constitute cross-border trade in services (table 1-1). The EU applies the term freedom to provide services to cross-border exchanges of services irrespective of whether they take place under mode 1, 2 or 4. It should be noted that when the definition of cross-border trade is broadened to include these three modes all commercial services and many social services including health and education can be traded cross-border. The tradability of services cross-border therefore needs to be taken as a given. It may not be in the commercial interest of a firm to trade cross-border but this does not affect tradability of services. Restrictive regulations may also make it difficult or even impossible to trade cross-border but these restrictions again do not affect the inherent tradability of services.

[1] It should be noted that intra-firm trade is important for both goods and services. While the USA has long collected data on intra-firm trade, other countries have been slow to follow its lead and the lack of up-to-date comparable data across countries unfortunately precludes adequate treatment of this important topic.

Table 1-1 Forms of cross-border trade by type of service

Sector	**Mode 1** **supply from the territory of one country into the territory of another**	**Mode 2** **supply in the territory of one country to the service consumer of an other country**	**Mode 4** **when an individual is present in the territory of an economy other than his own to provide a commercial service**
Construction			Exclusively
Distribution	By e-commerce and other forms of distance selling	Purchases while abroad	Possible but little practised (ambulatory)
Transportation (air, water, land)	Exclusively		
Postal	Letters and parcels		
Telecommunications	Voice and Data (including call centres and video conferencing)		
Computer services	Downloadable software, batch processing of data, remote control of facilities		Development and installation of hardware, software and on-going technical assistance
Information and publishing	E-books, data bases		
Audio-visual Services	Downloading of music, films, videos and pictures	Audience goes abroad to attend gigs, concerts and exhibitions	Recording of films and music abroad Performance abroad of gigs, concerts and at festivals

Sector	Mode 1 supply from the territory of one country into the territory of another	Mode 2 supply in the territory of one country to the service consumer of an other country	Mode 4 when an individual is present in the territory of an economy other than his own to provide a commercial service
R&D		The client may go to the firm undertaking R&D for instance to track progress but mode 4 is more usual	The firm undertaking the R&D travels to the client to agree terms, to ensure that the research meets requirements and to present results
Professional services (including Legal & accountancy services, Architectural & engineering services, Advertising & market research and Management consultancy)		The client may go to the firm providing the service to agree terms or track progress, but mode 4 is much more usual	The firm providing the service travels to the client to agree terms, to ensure that the service contracted for meets requirements and to present results

Services are commonly traded through a permanent commercial presence in the host country (mode 3 of the GATS terminology). The EU applies the term right of establishment to services that are provided through foreign affiliates. The figures for FDI tend to underestimate the significance of permanent presence for the provision of services because non-equity forms of participation constitute an important means for foreign companies to penetrate the markets of third countries. They include such techniques as franchising, management contracts, concessions and public–private partnerships and are prevalent in industries as diverse as hotels, restaurants and fast-food, car rentals, retailing and construction (UNCTAD, 2011). For many professional services, partnerships composed of locally established professionals are often the

dominant or even required form of operation. Ownership restrictions of airlines have led to the growth of alliances of major carriers. Limitations on the availability of data unfortunately preclude the inclusion of non-equity forms of trade in FDI.

Firms may decide to supply services abroad through a permanent presence because it is more convenient to do so when sustained interaction with clients is required, when they are better able to exploit firm specific competitive advantages through foreign investment than by exports or as a means to circumvent restrictive regulation or to take advantage of opportunities opened up by the privatisation of public services. New Member States of the EU for example were the recipient of major inward investments in the distribution and financial sectors following the fall of the Berlin wall and their conversion to market economies.

It should be noted that Member States have been far more willing to countenance market opening through right of establishment, by which they retain a degree of control over the operations of companies on the domestic market, than through freedom to provide services. This leads to a rather unbalanced process of market liberalisation in favour of foreign direct investment over cross-border trade, with a potential impact on the actual degree of competition. The attention given to both forms of market opening justifies including both in any measure of trade.

In addition to cross-border provision and permanent presence, there are two further ways in which services may be traded. Domestically produced services may enter into trade through their incorporation in goods or other services that are themselves exported. All goods and services incorporate a significant share of producer services directly or indirectly through their share in other intermediate inputs. This is the value added approach currently developed by the OECD. A weakness of the value added approach is that it is applied at the level of the industry rather than the individual firm, while much of the current literature on trade is built around the heterogeneity of firms with regard to trade.

The task approach is the final way in which it is possible to consider trade in services. It looks at the service content of trade in terms of the share of service occupations in the production of traded goods and services, irrespective of whether those service occupations occur in firms whose main activity is the production of services or goods.

It therefore differs from the value added approach which looks at how the output of service firms enters trade as intermediate consumption of goods and services that are traded internationally.

Standard measures of openness to trade in terms of imports and exports as a percentage of GDP fail to provide an accurate or consistent picture of the degree to which trade leads countries to be inter-dependent. Recent work on measuring trade using the value added approach point to a substantial over-estimation of trade in goods as well as under-estimation of trade in services (Hummels, Ishii & Yi, 2001; Daudin, Rifflart & Schweisguth, 2011; Johnson & Noguera, 2012 a,b,c). Comparisons between trade for different types of services also need to take into account the different ways in which services can be traded, both cross border and by a permanent presence.

Finally, standard indicators provide an inaccurate measure of openness to trade. The numerator (trade) is measured in terms of turnover or gross output while the denominator (GDP) is a value added related measure. The development of outsourcing for part of the production chain has led to a rise in trade for intermediate products. As a result, the relationship between trade and value added is not stable over time.

If the way of measuring integration adopted by the European Commission is not fit for purpose, alternative methods need to be explored. Since market integration is expected to lead to more competition, one way of measuring integration would be to measure competition using price-cost margin indicators or market structure indicators such as the Herfindahl index (Griffith & Harrison, 2004). While this is a practical solution for individual cases such as those dealt with by competition policy, it would not be feasible as a measure of overall integration. Each market for goods and services would need to be defined at the requisite level and then assessed.

Market integration is expected to lead to price convergence through the law of one price, which as articulated by Jevons states that *"In the same open market, at any moment, there cannot be two prices for the same kind of article."* In an integrated market this implies that international relative price differentials should be arbitraged away so that identical goods in different countries should sell for the same price when expressed in a common currency (Pippenger, 2015). Since it should be relatively easy

to compare prices at least for products with identical characteristics and at retail level, it is not surprising that this “law” has often been put to the test and found wanting. Numerous violations are observed between cities of the same country and even within the same city, let alone between different countries (Parsley; Wei, 1996; Miljkovic, 1999; Crucini; Shintani; Tsuruga, 2009).

A key advantage of the law of one price for studying integration lies in the way that border effects can be controlled for directly by comparing prices. At European level, the availability of data from the purchasing power parities programme has made it a particularly attractive way of tracking progress under the Single Market Programme (European Commission, 1996, 2001, 2007). Monetary union and particularly the introduction of euro notes and coins with the attendant boost to transparency of prices across border also led to interest in the degree to which prices converge across the euro zone (ECB, 2002,2005, 2006, 2007, 2009, 2014).

Using final demand prices and more generally consumer prices to measure integration is subject to (at least) three major drawbacks. First, two thirds of goods and 45% of services were sold to other firms in the form of intermediate consumption in 2010 for the EU-28. Second for services, comparing prices is not at all obvious. Unlike commodities that can be traded on an exchange (soybeans), services are often highly differentiated. At the limit each service is unique (management consultancy) and there is a unique price for each act. Liberalisation of markets for telecommunications and air transport has led to an explosion of different prices in the form of a multitude of different types of package for telecommunications and prices that can change by the second for the same class of air ticket on the same route at the same time on the same day.

Third, price convergence does not need to be driven by market integration but may be the result of the Balassa-Samuelson effect, which suggests that productivity growth in the traded sector of an economy usually exceeds that in the non-traded sector. In practice relative prices of services are much lower in those countries with lower levels of development. While levels of development were relatively similar among the original six Member States, successive rounds of enlargement since 2004 have brought in members with much lower levels of development. All those countries for which the price level is above the average for the EU-15, taken as the core countries, have relative price levels for services that are at least as high and usually above those for

goods. All those countries for which the price level is below the average have relative price levels for services that are below those for goods. Generally speaking the farther the price level in a country is from the average, the higher the differential between prices of goods and services. Overall therefore differences in the prices of services within the EU can be expected to be heavily influenced by the Balassa-Samuelson effect rather than by the level of market integration achieved.

A possible way of selecting how much market integration is feasible would select existing countries with integrated national markets to act as a reference point. However, there are very few suitable candidates. They would need to be of continental size with sufficient diversity in terms of culture and preferences. They would also need to be of overall comparable average levels of development but with sufficient differences between constituent regions. Finally, the requisite data would need to be available to make the calculation possible implying data on production disaggregated by region, trade in goods and services between regions and local sales of affiliates of domestic firms by region to approximate the data on sales of foreign affiliates in EU Member States. No such country currently has all the necessary characteristics. Japan is too small and too homogeneous. The nearest is the US but all the necessary data are not available. For that reason studies have tended to use Canada as the reference country because of the easy availability of data on local production and on inter-provincial as well as international imports and exports. However the size of the Canadian market is in no way comparable to that of the US or EU although geographically dispersed and with at least some linguistic diversity.

Furthermore, an existing national market is not necessarily where successful economic integration in Europe should end up. Neither the US or Canada are fully integrated markets in the sense of Balassa since numerous forms of discrimination exists between states in the US or provinces in Canada. For example regulations on occupational licensing at state level in the US resemble those at national level in the EU and de facto constitute barriers to entry to suppliers from other US states (White House, 2015). Public procurement is another area in which the US states can operate discriminatory practises with regard to other states. Lack of integration in Canada was considered sufficiently worrisome that an Agreement on Internal Trade (AIT) similar in intention and scope to the EU's Internal Market programme was adopted in July 1995

and subsequently amended with regular tracking of achievements. Thus, Article 100 of the AIT states that:

"It is the objective of the Parties to reduce and eliminate, to the extent possible, barriers to the free movement of persons, goods, services and investments within Canada and to establish an open, efficient and stable domestic market. All Parties recognize and agree that enhancing trade and mobility within Canada would contribute to the attainment of this goal."

The degree to which services are traded domestically constitutes another avenue by which the degree and possibilities for market integration for services might be explored. If services are constrained to limited local markets close to points of consumption within otherwise integrated national markets, then removing barriers to trade across borders will not necessarily lead to market integration. This would be an example of the type of natural barrier mentioned in the previous section. Once a service can be divorced from its demand, its localisation becomes free. Firms can concentrate production in order to benefit from scale, scope and agglomeration economies. Information and communication technologies should facilitate the separation of production and demand for services. Services for which production is more concentrated geographically than demand can be deemed to be traded domestically and therefore potentially internationally.

Jensen and Kletzer (2005) were the first to address the issue of the degree to which services are traded domestically through a pioneering study of co-location of production and consumption of services within US metropolitan areas. Subsequently their methodology has been applied to France, Denmark, Sweden and Finland and found to have wider applicability (Barlet; Crusson; Dupuch; Puech, 2010; Borchsenius; Malchow-Møller; Munch; Skaksen, 2010; Eliasson; Hansson; Lindvert, 2012; Huovari, 2012).

It is important to note that what is being measured by these indices is not whether the service is inherently tradable or not, but whether it makes sense to do so. Health services can be used as an illustration. They are usually traded by the patient moving to the supplier, for instance to have an operation performed in a hospital abroad. While it may be worthwhile for the patient to move for an important operation it is unlikely for a benign complaint for which local treatment will be sought.

Gini Coefficient

λ_r^s is the share of sector *s* in the region *r* in terms of employment;

ID_r^s is the share of the demand of sector *s* in the region *r*.

To calculate the relative Gini coefficient, regions must be ranked according to the relationship between local employment and local demand (λ_r^s / ID_r^s). Then

$$\lambda_{r(n)}^s = \sum_{r=1}^{n} \lambda_r^s$$

is defined as the cumulative distribution of the share of employment of the sector *s* in the first *n* regions and

$$ID_{r(n)}^s = \sum_{r=1}^{n} ID_r^s$$

the cumulative distribution of the indices of demand for the sector *s* in the first *n* regions. The relative Gini coefficient is then calculated as:

$$G_{rel}^s = 1 - \sum_{n=1}^{R} \left[\lambda_{r(n+1)}^s - \lambda_{r(n)}^s\right] \left[ID_{r(n)}^s + ID_{r(n+1)}^s\right]$$

When there is the same distribution between employment of the sector *s* and its demand, the Gini coefficient takes the value of 0. If, however, the distribution of employment of the sector *s* becomes more concentrated than the distribution of its demand, the value of the Gini coefficient increases. In the situation in which all of employment in the sector s were to be concentrated in one region but demand was localised in other regions, the Gini coefficient takes the value of 1. The higher the Gini coefficient the more geographically concentrated is a service relative to its demand.

Source: Barlet et al. (2010)

In order to calculate the degree of concentration, a suitable geographic unit needs to be selected. In the case of the French study by Barlet et al. (2010) the unit of analysis is the travel-to-work area, which appears appropriate. Suitable measures of production and demand need also to be selected. The French study uses the distribution of employment in services for production. Similar to Jensen and Kletzer, it uses input-output tables for intermediate consumption to calculate derived demand of enterprises and the share of each service in the final demand of households weighted by the population and median income of a region for local final demand. As is now standard, the Gini coefficient is used to measure relative concentration of a service compared to demand as set out in the box.

Using the results of the French study we can develop a list of different categories of services that are traded domestically ranked from highest to lowest (Table 1-2). All of the existing studies using the methodology of Jesen and Kletzer use national data and national indices of concentration. As a result Gini coefficients are not directly comparable but the rankings of services can be compared across the different studies.

Table 1-2 Domestic trade of different types of services

Most traded **First Quartile** **Gini >0.3**	**More traded** **Second Quartile** **Gini ≥0.21 & <0.3**	**Less traded** **Third Quartile** **Gini >0.5 & ≤0.21**	**Least traded** **Fourth Quartile** **Gini <0.15**
Air transport	Auxiliary transport services	Cultural, recreational and sporting activities	Wholesale trade
R&D	Travel Agencies	Hotels & restaurants	Postal & Telecommunications
Transport by rail	Employment agencies	Waste management	Public administration
Insurance	Non-profit associations	Real estate	Social services
Audio-visual services	Holding companies	Auxiliary financial and insurance services	Health care
Water transport	Professional services	Rental & leasing activities	Trade and repair of motor vehicles
Computer services	Financial intermediation	Other business services	Retail distribution
Organisation of freight transport	Passenger land transport	Freight transport by road	Education
Advertising & market research	Renting of accommodation	Architecture and engineering services	Personal services to households

Source: Barlet et al (2010)

There are a number of advantages in using the study of Barlet et al. as a reference for the degree to which services are traded domestically. The distribution of services in France is quite similar to that for the EU as a whole. This should not be surprising since as one of the EU members with the largest economy all services are present to a

considerable degree. Furthermore with the largest area in the EU, the country also has several metropolitan conurbations, many large towns, a dense network of medium sized towns and areas also of very low density that facilitate an analysis of concentration. Results are available for a large number of services using an identical activity classification to the one used later for measuring trade. Finally the results appear plausible when compared to those for those of the three Nordic countries. Comparisons with the results of Jensen and Kletzer for the US are rendered more difficult because of differences in the activity classification and size of geographic reference area but where comparisons are possible they tend to concord.

Implicitly all the work using countries as reference markets or co-location of demand and supply are using trade as a measure of integration while conceptually as previously argued it should be treated as a means to achieve market integration and not as a measure of integration per se. Increased trade is expected to result from efforts to implement a Single European Market for goods, services, capital and labour as well as opening up to third countries through the GATS and bilateral agreements. As a first pass therefore it measures the extent to which the SMP has succeeded in its initial objective. As a second pass and to the extent that actual trade is necessary to credibly affect competition within Member States, it can be used as an indicator of whether the SMP is likely to have led to such an increase in competition.

Missing trade is a good measure of the potential for increased trade. It has a number of advantages over the other possible measures mentioned. It can be applied to different geographic and product levels of disaggregation. It can be used to measure developments over time as well as levels at a given point of time. It is flexible to the definition of trade and can be extended to include permanent presence as well as cross-border trade.

Missing trade measures the potential for increased trade by comparing the observed amount with the expected trade under frictionless conditions. It therefore comprises two elements, the measurement of the observed amount of trade – which is related to openness to trade – and the comparison with a suitable reference. For services, establishing a suitable reference has proved problematic in the past. The recent work on domestic trade provides a reference of which services one might expect to be traded cross-border. It is a relative measure in the sense that services that are more or less

traded domestically can be compared with those services that are more or less traded cross-border. As such it provides an easy method of identifying for which services missing trade is most apparent.

Services that are traded domestically should also be able to be traded cross-border. The more a service is traded domestically the higher the expected level of imports. The relationship between domestic trade and imports of services is expected to be positive.

Services that are little traded domestically can still be served by firms setting up foreign subsidiaries in the country concerned, for instance to serve local markets. It would be expected that inward FDI would predominate for those services that are little traded domestically. The relationship between domestic trade and sales of foreign affiliates is expected to be negative.

Measuring the observed amount of trade relative to the total market in order to compare with domestic trade turns out to be anything but straightforward. At least three elements are involved. The first requirement is a definition of trade that is both conceptually sound and therefore covers permanent presence in addition to cross-border trade. The second is that it must be statistically measurable in a comparable fashion across sectors, across countries and across time. The third is the operationalization of the definition in terms of the data required and the calculations to be performed.

We need to measure trade in a coherent fashion that allows comparisons between the levels achieved for services compared with goods as well as between the different types of service, irrespective of the manner in which they are traded. This means that the definition of trade employed must be similar for both, in line with internationally agreed norms and cover the different forms through which trade actually takes place. An obvious starting point is the market. How big are the markets? What are their characteristics? This constitutes the denominator to which an appropriate indicator for the numerator can be applied to arrive at a measure of observed trade that is comparable across time, sectors of activity and countries.

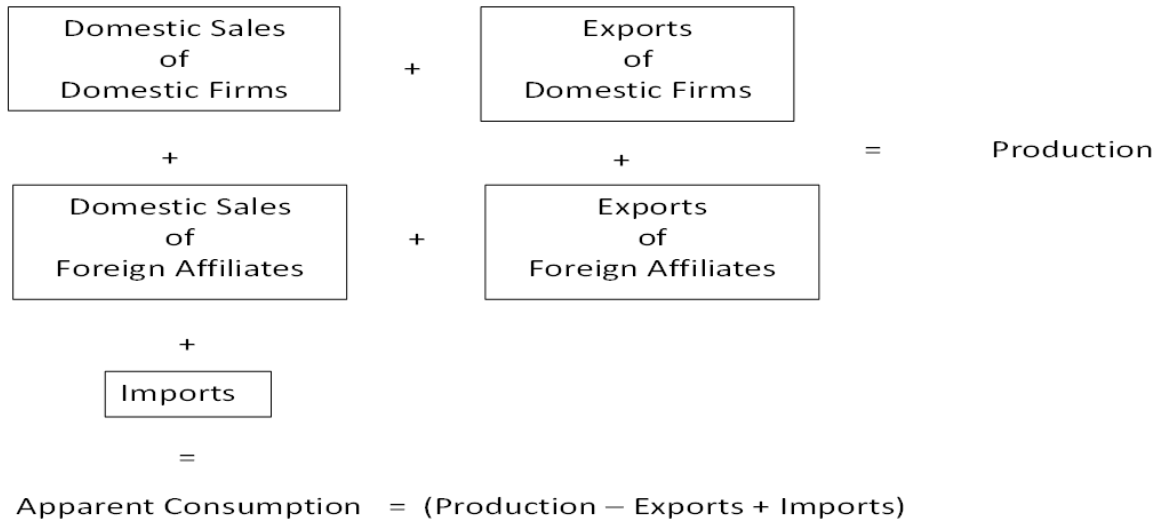
One key requirement is for consistency in the unit of measurement between the different variables. The approach adopted therefore is to standardize around turnover as a measure of sales that is most comparable to the figures for trade. It would be desirable to have comprehensive, comparable and up-to-date data on market size for

different activities drawn directly from the market, in the way for instance market research firms such as Nielsen collect data on retail sales. Instead an indirect approach, commonly applied in the trade literature is applied. Apparent consumption is calculated as production minus net exports:

$$\textit{Apparent Consumption} = \textit{Production on the domestic territory} - \textit{exports} + \textit{imports}$$
$$= \textit{Turnover} - X + I$$

The different elements required for estimating trade are illustrated in:

Figure 1-2 Building Blocks for Measuring Trade



These building blocks must then be put together to calculate market penetration defined as:

$$\textit{Market Penetration} = \frac{\textit{Domestic Sales of Foreign Affiliates} + \textit{Imports}}{\textit{Apparent Consumption}}$$

Market penetration measures the degree to which markets are served by foreign suppliers, irrespective of the mode of supply. It is a measure of openness to trade. There are two elements to market penetration. The ratio between Imports and Apparent Consumption is commonly known as import penetration and this term will be used here. The ratio between Domestic Sales of Foreign Affiliates and Apparent

Consumption has no established terminology but by analogy with import penetration it will be called foreign affiliate penetration or FAP.

1.4 **Data**

The data requirements for these different building blocks are quite extensive. When estimating the different elements, three types of problem have been encountered: problems with the availability of data, problems with the quality of the underlying data and problems with the compatibility of different data sources. Together they reduce the overall quality of the estimates and introduce potentially significant bias.

2008 is the first year for which sufficient data became available to make the necessary calculations. It should be mentioned that such data, particularly the FATS element, becomes available with a considerable time lag so that it is not possible to provide the type of estimates presented here for very recent data. This is the price to pay for coherence and comprehensiveness of the estimates. In terms of the business cycle, for most EU countries 2008 was the final year before the onset of the financial crisis and great recession. As such it represents a convenient benchmark. Subsequent work should update these estimates which would allow comparisons to be made for developments over time, which has not proved possible here.

Four different data sources have been employed in order to make the estimates of observed trade. They are first Eurostat structural business statistics (SBS) which contain activity based data for all enterprises and separately for foreign controlled EU enterprises - inward FATS. Data on trade in goods comes from Comtrade and that on services from EBOPS. Limited use is also made of input-output tables.

Structural business statistics cover NACE Rev. 2 Sections B to N and Division 95, which include industry, construction and many commercial services, with the exception of financial and social services and public administration. Nor do the SBS cover agriculture, forestry and fishing. Availability of data under the SBS conditions the services for which it is possible to make estimates. The estimates do cover the great majority of the economic activity that can be considered to have been the subject of market liberalization measures within the EU or with third countries with the exception of agriculture, energy and water.

By presenting the results on a disaggregated basis, sector by sector, the issue of which sectors constitute a service can be left to the reader. For example, construction is included in the estimates as a service because it is the subject of international negotiations on services under the GATS and as a service under the European Single Market under the Services Directive and also with specific provisions for public procurement under the Public Works Directive. Manufacturing is presented as a single sector for purposes of comparison with services. The justification is that much of the literature on trade and foreign direct investment has been based around goods and that the literature on services makes reference to the differences between goods and services. It is not meant to imply that observed levels of trade in services should approach those in manufacturing.

There are three major limitations to the SBS data for the purpose of this exercise. The first is that FATS data is not available for all countries. In practice this means that the EU estimates have to be built up on the basis of the 18 available individual country figures rather than from the EU total. Countries lacking are Belgium, Estonia, Ireland, Greece, Latvia, Lithuania, Luxembourg, Malta and Romania. The absence of some of these countries has more serious consequences than for others. Belgium as one of the most open countries in the EU and one with significant inward foreign direct investment obviously represents a serious loss. In terms of cross-border trade the loss of Ireland with its sizeable trade in IT and business services is significant as would have been Luxembourg if the estimates had covered financial services. Greece and Malta are significant contributors to travel and tourism. Overall therefore the coverage of the estimates is high in terms of EU GDP but less so in terms of trade in services (table 1-3).

Table 1-3 Coverage of the estimates

Variable	*Total Economy*	*Total business economy except financial and insurance activities*	*Total Goods*	*Total Services (except financial and insurance activities and public administration)*
Exports	87.2%	86.5%	87.4%	82.9%
Imports	86.6%	85.9%	86.6%	82.5%
Value Added	91.9%	92.0%	92.2%	91.9%

A second limitation to the SBS data lies in the fact that the domestic share of turnover is not presented separately and must be obtained by subtraction of the turnover of foreign affiliates from the turnover of all enterprises. Since the coverage of the FATS data is not as complete as that for the total of all enterprises under reporting and missing data will show up as a misrepresentation of the turnover from domestic firms. Unfortunately, the SBS provides no data on exports of firms, even on an aggregate basis per firm. This means that the relative contribution to exports of goods and services of domestic and foreign affiliates cannot be established and must be attributed on a pro rata basis.

Quality represents a concern for trade data – more so for services than for goods. A number of issues relate to both goods and services while some are specific to services. Since the abolition of internal borders in the EU's internal market, the same type of source is employed for measuring intra-EU trade in goods as for both intra and extra-EU trade in services (Eurostat 2006, 2008). In addition to the discrepancy between types of source, different thresholds apply to reporting for extra and intra EU trade for goods, leading to an underestimation of intra compared to extra-EU trade. Among the problems that primarily affect the measurement of trade in goods but can also affect services is where flows across borders and ownership change are not coincident. The phenomenon of re-exports is quite well known particularly for countries such as the Netherlands and Belgium, with their substantial through trades from the ports of Rotterdam and Antwerp, and for city states such as Singapore and Hong Kong with their substantial entrepôt trade (Mellens, Noordman & Verbruggen, 2007).

The issue of re-exports is particularly significant because it affects import penetration. The measure of market size as apparent consumption (the denominator) should be relatively little affected because only net exports enter into the calculation. However, imports enter into the numerator and as such strongly influence the results. In order to arrive at a realistic measure of import penetration, trade data has to be corrected for the effects of re-exports and that requires both a realistic measure and a comparable data source for EU Member States. From the use table for imports it is possible to derive a value of re-exports as imports for the purpose of exports. The procedure adopted here is to adjust total imports for re-exports only where the share of re-exports in total imports for the country concerned exceeds 10%, but the breakdown between

intra and extra-EU imports is done on the basis of total imports, thus introducing a potential source of bias. The reason for this is that re-exports are measured with imprecision and that revising the overall import figures may induce further bias.

Goods, particularly manufacturing, are much more affected by re-exports than services and certain countries are very much affected while others scarcely at all. Overall EU import penetration for manufactures is 4.8% lower after adjustment for re-exports and much lower for individual countries (9.1% for Germany, 11.3% for Austria, 11.8% for Denmark and a huge 44.9% for the Netherlands). For services the impact is insignificant at EU level and only significant at the level of individual types of services at country level (less than 5% for transportation for Denmark and Austria, and for information and communication for the Netherlands and Hungary).

Re-exports are not the only issue to affect the quality of the estimates. While we have more detail on services under the most recent classifications, we still have less detail than for manufacturing activities. Incompatibility between the product classification used for trade in services and the activity classification for domestic and FATS operations constitutes a major headache.

For the purpose of this exercise, imports and exports for services from the EBOPS must be matched with the turnover data for enterprises and foreign affiliates collected under the SBS. Trade data relates to products while that for enterprises relates to activities. Because the product classification for trade in services and that for activities are not fully aligned, problems of matching arise. Of particular concern is the category “travel”, which has no counterpart in the activity classifications. Persons travelling abroad consume a variety of services (and goods). Attributing all of the category “travel” to activities such as “accommodation” or travel agencies is therefore likely to produce a hefty overestimate of the importance of cross-border trade to these activities. Indeed such an attribution in the context of this exercise yields a figure of 44% for cross-border trade as a percentage of apparent consumption of “accommodation plus travel agencies”, which is clearly far too high.

Both the problems of articulation between products and activities and matching of trade with activity based data are faced by national authorities and Eurostat when producing input-output tables. They have therefore developed procedures for dealing with the

problem. Eurostat kindly provided correspondence tables between the breakdowns of trade in services under EBOPS with the NACE Rev2 classification used for the SBS data on turnover. These correspondence tables were applied in order to attribute the individual posts of services' trade to activities.

Data for both FATS and trade in services is incomplete for certain of the eighteen countries selected, particularly at the level of the disaggregation between intra and extra-EU trade and sales of foreign affiliates. The procedure followed has been first to calculate overall import penetration and sales of foreign affiliates. For the EU, the breakdown between intra and extra-EU imports and foreign affiliate turnover has been apportioned according to the shares of those countries for which data is available. This implies that the breakdown is less reliable than the figures for overall levels and less so for the more disaggregated figures for individual services than for the more aggregated categories of services. At national level the breakdown between intra and extra-EU data was insufficiently reliable to provide accurate figures and the results of the national exercise are available at aggregate levels only. The amount of sectoral disaggregation available is also less detailed than for the EU.

Before presenting the empirical results in the next section, it would be as well to be clear about the nature of the comparisons that are being made. The level of observed trade in any given sector needs to be assessed against potential for that sector rather than against other sectors. Combining the information in tables one and two with that on the literature on FDI, it can be expected that the share of cross-border trade will be higher either when the service can be traded directly cross-border or where multiple forms of cross-border trade are possible. Where trade requires either the supplier or the user to move countries this would be considered as a burden of proximity tending to depress cross-border trade and encourage commercial presence. Commercial presence is also likely to be the preferred form of trade for those services in which demand conditions require that production takes place close to the user because of the repetitive nature of purchases, a requirement for strong interaction between provider and client, oligopolistic market structures discouraging import penetration or cultural factors that require that the service be adapted to the needs of the specific market.

Expectations of low cross-border trade in services are subject to one significant caveat. There are numerous local and regional markets in Europe which may not correspond to national borders. Thus 35% of the EU's population resides in an area immediately adjacent to an internal border with a combined GDP of €3.4 billion. In the absence of any form of physical border, there is no reason in principle why such areas should not give rise to substantial cross-border local purchases of services. A parallel can be drawn with the US where local inter-state borders have limited impact on most purchasing decisions.

1.5 EU Markets for Goods and Services

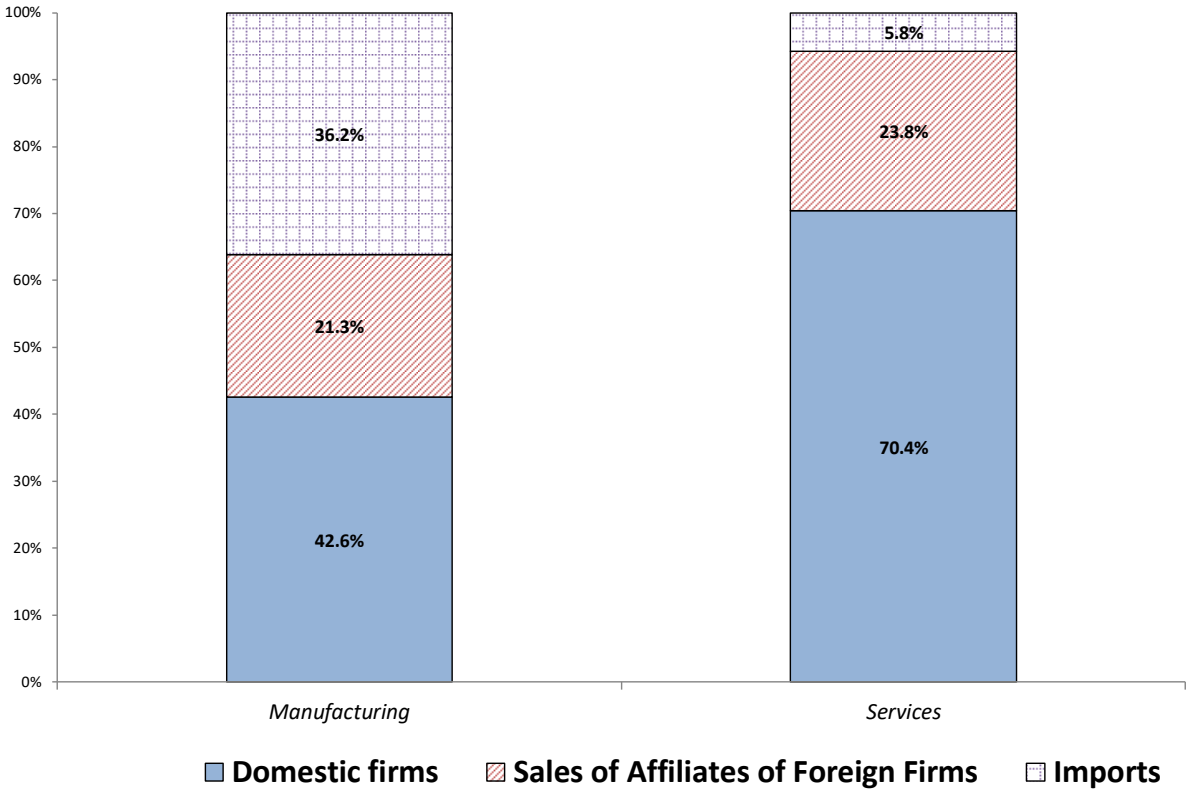
This section presents the results of the estimation exercise for the 18 countries for 2008 described in the previous section and compares the results with what would be expected on the basis of the relative levels of domestic trade for these services. These estimates have the merit of presenting for the first time a consistent picture related to the most fundamental variable for analysis of the EU Single Market, the size of market itself. They provide an overview of the degree to which markets are served by both EU and non-EU suppliers. It is the sum of import penetration and the penetration of sales of foreign affiliates on the domestic market.

As could be expected from the literature on trade and foreign investment, manufacturing presents a starkly different picture from services in both levels and form of trade. Just over two fifths of manufactured goods are supplied by domestic firms. Trade for manufacturing mainly takes the form of imports, which supply over one third of the market, although sales of foreign affiliates are also important supplying around one fifth of the market (fig. 1-3). EU Member States import nearly two and a half times as much manufactured goods from within the EU as from outside while foreign affiliates of non-EU originated firms contribute almost as much as those from within the EU.

Levels of trade for services are much lower than for goods although considerably higher than would be expected from measures of openness to trade that do not include sales of foreign affiliates. Domestic firms supply just over 70% of the market, while sales of foreign affiliates supply almost a quarter of the market and imports less than 6%. There is little difference between intra and extra-EU imports, although both are very low. Compared to manufacturing, sales of EU-originated foreign affiliates are relatively more significant than those from third countries. The preferred form of supply

for EU firms on the Single Market is therefore through right of establishment rather than by freedom to provide services. The very low level of imports compared to sales of foreign affiliates might suggest that imports are likely to be the main source of missing trade, but this needs to be confirmed by the confrontation with the level of domestic trade.

Figure 1-3 Overall Markets for Goods and Services by Type of Supplier

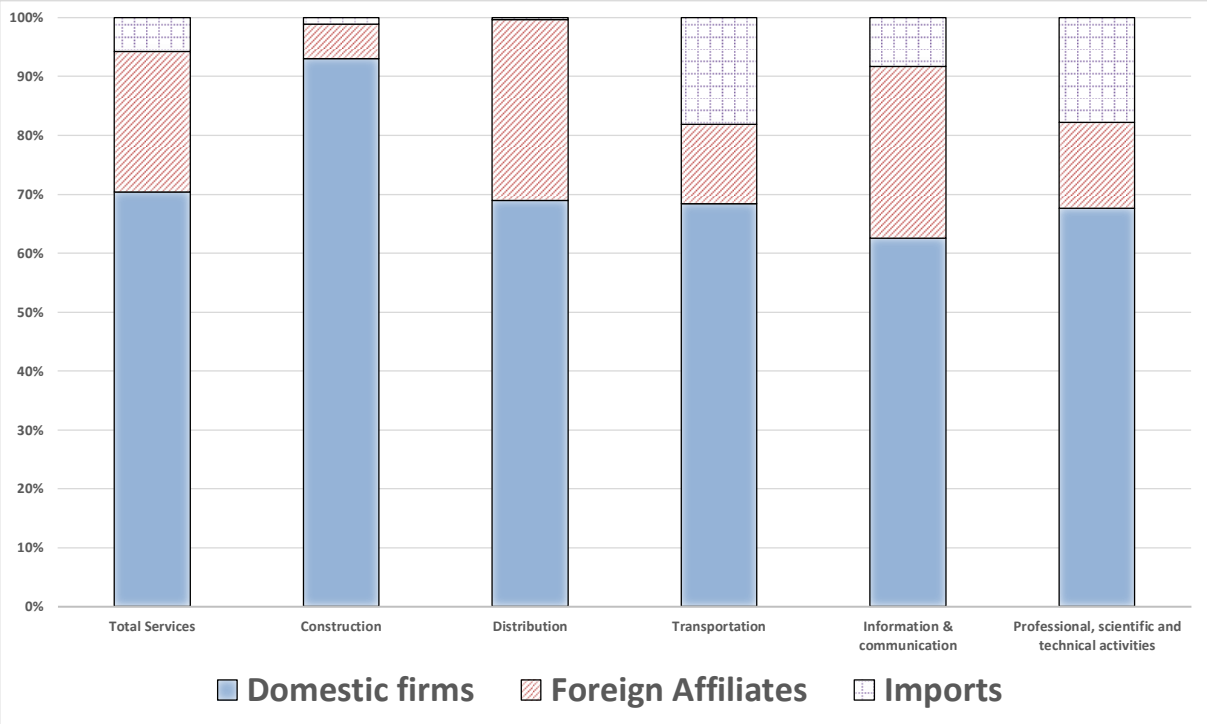


Source of supply for the major types of service are provided in fig. 1-4. Since the heterogeneous nature and characteristics of services would leads us to expect widely different levels and patterns of trade for different services, an overall measure for services is not particularly meaningful. Remarkable in the first instance is how little the share of domestic producers varies across sectors. Only information and communication have significantly higher market penetration than average while construction is almost entirely served by domestic firms. Intra-EU imports and sales of EU affiliates in each case exceed those from third countries.

The figure for construction should not surprise. The sector is dominated by small firms serving a local market and cross-border trade is constrained by the requirement for the supplier to provide the service on the premises of the user. Anecdotal evidence would

suggest that there are large numbers of small construction firms from other EU countries operating officially or unofficially on EU markets. Because surveys of FDI concentrate on large firms it may be that sales of foreign affiliates for construction go under-reported and that the real share of domestic firms is lower. Public works, representing about one fifth of the sector and where major international firms such as Bouygues in Europe or Bechtel in the US are active, would likely to be more open to cross-border trade.

Figure 1-4 Markets for Major Services by Type of Supplier



From the measure of domestic trade we should not expect much cross-border trade in distribution and rather that trade where it takes place would be via permanent presence, which proves to be the case. Of course the distribution sector plays a major role in trade in goods, which is not being measured here. However, the development of e-commerce allows the distribution sector to provide both goods and services cross-border[2].

As would be expected from the high level of domestic trade, import penetration for transport is higher than penetration by sales of foreign affiliates. However unexpectedly the combined level of level of import penetration and FAP is no higher than average.

[2] E commerce is the subject of Chapter 4

For information and communication it is the predominance of trade through commercial presence that is unexpected.

Figure 1-5 Imports and Sales of Affiliates of Foreign Firms as % of Apparent Consumption

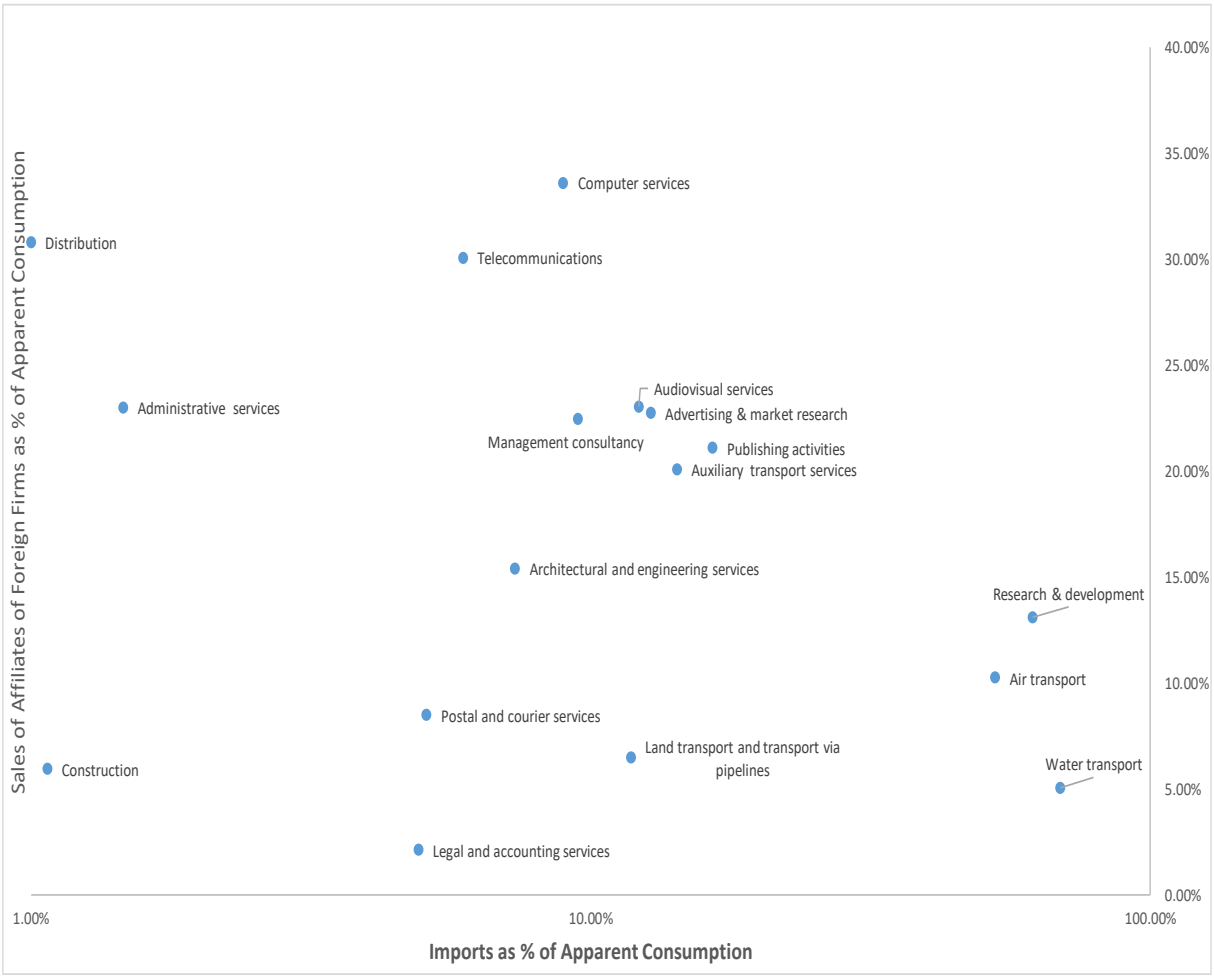
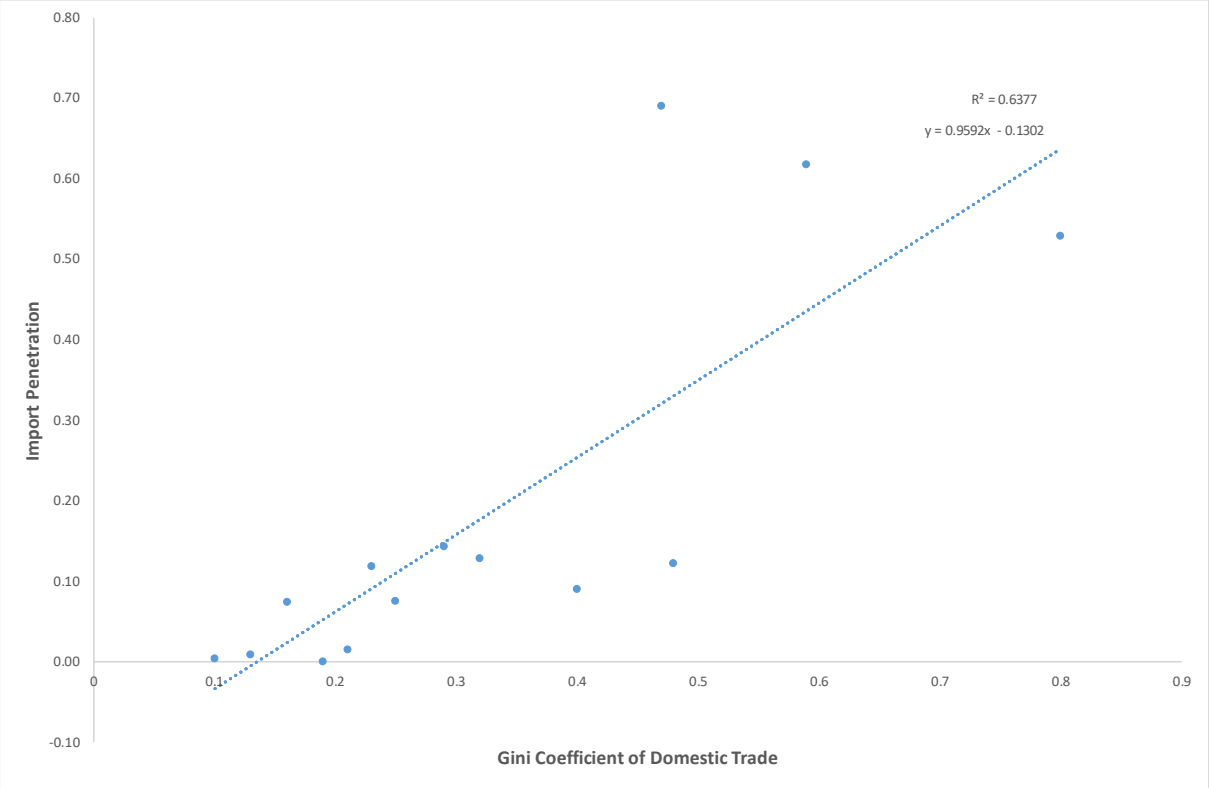


Figure 1-5 looks at market shares separately for commercial presence and cross-border trade at a more disaggregated sectoral level. In order to differentiate sufficiently individual sectors, the horizontal axis denoting imports as a percent of apparent consumption is on a log scale.

Air and water transport and R&D are sectors which trade essentially cross-border rather than through permanent presence. They also have the highest level of overall market penetration, comparable to and even exceeding the average for manufacturing. At the other extreme distribution and administrative services like office cleaning are supplied from abroad by sales of foreign affiliates rather than by imports. Knowledge intensive business and communications services have some imports but trade is mainly through sales of foreign affiliates.

Figure 1-6 Import Penetration and Domestic Trade



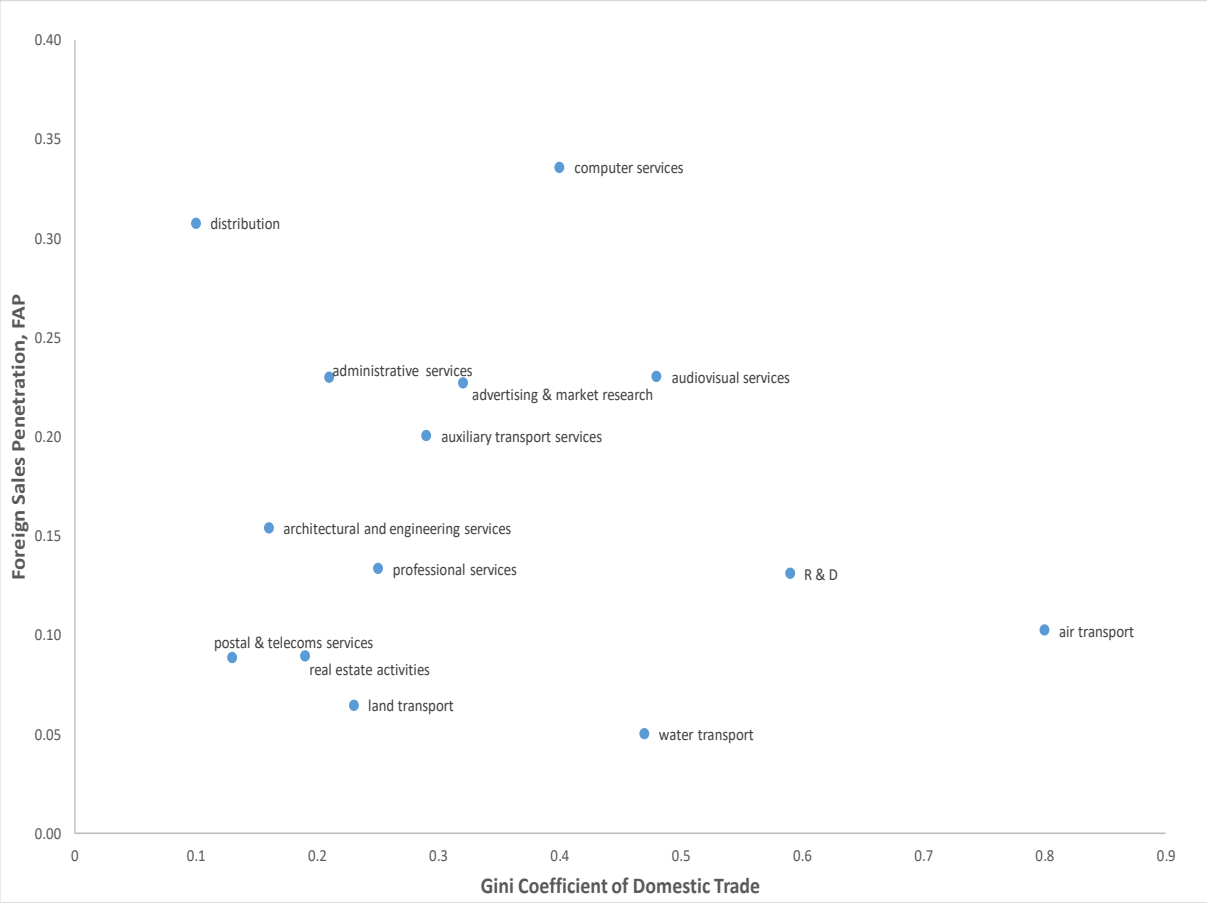
As developed in section 3, in order to identify missing trade, realised outcomes need to be compared with expected outcomes based on the degree to which services are traded domestically. Fig. 1-6 compares import penetration with the Gini coefficients for domestic trade as set out in Table 1-2. Import penetration is expected to be higher for those services that are more traded domestically. The relationship is positive with an R^2 of 0.6377 indicating that a linear relationship is a reasonable fit. Two outliers are computer services and audiovisual services which have lower levels of import penetration than would be predicted from their levels of domestic trade.

Likewise, fig. 1-7 compares foreign affiliate penetration, FAP, with the same Gini coefficients for domestic trade. There is no overall pattern to the relationship between FAP and domestic trade. While a linear estimation produces a negative slope as expected, the coefficient is very small and the R^2 is very low at 0.0231 indicating a poor fit.

Certain services do behave as expected. Distribution and administrative services are served through sales of foreign affiliates and air and water transport and R & D have high levels of import penetration and low levels of FAP. Computer and audiovisual

services clearly do not behave as expected. They have higher levels of FAP and lower levels of import penetration than would be predicted by their levels of domestic trade.

Figure 1-7 Foreign Sales Penetration and Domestic Trade



Three services, postal and telecommunications, real estate and land transport have clearly lower levels of FAP than would be expected. The Gini coefficient for domestic trade for post and telecommunications is only available for the two combined. The more disaggregated data in fig. 1-5 shows that telecommunications have a much higher FAP than postal services. Similarly, among professional services management consultancy has much higher FAP than legal and accountancy services, which are heavily regulated. For land transport, the low value is clearly dominated by freight transport by road rather than by rail or passenger transport.

It would appear that certain services particularly in the field of knowledge intensive business services and ICT for which higher import penetration would be expected are instead being served from abroad by foreign affiliates. Of course it is perfectly possible for a firm to trade services domestically by using a foreign affiliate in the country rather

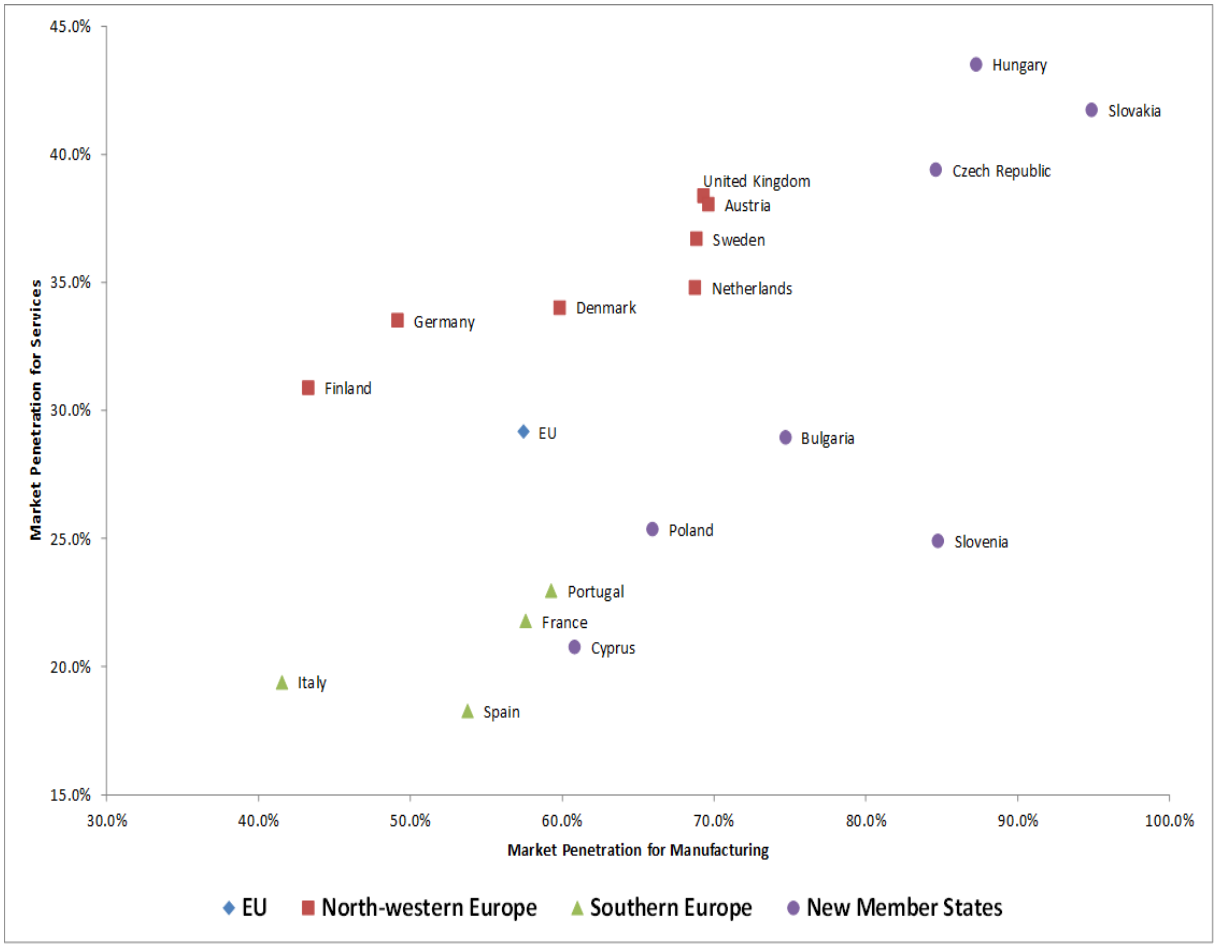
than through exports, even though the initial investment required is higher. As mentioned in section 2, the impact on competition is not the same and a higher level of import penetration compared to FAP might be preferred. The existence of specific obstacles to cross-border trade in the form of regulatory or non-regulatory barriers would appear a plausible explanation for the preference for serving markets through foreign affiliates. The overall positive relationship between the degree to which services are traded domestically and openness to international trade would not point to substantial overall missing trade in services. Rather it is the form of trade with less import penetration than would be expected which appears as missing in the case of some services. From the evidence presented it is not possible to establish whether the 30% share of market penetration for several services represents some form of natural barrier or not. Technology is making services easier to trade both domestically and internationally. It would be important to know to what extent services have become more traded recently both domestically and internationally in order to answer that question.

Country level estimates for overall market penetration (import penetration plus FAP) in 2008 using data elaborated in the same way as for the breakdown by type of service add an additional dimension to the previous analysis of EU markets for services. Traditional measures of openness show much higher levels for small countries compared to larger ones. With these estimates we can look at this in greater detail for services compared to manufacturing and for different types of service.

As expected, we see a major difference in levels of market penetration between manufacturing and services for individual countries similar to the difference observed for the EU as a whole (fig. 1-8). Countries are always less open to trade (imports and sales of foreign affiliates combined) for services than for manufacturing. A number of country groups stand out. Southern European countries including France and Cyprus have very low levels of market penetration for services. Northern European countries have higher levels for services, less so for manufacturing. New Member States with the exception of Poland and Cyprus exhibit very high levels of market penetration for manufacturing, which in view of the recent nature of their accession to the EU is surprising. Indeed, Czech Republic, Slovakia and Hungary exhibit extraordinarily high levels of foreign market penetration for both manufacturing and services, well in excess

of the most open of the northern European countries (United Kingdom, Austria, Sweden and the Netherlands).

Figure 1-8 Market Penetration for Manufacturing and Services by Country, 2008



As far as services are concerned, trade has been driven by permanent presence rather than by cross-border trade, particularly for the distribution sector. North-western countries in Europe are something of an exception with much higher levels of cross-border trade among Nordic countries (but still with a predominance of permanent presence). For the UK this pattern is reversed with a very low share of imports accompanied by a high share of sales of foreign affiliates (one third of the total market). There is some variation across sectors but still a remarkably constant pattern. For services a very high level of market penetration means that the combined market share of imports and sales of foreign affiliates reaches 40%. At the level of major service sectors we have five countries with more than 50% foreign market share in information and communication, two in transportation, one in professional services and none in distribution.

Differences between countries in the degree of openness to trade in services either cross-border or through permanent presence could indicate that domestic barriers to trade vary considerably within the EU. Both differences between the observed level of market penetration for a specific sector and that which would be expected on the basis of levels of its domestic trade and between countries within the EU for the same sector require an identification of the specific barriers which apply to that sector and how they can vary from country to country.

1.6 **Conclusion and Future Work**

The main contribution of this chapter is to present consistent, replicable and comparable estimates of EU markets for services, covering both cross-border trade and sales of foreign affiliates, at a disaggregated level across sectors and across countries. These estimates should be taken as a benchmark against which future developments in trade can be measured, particularly for those sectors which have recently been the subject of liberalisation under the Services Directive. When measuring trade particular attention should be devoted to the future balance between imports and permanent presence.

Imports rather than sales of foreign affiliates are identified as the main source of missing trade. Compared to high corresponding levels of domestic trade, import penetration is very low for a number of services concentrated among knowledge intensive business sectors with a high impact on the rest of the economy. These are the services for which relative observed levels of import penetration would be expected to be higher and constitute the main source of missing trade.

While the data for a single year provides a useful benchmark by which the degree to which efforts to liberalise markets in Europe have led to more trade, updating the current estimates to track developments over time is an important task for future work. Furthermore coverage needs to be extended so that it covers all EU Member States. Comparisons with other important markets for services, particularly the US would be useful but differences in classifications and data collection are likely to limit the possibilities for extending the methodology developed in this chapter beyond Europe.

The very different performance of individual services with regard to trade both from a theoretical and practical point of view illustrate the need to provide estimates at an

adequately disaggregated level. The estimates presented here suffer from a number of deficiencies relating to data availability, data quality and incompatibility between different sets of data. The accuracy of estimates could be improved through a better correspondence of the categories of EBOPS data on trade in services with the NACE categories used for SBS data on enterprises and by collecting data on exports directly from enterprises surveyed for the SBS. Large micro-based data sets of enterprises would allow better attribution of trade by activity, a proper ventilation of exports by type of supplier (domestic producer or foreign affiliate) and direct measurement of re-exports. Further research should adopt a fully integrated approach to trade by basing measurement on value added rather than apparent consumption.

Openness to trade for services remains low compared to manufacturing. The difference between manufacturing and services is even stronger for imports since sales by foreign affiliates are the main way in which services are traded in the EU. The degree of openness to trade in services varies not only between manufacturing and services and between different types of service but also across Member States. Northern Member States have higher levels of market penetration for services than those in the south.

The low observed level of trade for most services twenty-five years after the date initially set for completion of the EU internal market should already alert policy makers to the scale of efforts that are required if the original vision of a single integrated market is to be realised. The fact that trade in services overwhelmingly takes place through permanent presence rather than through cross-border trade has implications for the degree of effective competition which integration should bring. While increasing ease with which services can be traded via digital means brings opportunities for increased cross-border trade, domestic restraints on the way services are provided will need to be eased if this potential is to be realised.

Chapter 2.
THE CHOICE BETWEEN EXPORTS AND FDI IN SERVICES: PRODUCT, FIRM AND INDUSTRY DETERMINANTS

2.1 Introduction

The choice between serving markets either through exports or through setting up a local subsidiary has been studied more thoroughly for manufacturing than for services. There is a need for more work on the choice of market entry for services in particular because it is believed that this choice is more constrained by the nature of services than for goods. To what extent is the choice of entry mode 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 prefer to 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 chapter sets out to address.

The chapter starts from the proposition that decisions about how best to serve a market are taken at the level of the firm. Therefore in our chapter we provide insights on reasons for the low level of cross-border trade 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. 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 chapter from the firm to the service that is traded.

Starting from the perspective of the firm, we first model the decision of the firm whether or not to internationalise its sales of services. This allows us to investigate in a second stage how the same factors may affect the choice between exports and FDI. If firms consider that the obstacles to trade in services are too high, they will abstain from entering foreign markets. Trade will then be missing because of non-participation. In the second stage we move from a focus on the firm to one based on the services themselves and the attributes of the service being traded, while still controlling for firm and industry specific aspects.

In order to model the choice of entry mode we use the share of sales of foreign affiliates in total foreign sales of a service as the dependent variable[3]. By measuring this at the level of the individual service we implicitly include only horizontal foreign direct investment. This is also in line with current literature (Oldenski, 2012).

This chapter contributes to the literature in three ways. First it covers even the smallest firms including those with only the self-employed 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 entry mode between direct exports and sales through a foreign affiliate.

The next section reviews the relevant literature on the internationalisation of service firms and the chosen entry method. Section 3 presents the data. Section 4 presents the characteristics of firms active on the international market, putting particular emphasis on size and age of firms as well as the industry in which they are active. Section 5 examines the selection of firms into internationalisation irrespective of whether that takes place through exports or sales of foreign subsidiaries. It then looks at the choice between the modes of internationalisation that is at the heart of the chapter. Section 6 concludes.

2.2 **Literature Review**

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 exports?" (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. A recent 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).

[3] Unfortunately data limitations mean that non-equity forms of internationalisation such as licensing and franchising could not be included in our choice of entry modes. Including non-equity forms of internationalisation would no doubt further increase the share of sales of foreign affiliates in total trade.

Similar to manufacturing firms, trade by services firms is associated with fixed costs of trade with the costs of importing lower than for exporting but with the costs of trading services larger than the costs of trading goods. As would be expected from the aggregate trade data, service firms 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 et al. 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 view of the considerable differences between manufacturing and services in the skills composition of the workforce, the impact of human capital on trade needs also to be tested for services (Contractor & Mudambi, 2008). In a study of 25 countries trading services, Contractor et al. 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. This is a much richer source but unfortunately poses problems for services. At least for extra-EU trade in goods, customs declarations provide a rich source of data on transactions. No such source exists for services although of course the transactions approach is equally applicable to them. 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, 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”. For services, the choice between different modes of internationalisation is more complicated to study than for goods. Cross-border trade in services takes place also 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).

Non-equity modes (NEMs) of international production, such as contract manufacturing, services outsourcing, contract farming, franchising, licensing and management contracts are particularly prevalent for services (UNCTAD, 2011). They are estimated to have generated over $2 trillion of sales in 2010. Contract manufacturing and services outsourcing accounted for $1.1–1.3 trillion, franchising $330–350 billion, licensing $340–360 billion, and management contracts around $100 billion. Unfortunately data on NEMs is too sparse to incorporate this form of internationalisation into empirical studies which in practice are limited to the choice between cross-border trade and FDI.

By 2015 about two thirds of global FDI stock was concentrated in the services sector up from just under 60% in 2001 (UNCTAD, 2017). It is not surprising therefore that FDI in services has now begun to receive more attention. 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 standard economics framework for FDI builds on that of Melitz for exports and is rooted in 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. 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. Therefore there is no reason why the standard framework for goods should necessarily apply also to services..

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.

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. 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. Recent work on FDI in services therefore looks to see what aspects of different services affect the firm's choice towards cross-border trade or commercial presence.

Various characteristics of services have been advanced to explain why FDI is so much more important for international trade in services than for goods. 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 requiring the presence of the provider 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 foreign entry, 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. in their value chain approach to service provision, the periods in which intensive provider-client interaction is required are generally quite short concentrated at the beginning and end of the project. 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. 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.

While models of exports versus FDI for goods emphasise the role of transport costs, for services the relevant costs are those associated with the transmission of information (Oldenski, 2012). In a simple model, 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 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. However, as with Ariu et al. 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. For the US between 1994 and 2004 for 54 manufacturing industries, 32 service industries and 88 countries, a one standard deviation increase in the importance of communicating with customers is found to reduce the export to FDI ratio by about 0.17 standard deviations, corresponding to a change in the ratio of exports to FDI of about -0.3.

While existing literature on trade in services has provided some interesting insights into why services are traded in a certain way in addition to who trades services, there remains a need for a somewhat more comprehensive approach as the one we offer. In particular we are able to integrate more directly service characteristics that underlie differences in the way that services are traded than is possible with the task approach, which is nevertheless complementary to the one taken here.

2.3 **Data**

Statistics on services have remained the Cinderella of public data gathering even though services made up around 80% of EU-28 output and employment in 2017. Structural business statistics (SBS) on services published by Eurostat now allow much better understanding of the major components of services even though they are much less detailed than those available for manufacturing. Similarly there have been improvements in the collection of data on cross border trade in services under the impetus of the General Agreement on Trade in Services (GATS) and the EU Single Market but they remain extremely poor compared with that which is available for goods.

The data on foreign direct investment, particularly Foreign Affiliate Trade in Services (FATS) data on the turnover of foreign affiliates remains fragmentary. Published data relates to country and either sector of activity in the case of SBS or FATS data or by product in the case of imports and exports of services. The availability of firm level data is much rarer – even when it constitutes the basis for published data - and usually restricted to either a set of balance sheet data or data on cross-border trade.

Services are very heterogeneous and aggregate data on services will disguise more than is illuminated. The need for very disaggregated data of course is at odds with the current state of data collection, particularly for trade in services. The large numbers of micro enterprises in services also pose a particular challenge for data collection. Applying a cut off point of firms with 20 employees, as is common for instance in studies of trade in goods, will eliminate most service firms and even very many of those that trade in services. Services firms with only the self-employed are prevalent in many services, including high level professional service firms where they may also be engaging in trade. Even restricting data to a single employee would be too restrictive in these cases.

Looking at the choice between exports and FDI at firm level 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 chapter 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. As a result, the Belgian micro data on trade in services covers mainly services sold B2B rather than B2C (air transport, audio-visual and cultural and recreational services are exceptions). With these limitations the Belgian micro data sets contain all the necessary data covering all firms in Belgium that are incorporated, including the self-employed. Many self-employed businesses choose to incorporate for fiscal or other reasons under a variety of legal forms that are well adapted to their needs. Non-incorporated self-employed are excluded. Unfortunately, these data sets are only available for the period 1997 to 2005.

2.4 **Characteristics of Firms that Trade 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. For that reason the average of all firms can serve also as a benchmark since it covers overwhelmingly domestic firms. Over ninety percent of all service firms have less than 10 employees and these represent over a half of service exporters (table 2-1). While firms with no employees (so only self-employed) make up over half of all service firms, they represent only 17% of exporters. Firms with 1-9 employees represent a similar share of exporters as they do of service firms in general (34% compared to 37%). Differences with regard to age are more marked with firms twenty years old or more representing a higher share in exporters than overall and young firms of ten years or less a lower share. The very large numbers of 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 shows that the low share of exports in total trade cannot be attributed to non-participation.

For reasons of confidentiality, the statistics on Belgian firms with foreign affiliates is more aggregated. Young and small firms dominate. 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.

Table 2-1 Share of all firms, service exporters and firms with service foreign affiliates by size and age

All firms

	0-5 years old	>5-10 years old	>10-20 years old	>20-50 years old	>50 years old	Total
0 employees	20.83%	14.33%	13.93%	3.45%	0.19%	52.73%
1-9 employees	11.32%	9.58%	11.14%	4.60%	0.22%	36.87%
10-19 employees	0.73%	0.93%	1.47%	1.14%	0.08%	4.36%
20-49 employees	0.45%	0.64%	1.21%	1.20%	0.13%	3.63%
50-249 employees	0.22%	0.29%	0.55%	0.69%	0.11%	1.86%
250+ employees	0.05%	0.07%	0.14%	0.21%	0.08%	0.55%
Total	33.61%	25.84%	28.44%	11.31%	0.80%	100.00%

Exporters

	0-5 years old	>5-10 years old	>10-20 years old	>20-50 years old	>50 years old	Total
0 employees	7.11%	4.28%	4.11%	1.44%	0.32%	17.26%
1-9 employees	9.70%	8.60%	10.21%	5.08%	0.48%	34.07%
10-19 employees	2.22%	3.01%	4.61%	3.73%	0.35%	13.91%
20-49 employees	2.03%	3.00%	6.03%	6.00%	0.71%	17.78%
50-249 employees	1.37%	1.91%	3.84%	4.94%	0.86%	12.92%
250+ employees	0.28%	0.53%	0.98%	1.70%	0.57%	4.05%
Total	22.72%	21.33%	29.77%	22.88%	3.29%	100.00%

Firms with foreign affiliates

	<20 years old	>20-50 years old	>50 years old	Total
0-19 employees	29.42%	11.66%	1.48%	42.60%
20-49 employees	6.15%	6.73%	1.62%	14.50%
50-249 employees	12.08%	10.35%	3.47%	25.90%
250+ employees	5.30%	7.46%	4.24%	17.00%
Total	53.00%	36.20%	10.80%	100.00%

The distribution in export sales shows a stronger concentration (table 2-2). Firms of between 10 and 50 years of age account for a majority of service exports. Very young and the oldest firms are less important in terms of values. As expected the largest firms with fifty or more employees account for over half of exports of services (57%). The share of exports begins to rise with the category of 20-49 employees.

44% of the sales of foreign affiliates by parent firms located in Belgium are made by young firms, with sales almost equally divided between the smallest and largest categories. Nearly three quarters of the sales of foreign affiliates by firms of less than twenty employees are by firms less than twenty years old while nearly two thirds of sales by foreign affiliates by firms over 250 employees are by firms over fifty years old. Firms between 20 and 249 employees play a lesser role. We see here a highly polarised structure of FDI with old established firms that have traditionally internationalised via FDI completed by small young firms that are just beginning to internationalise via FDI.

Table 2-2 Distribution of exports and sales of foreign affiliates by size and age

Exports	0-5 years old	>5-10 years old	>10-20 years old	>20-50 years old	>50 years old	Total
0 employees	2.32%	1.76%	1.64%	2.50%	0.28%	8.50%
1-9 employees	2.26%	1.71%	2.84%	2.57%	0.33%	9.70%
10-19 employees	1.42%	1.49%	2.09%	2.06%	0.51%	7.60%
20-49 employees	1.24%	2.61%	6.81%	4.91%	1.57%	17.20%
50-249 employees	2.70%	3.14%	8.31%	9.07%	2.17%	25.40%
250+ employees	1.77%	5.30%	6.12%	10.59%	7.84%	31.60%
Total	11.70%	16.00%	27.80%	31.70%	12.70%	100.00%

Sales of foreign affiliates	<20 years old	>20-50 years old	>50 years old	Total
0-19 employees	29.41%	9.50%	1.47%	40.40%
20-49 employees	1.97%	3.40%	0.32%	5.70%
50-249 employees	5.59%	3.69%	3.86%	13.20%
250+ employees	6.73%	7.70%	26.22%	40.70%
Total	43.70%	24.30%	31.90%	100.00%

Trade in services by Belgian firms during the period covered by this data was heavily concentrated within the then European Economic Area[4] (EEA) with 74% of exports and 96% of sales of foreign affiliates going to those countries.

This chapter uses the share of sales of foreign affiliates in total trade at firm level to model the choice between exports and local presence. It is therefore interesting to look at how Belgium performs in aggregate on this measure (table 2-3). Overall exports represent 44% of total trade and sales of foreign affiliates 56% so the two are quite balanced. 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 and largest firms, sales through a local presence is the preferred form of internationalisation.

Table 2-3 Share of sales of foreign affiliates in total trade in services by size and age

	<20 years old	>20-50 years old	>50 years old	Total
0-19 employees	68.0%	62.7%	62.6%	66.5%
20-49 employees	18.8%	46.6%	21.1%	29.5%
50-249 employees	33.4%	34.0%	69.2%	39.6%
250+ employees	39.3%	48.0%	80.8%	61.9%
Total	49.9%	49.2%	76.0%	55.8%

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, table 2-4 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. They dominate the smallest size

[4] The EU-15 plus Norway and Iceland

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.

Table 2-4 Export and FDI of Services by Sector of Activity

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%

Utilities, HORECA, real estate, leasing and waste management have higher shares for foreign affiliates than direct exports. These are services for which close proximity with clients is important. Generally, services which have a higher share of foreign subsidiaries than exporters also have higher share 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. We have many small direct exporters and a few major multinationals.

2.5 **Empirical model**

2.5.1 Who sells services abroad ?

Firms may choose to internationalise either by exporting from their home countries or by establishing subsidiaries in other countries or both. The decision whether to choose either foreign direct investment or exporting is dependent on the firm's decision to sell abroad, i.e. internationalise its sales. In order to uncover which firms engage in such internationalisation, we specify a selection model which distinguishes internationalised firms from firms that are only producing domestically.

To this end we specify a binomial logit model which links the probability of a firm being internationalised either by exporting or through sales from a foreign subsidiary (alternative 1) versus remaining with exclusively domestic sales (alternative 2) to a set of explanatory variables outlined below[5]. The dependent variable takes the value of one if the firm in the year considered has either exported services or has a foreign subsidiary in one of the services covered by the export data and zero otherwise:

$$\log\left(\frac{Prob\ INT}{1-Prob\ INT}\right) = \alpha + \beta_1\ \text{Firm Characteristics} + \beta_2 \text{Industry} + \beta_3 \text{Year}$$

[5] The choice between internationalising or not can be considered as related to the external margin of trade (the number of participants).

Firm characteristics include the log of turnover to measure size, the log of the number of years that the firm has been in existence (age), a dummy variable that takes the value of one if the firm is located immediately adjacent to an internal EU border and zero otherwise[6], and three dummy variables that take the value of one if the firm respectively also imports services, also exports services or is the subsidiary of a foreign firm. A further three firm specific variables apply only to those firms with employees, respectively the log of labour productivity, the log of labour cost and labour cost relative to the industry average. Industry represents the vector of dummy variables relating to the principal activity of the firm as defined by the NACE codes. Year fixed effects are included to account for differences in the business cycle. As there is considerable persistence in the decision of a firm to internationalise from one year to another, standard errors are clustered at the level of the firm.

The first regression takes standard firm characteristics and controls for industry with year fixed effects. It is the only regression to cover all firms in Belgium, including those with only the self-employed. The second regression repeats the specification of the first regression but limits the coverage to those firms with employees. This is for purposes of comparison between the base specification and those variables that are restricted to firms with employees. The third regression adds the log of the firm's labour productivity measured as value added per employee. This is replaced in the fourth regression by the log of labour cost per employee as a measure of human capital. Since both value added per employee and labour cost per employee are related, multicolinearity occurs when combined in a single regression. Instead in the fifth regression the log of labour productivity is combined with labour cost relative to the industry average.

Coefficients on the first regression covering all firms are signed as expected (table 2-5). Firms that trade, whether it be by exporting or through sales of foreign subsidiaries, are larger and older than those that do neither. They are more likely to be situated directly adjacent to an internal border with another EU member, to export goods as well as exporting services. Being the subsidiary of a foreign company

[6] 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.

however depresses the probability of outward trade, which hints at the focus on the domestic market of these firms.

Coefficients on the industry dummies (reference group is agriculture and extractive industries) are as expected from the descriptive statistics. Services with highly significant positive coefficients are transport, information & communications, professional services, administrative services and audio-visual services.

Table 2-5 Logit regressions : probability of a firm being internationalised

	(1)	(2)	(3)	(4)	(5)
	Logit_1	Logit_2	Logit_3	Logit_4	Logit_5
Internationalisation					
log turnover	0.6418***	0.6193***	0.6064***	0.5196***	0.5810***
	(0.0071)	(0.0091)	(0.0092)	(0.0094)	(0.0092)
log age	0.0309**	0.0178	0.0252	0.0278*	0.0293*
	(0.011)	(0.0133)	(0.0134)	(0.0131)	(0.0133)
border	0.0962***	0.1255***	0.1208***	0.1621***	0.1494***
	(0.0194)	(0.0225)	(0.0225)	(0.0224)	(0.0225)
service imports	0.0865**	-0.0309	-0.0392	-0.1854***	-0.0990**
	(0.0315)	(0.0325)	(0.0325)	(0.0318)	(0.0323)
goods exports	0.9670***	1.0295***	1.0250***	1.0223***	1.0401***
	(0.0459)	(0.0467)	(0.0466)	(0.046)	(0.0466)
Inward FDI	-0.8218***	-0.7817***	-0.7976***	-0.8552***	-0.8204***
	(0.1404)	(0.147)	(0.1486)	(0.1478)	(0.1484)
log productivity			0.1230***		0.0445**
			(0.0131)		(0.0139)
log labour cost				1.0176***	
				(0.0282)	
relative labour cost					0.0398***
					(0.0027)
manufacturing	-1.0607***	-1.0825***	-1.0293***	-0.9113***	-0.9684***
	(0.0684)	(0.0782)	(0.078)	(0.0771)	(0.0776)
utilities	-3.1713***	-3.5950***	-3.6719***	-3.6887***	-3.3460***
	(0.4457)	(0.3799)	(0.357)	(0.3565)	(0.3627)
construction	0.1242*	0.1039	0.1689*	0.2272***	0.1413*
	(0.056)	(0.067)	(0.067)	(0.0666)	(0.0666)
distribution	-1.2998***	-1.3660***	-1.3384***	-1.2671***	-1.3274***
	(0.0598)	(0.0718)	(0.0719)	(0.0716)	(0.0716)
HORECA	-1.7505***	-1.8533***	-1.7763***	-1.5700***	-1.8617***

	(1)	(2)	(3)	(4)	(5)
	(0.1202)	(0.136)	(0.1361)	(0.1373)	(0.1405)
transport	1.8825***	1.8679***	1.9088***	1.9249***	1.9508***
	(0.0557)	(0.067)	(0.0667)	(0.0662)	(0.0665)
communications	1.5911***	1.6631***	1.6908***	1.4574***	1.7092***
	(0.0624)	(0.0771)	(0.0769)	(0.0771)	(0.0769)
real estate	-0.113	0.0564	0.0015	-0.0081	0.0031
	(0.0713)	(0.0934)	(0.0943)	(0.0932)	(0.0939)
leasing	0.7970***	0.8073***	0.7537***	0.8829***	0.8045***
	(0.0906)	(0.1071)	(0.1107)	(0.1094)	(0.11)
professional services	1.4957***	1.4848***	1.4881***	1.2948***	1.4656***
	(0.0546)	(0.0673)	(0.0672)	(0.0675)	(0.0672)
administrative services	1.1241***	1.0567***	1.1075***	1.1245***	1.1538***
	(0.066)	(0.0803)	(0.08)	(0.0797)	(0.0803)
waste management	-0.013	-0.0576	-0.0601	-0.0166	0.0399
	(0.1963)	(0.2093)	(0.2096)	(0.1912)	(0.2011)
audio-visual services	1.3235***	1.2774***	1.2860***	1.3949***	1.2849***
	(0.0702)	(0.088)	(0.0878)	(0.0872)	(0.0875)
Year Fixed Effects	YES	YES	YES	YES	YES
constant	-12.6645***	-12.1659***	-13.3800***	-21.4242***	-12.1748***
	(0.1055)	(0.1375)	(0.193)	(0.3024)	(0.1964)
N	2015156	1078711	1078711	1078711	1078711
pseudo R^2	0.3224	0.3156	0.3163	0.3292	0.3194
AIC	430000	319000	319000	313000	318000
BIC	430000	320000	319000	313000	318000
* p<0.05	** p<0.01	*** p<0.001			
standard errors in brackets					

Restricting the data to those firms with employees leads to a drop of nearly half in the number of observations, but does not really affect the quality of fit. For the non-zero employee firms we can add the log of labour productivity as an additional explanatory variable to the baseline specification. This improves the model fit somewhat compared to the baseline model for employees only with a positive and significant coefficient as expected. Replacing the log of productivity with the log of labour costs further improves the model fit with a higher R^2 and lower AIC value. The result suggests the important role played by human capital in the development of competitive advantage in services. Interestingly, when we include both variables in the model but replace labour cost by its normalised score within the industry to reduce the collinearity between the two

variables both remain very significant. We observe therefore a combined role of productivity and human capital in explaining the firm's decision to internationalise sales.

Coefficients for logit regressions can be difficult to interpret. Those for variables in logs can be read as an elasticity but for other continuous variables as well as dummy variables the size of coefficients have little meaning. Instead a table of odds ratios is included in annexe (Table A 2-1). Coefficients for the odds ratios can be interpreted as a semi-elasticity. Unlike elasticities, semi-elasticities are not scale free and should be interpreted as the multiplicative effect of a unit change in regressor X_i on the odds ratio. It is therefore necessary to take into account the units in which X_i are measured.

Being the affiliate of a foreign multinational reduces the odds ratio of internationalisation compared to purely domestic sales by around 55%. Unlike manufacturing, for which Belgium acts as a basis for supplying export markets, foreign multinationals in services are serving more the domestic market, either because of the need for proximity to clients or to overcome behind the border barriers to trade including but not limited to regulation. Leasing firms double the odds ratio of internationalisation, administrative and audio-visual services firms triple the odds ratio of internationalisation while information and communication and professional services quadruple and transport and research and development sextuple the odds ratios. These are very high values and demonstrate the importance of industry effects along with firm specific ones as determinants of the decision to internationalise.

2.5.2 The share of sales of foreign affiliates in total foreign sales

After examining the characteristics of firms that sell abroad compared to those that do not and highlighting the importance of human capital, the question remains how these firms serve foreign markets. The choice between exporting and foreign direct investment can be modelled in different ways. For the purpose of our analysis, we are most interested in the share of sales of foreign affiliates in total foreign sales, which equals export sales plus sales of foreign subsidiaries[7]. 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 is then aggregated

[7] Based on the values of sales, this indicator can be considered as more related to the intensive margin of trade.

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 share calculation. 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.

Service characteristics are the most commonly advanced reason why firms would choose foreign direct investment over direct exports. The data from the National Bank of Belgium provides information on firm characteristics and industry from the balance sheet data, but nothing about the characteristics of the services traded by the firm . However in order to test empirically the link between service characteristics and the decision to internationalise via direct exports or sales of foreign subsidiaries, it is necessary to be able to measure these characteristics in an objective manner. A large literature in the field of consumer behaviour looks at how the nature of goods and services affects such decisions. Some studies concentrate on the intangibility aspects, others on the search-experience-credence framework and others combine the two. The results are summarised in table 2-6.

Table 2-6 Previous studies on characteristics of goods and services

Author	Sample	Coverage	Questions	Results
Iacobucci, 1992	98 MBA students	48 Goods and Services	Could be evaluated prior to purchase; could be evaluated only after purchase; would be difficult to evaluate even after purchase	Services are more credence and experience intensive than goods, slightly more complex, more heterogeneous and only relatively more intangible
Thakor & Kumar, 2000	300 Undergraduates	42 Services	Can be evaluated before purchase; can only be evaluated after using/experiencing for some time; is difficult to evaluate even after use/experience	Services with higher experience/credence attributes are more complex

Author	Sample	Coverage	Questions	Results
Krishnan & Hartline, 2001	65 Undergraduates	25 Services	Judge performance of services before purchasing on 9 point scale	Brand equity is more important for tangible goods than for services. No brand equity differences exist between search-dominant and experience or credence-dominant services.
Laroche, Bergeron & Goutaland, 2001	472 Graduate and Undergraduates	3 Goods and 3 Services	4 questions on physical intangibility, 3 questions on generality, 5 questions on mental intangibility, all measured on 9 point scale	Some services are rated as significantly more tangible than some goods
Girard, Silverblatt & Korgaonkar, 2002	30 graduate students	290 different products self selected: 64 search, 70 experience-1, 87 experience-2, 69 credence	Information could be easily obtained prior to purchase; attribute information could not be known prior to purchase; more difficult/costly to get relevant attribute information prior to purchase; relevant attribute information not available after purchase	Typical products: Search Books and Personal Computers Experience-1 Clothing and Perfume Experience-2 Cell phone and Television Credence Vitamins and Water Purifier
Laroche, Yang, Bergeron & McDougall, 2005	472 students	3 Goods and 3 Services	3 questions on physical intangibility, 2 questions on generality, 3 questions on mental intangibility, 4 questions on evaluation difficulty, 4 questions on perceived risk of purchase	Generality and mental intangibility are positively related to evaluation difficulty and perceived risk. Physical intangibility was not associated with increased evaluation difficulty or perceived risk.

Author	Sample	Coverage	Questions	Results
Huang, Lurie & Mitra, 2009	90 Undergraduate business students	3 pre selected search goods and 3 experience goods	Ability before purchase to access product quality for each of six products rated on a seven-point scale	Differences in the ability to assess product quality before purchase between search and experience goods less for online shopping than for bricks-and-mortar
Verhagen, Boter & Adelaar, 2010	156 graduate students pilot, 256 pre-test, 122 graduate students	2 goods (greeting card & calculator) and 2 services (music streaming & ADSL)	Intangibility 3*3 questions Search-Experience 4 questions 7 point scale	Goods are more tangible than services
Nakayama, Sutcliffe & Wan, 2010	48 undergraduate and gradutate pre-test, 557 from online survey	5 goods 1 service	Could be evaluated prior to purchase, could be evaluated only after some trial, would be difficult to evaluate even after trial using 7 point scale	Did not find conclusive evidence that the internet is transforming experience goods into search goods

The empirical studies provide a rich basis for comparison of characteristics across goods and services on a number of dimensions. Best practice treats the different characteristics as constructs that should be measured with the help of several different related questions that are expected to address that construct using at least a seven point scale. It is then necessary to verify that the relevant questions 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.

International trade statistics are quite detailed, at least for goods, but the goods and services reported in those statistics do not necessarily correspond with those reported in the different empirical studies. In order to be able to apply the characteristics of services that have been identified by the literature as important to data on international trade, it has been necessary to apply best practice methodology to a wider set of goods and services. 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 results from earlier studies and verified by independent research on the basis of the questions in table 2-7 using a seven point scale by three different coders in order to triangulate results.

Table 2-7 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		

Source: Verhagen *et al.*

Because the constructs to be measured as well as the variables to measure these constructs have been developed in the previously mentioned studies, confirmatory factor analysis was employed to ensure that the constructs of interest were being satisfactorily described by the variables as coded. 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. 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.

When reducing from the ninety-six goods and forty-two services in the factor analysis to the twenty-five services for which trade in services is available from the National Bank a problem of multi-collinearity arose between the different dimensions of the search-experience-credence framework, which are highly correlated among each other for these services. For that reason experience was chosen as the variable to represent that framework since it adequately covers the key dimension and is sufficiently differentiated from the intangibility variables.

Since the need for proximity between provider and customer has been identified as an important influence on trade, it was necessary to add a variable that captures this aspect. 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 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.

Experience and the mode variable are also highly correlated. Both can be related to a common latent variable “production and consumption of the service takes place simultaneously”. The connection with the latent variable is not perfect since for example in the case of construction consumption will take place long after production has been completed. However, construction is a service that both must be experienced

to evaluate quality and requires that the supplier moves to the user to provide the service again making it difficult to distinguish the influence of each separately. Taking the value of either zero or one, the mode variable is easily interpretable and so it has been preferred to the experience variable in most of the subsequent regressions. Robustness checks also use experience instead of or with the mode variable.

The dependent variable in our model expresses sales of foreign affiliates as a proportion of total foreign sales which varies between zero and one. Many firms do not have any sales of foreign affiliates. We also need to include them in the model. The Tobit model is most appropriate for this purpose.

The model can be expressed in terms of a latent variable:

$$y_i^* = X\beta + u$$

$$y_i = 0 \; if \; y_i^* \leq 0$$

$$y_i = y_i^* \; if \; y_i^* > 0$$

The variable y_i contains either zeros for firms that only export and a positive share for those who chose to sell via foreign affiliates (whether or not they also export). The model combines aspects of the binomial probit for the distinction of y_i = 0 versus y_i > 0 and the regression model for $[y_i | y_i > 0]$.
The actual model corresponds to:

$$y^* = \alpha + \beta_1 \text{Firm Characteristics} + \beta_2 \text{Industry} + \beta_3 \text{Service Characteristics} + \beta_4 \text{Year} + u$$

To the same firm characteristics, industry and year fixed effects as in the logit regressions for the probability of trading are added a vector of service characteristics, β_3. The characteristics covered are physical tangibility, generality, mental intangibility or complexity and either mode, to signify whether either the supplier or the user must travel to the point of production, or experience to denote whether the quality of a service can only be ascertained after consumption as developed above.

The estimated coefficients in a Tobit regression are the marginal effects of a change in X_j on y^* the unobservable latent variable:

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

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 will imply 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.

It is interesting to separate the two effects (McDonald and Moffit, 1980). Following Tobit estimation, we can first generate the marginal effects of each explanatory variable on the probability that a firm will have some sales via foreign affiliates. We can then calculate the marginal effect of each explanatory variable on the expected share of sales of foreign affiliates in total sales, given that the firm has some sales via foreign affiliates.

Table 2-8 uses the base specification for all firms in columns (1)-(4) and restricts the same variables in column (4) only to those firms with employees in column (5) in order to provide a reference point when additional variables not available for all firms are added. Column (1) uses only firm characteristics from β_1. Firms that sell a higher share of their total trade through foreign subsidiaries are larger, older, less likely to be located immediately on an internal border[8], less likely to also import services but more likely to export goods and more likely to be a subsidiary of a foreign firm.

Controls for industry of the trader from β_2 are added in column (2) to firm characteristics of β_1. Services which are more likely to be traded are also more likely to be traded through exporting than through sales of foreign subsidiaries (the coefficient on share of foreign affiliates is negative). Adding industry of origin improves the fit of the regressions. Akaike's information criterion (AIC) is lower indicating a better fit.

[8] Most multinational firms in Belgium are headquartered in Brussels

Service characteristics from β_3 are added to firm characteristics of β_1 in column (3). Services that are more physically tangible and easier to envisage (generality) are more likely to be exported while those that require either the supplier or user to physically move are more likely to be traded through FDI. Mentally intangible or complex services which might be considered to be more likely to be sold through a local presence are less likely to be supplied via sales of foreign subsidiaries, although the coefficient is not significant. Belgium is a major exporter of complex services such as information and communication and professional services and providers of these services have been able to overcome the uncertainty which surrounds such purchases through high reputation and other means. Compared to the firm characteristics only regressions, the fit improves indicating that adding service characteristics provides additional information.

Table 2-8 Tobit regressions of share of sales of foreign affiliates in total trade[1]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
share affiliates sales	Tobit_1	Tobit_2	Tobit_3	Tobit_4	Tobit_5	Tobit_6	Tobit_7	Tobit_8
log turnover	0.2154**	0.3760***	0.2490***	0.3419***	0.5742***	0.5006***	0.4612***	0.4745***
	(0.0795)	(0.0827)	(0.0756)	(0.079)	(0.0805)	(0.0815)	(0.0818)	(0.0816)
log age	1.2937***	1.2381***	1.4436***	1.2614***	1.0357***	1.0925***	1.0468***	1.0941***
	(0.1901)	(0.1858)	(0.1976)	(0.1826)	(0.1741)	(0.1739)	(0.1699)	(0.1729)
border	-1.1673***	-0.479	-0.3755	-0.2618	-0.0526	-0.0711	0.0742	-0.001
	(0.3043)	(0.2965)	(0.3003)	(0.2956)	(0.2817)	(0.2844)	(0.2867)	(0.2854)
service imports	-1.5825***	-1.3962***	-1.3656***	-1.2505***	-1.3683***	-1.3650***	-1.4861***	-1.4205***
	(0.3307)	(0.3153)	(0.319)	(0.3051)	(0.2995)	(0.2994)	(0.3044)	(0.3024)
goods exports	0.2101	0.5649*	0.03	0.6373*	0.5101*	0.5383*	0.5519*	0.5497*
	(0.2812)	(0.285)	(0.2797)	(0.2823)	(0.255)	(0.2517)	(0.2524)	(0.2512)
Inward FDI	7.9711***	7.0838***	7.2619***	6.6875***	5.5725***	5.5554***	5.5187***	5.5503***
	(0.8618)	(0.8331)	(0.8122)	(0.7894)	(0.7164)	(0.7156)	(0.6997)	(0.7081)
log productivity						0.7295***		0.5905***
						(0.1512)		(0.1588)
log labour cost							1.8133***	
							(0.3248)	
relative labour cost								0.0499***
								(0.0149)
manufacturing		-4.9577***		-4.5418***	-4.7080***	-4.3028***	-4.2021***	-4.3322***
		(0.7692)		(0.7549)	(0.7188)	(0.7184)	(0.7014)	(0.7113)
utilities		0.8561		1.5715	0.6574	0.4796	0.606	0.765

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		(1.4242)		(1.71)	(1.8239)	(1.6612)	(1.7876)	(1.6929)
construction		-3.9182***		-2.9346***	-3.0368***	-2.5858***	-2.3279**	-2.6862***
		(0.7697)		(0.7966)	(0.7519)	(0.7441)	(0.7119)	(0.7428)
distribution		-5.5477***		-5.1310***	-5.1019***	-4.9087***	-4.9112***	-4.9549***
		(0.8072)		(0.7922)	(0.776)	(0.7712)	(0.7604)	(0.7696)
HORECA		-1.8142		-2.3683	-2.9441	-2.2699	-1.7831	-2.2458
		(1.7889)		(1.8116)	(1.9008)	(1.8839)	(1.8815)	(1.8767)
transport		-5.1589***		-2.8908***	-2.6703***	-2.3500***	-2.1724***	-2.4321***
		(0.7222)		(0.722)	(0.657)	(0.6644)	(0.6352)	(0.659)
communications		-2.7328***		-2.3599**	-2.1992**	-1.8109**	-2.1083**	-1.8409**
		(0.7465)		(0.7364)	(0.671)	(0.6664)	(0.6523)	(0.6589)
real estate		1.6479*		0.6326	0.6539	0.3199	0.8886	0.318
		(0.7712)		(0.7376)	(0.778)	(0.7795)	(0.7658)	(0.7725)
leasing		-2.6854*		-1.8645	-2.6278*	-3.2027**	-2.2849*	-3.1045**
		(1.1526)		(1.1132)	(1.0221)	(1.1015)	(1.0118)	(1.0877)
professional services		-3.2017***		-3.4793***	-3.5513***	-3.3548***	-3.5240***	-3.4022***
		(0.6287)		(0.6432)	(0.6296)	(0.6251)	(0.6153)	(0.6211)
administrative services		-4.1153***		-4.9175***	-4.2931***	-3.8063***	-3.6321***	-3.6678***
		(0.9978)		(1.0228)	(0.9691)	(0.9475)	(0.9247)	(0.9334)
waste management		1.0845		2.8372*	2.1937	2.2529	2.0882	2.0404
		(1.4965)		(1.379)	(1.3242)	(1.3312)	(1.1126)	(1.1948)
audio-visual services		-5.9040***		-6.2996***	-5.5638***	-5.3785***	-4.8718***	-5.4068***
		(1.0806)		(1.0784)	(1.0059)	(1.0091)	(0.9752)	(1.006)
Tangibility			-0.7412***	-0.7551***	-0.6557***	-0.6085***	-0.6275***	-0.6163***
			(0.1582)	(0.1828)	(0.178)	(0.1757)	(0.1758)	(0.175)
Generality			-0.6820***	-0.8349***	-0.7037***	-0.6853***	-0.6319***	-0.6867***
			(0.1917)	(0.1954)	(0.1845)	(0.1835)	(0.182)	(0.1835)
Complexity			-0.016	-0.2101	-0.1841	-0.1721	-0.1554	-0.1862
			(0.1636)	(0.1675)	(0.1628)	(0.1618)	(0.16)	(0.1613)
Mode			1.0123**	1.2506**	1.5064***	1.5214***	1.6012***	1.5397***
			(0.326)	(0.4194)	(0.3825)	(0.3854)	(0.3858)	(0.3848)
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
constant	-18.999***	-17.343***	-15.692***	-11.821***	-14.622***	-22.355***	-33.176***	-20.443***
	(1.5461)	(1.5393)	(1.7925)	(1.8868)	(1.9313)	(2.5066)	(3.9107)	(2.5498)
sigma constant	6.3090***	6.0140***	6.0492***	5.8147***	5.0649***	5.0350***	5.0209***	5.0235***
	(0.4638)	(0.4387)	(0.4321)	(0.4153)	(0.3717)	(0.3699)	(0.368)	(0.3688)
N	75320	75320	75320	75320	61640	61640	61640	61640
AIC	21100	20100	20300	19600	15900	15800	15800	15800
BIC	21200	20400	20500	19900	16200	16100	16100	16100

* p<0.05 ** p<0.01 ***p<0.001

standard errors in brackets

[1] For R & D and Household Services data constraints prevented estimation of the sector effects

Columns (4) and (5) combine firm, industry and service characteristics in a single regression. As expected a further improvement in fit results. Overall, firm, industry and service characteristics all contribute to an understanding of why some services are more likely to be internationalised through sales of foreign subsidiaries than exported. Coefficients and significance of explanatory variables in column (5) are quite similar to those in column (4) so the rest of the analysis of shares of sales of foreign affiliates will concentrate on the employee only set since more variables are available for those firms.

Both labour productivity (value added per employee) and labour cost were found to be important for decision to sell via foreign affiliates. The coefficient on labour productivity in column (6) 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 but contradicts some of the literature on FDI in services. Labour cost per employee as a proxy for human capital in column (7) is also signed positively and significant at the 0.001 level. This is in line with the importance of firm specific intangible investments as a determinant of FDI. When labour cost relative to industry average is combined with labour productivity in column (8) both are positive and significant.

Table A 2-2 in annexe presents the marginal effects at the mean of each explanatory variable on the probability that a firm will have some sales via foreign affiliates. Table A 2-3 in annexe presents the marginal effect at the mean of each explanatory variable on the expected share of sales of foreign affiliates in total sales, given that the firm has some sales via foreign affiliates.

For the probability marginal effects, for continuous variables expressed in logs such as turnover and age, a one percent increase in the variable increases the probability of having some sales by a foreign affiliate by the coefficient in Table A 2-2. For dummy variables, the marginal effect is simply the effect on the probability of an event when indicator variable X changes from zero to one. The coefficients on the marginal effects of the probability that a firm will have some sales via foreign affiliates are very small. Only being the affiliate of a foreign firm, which raises the probability of having such sales by between 4% and 7% has substantial marginal effects. This implies that firms that supply the Belgian market through inward FDI do not use Belgium as a production

basis for exporting but instead use outward FDI as the basis of their strategy also for serving other markets. The other important firm level determinants on the probability of having sales by a foreign affiliate are the age of firm, human capital measured by labour cost and labour productivity. Service characteristics in terms of tangibility and generality decrease the probability that a firm will have sales of foreign affiliates (a one unit change on the seven point scale for tangibility and generality reduces the probability of sales by a foreign affiliate by 0.5%). The requirement for proximity between supplier and client raises the probability by around 1%.

The marginal effect on the share of sales of foreign affiliates providing sales are positive measures the change in the share of sales of foreign affiliates for a unit change in X. For dummy variables such as whether a firm is itself the affiliate of a foreign firm, a change from zero to one indicates the percentage change in the share that a firm will sell through foreign affiliates. The marginal effects of firms with positive sales via foreign affiliates are larger than those for the probability of having sales through foreign affiliates. Being the affiliate of a foreign firm now raises the share of sales by their affiliates by between 58% and 92% emphasising ownership as an influence on the choice between exports and FDI. Age of firm rather than turnover and both labour productivity and labour cost are other firm level variables with sizable marginal effects. In terms of service characteristics, it is the requirement for proximity between supplier and client that is the most important impact on the share of sales of foreign affiliates.

Finally as a robustness check we look at different combinations of service characteristics and in particular the choice between experience and mode. Table A 2-4 in annexe replaces the mode variable with that of experience in column (2) and compares the result of that of the specification with mode in column (1) while column (3) combines both in a single regression in spite of the risk of multi-collinearity. Columns (4)-(6) do the same for firms with employees.

Replacing mode with experience does not improve the fit. When both mode and experience are combined in the same regression both are signed positively but only experience remains significant and the overall fit does not change. On this basis, it would appear that both the difficulty of evaluating quality prior to purchase and the need for either the supplier or the user to physically move to the point of production

lead to a higher share of sales of foreign affiliates over direct exports as expected without being able to well distinguish the separate effect of each.

2.6 **Conclusions**

This chapter provides a comprehensive model of the choice between exports and FDI based on the heterogeneity of firms. It first examines what makes a firm international. Next it looks at the choice of entry mode using the share of exports in total trade as the variable to be explained. At the product level we expect also the firm level to be important consistent with the literature on what determines FDI among heterogeneous firms. This section innovates by looking at the service characteristics in addition to those of the firm and the industry in which trade takes place.

At the level of the firm, the characteristics of those that trade services are found to be similar to those that trade goods although service firms that trade tend to be smaller than those that trade goods. Service firms that trade are larger, older, more productive and have higher levels of human capital than those that do not engage in trade. The Melitz model is therefore considered a good basis also for trade in services.

Concerning the choice of exporting over local presence, firms that export more are found to be smaller, younger, less productive and less human capital intensive than those sell more through foreign affiliates. The model of Helpman et al. 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 literature on the choice of entry method in services compared to goods.

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 for market entry, 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 the choice between different forms of market entry. 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 physical intangibility play a role but one that is secondary to proximity. 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 chapter 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.

It would 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. 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?”.

Annexes

Table A 2-1 Odds Ratio of Logit regressions on the probability of internationalisation

Odds Ratio	(1)	(2)	(3)	(4)	(5)
	Logit_1a	Logit_2a	Logit_3a	Logit_4a	Logit_5a
Internationalisation					
log turnover	1.8998475***	1.8577065***	1.8338495***	1.6813464***	1.7878281***
log age	1.0313686**	1.0179946	1.0255521	1.0281593*	1.0297037*
border	1.1009802***	1.1337608***	1.1283668***	1.1759632***	1.1611694***
service imports	1.0903416**	0.96954167	0.96157274	.83076049***	.90571499**
goods exports	2.6301121***	2.7996194***	2.7870826***	2.7794593***	2.8295417***
Inward FDI	.43963942***	.4576427***	.45042032***	.42520798***	.44026917***
log productivity			1.1309282***		1.0454572**
log labour cost				2.7666066***	
relative labour cost					1.0405671***
manufacturing	.34619659***	.33874311***	.35725429***	.40201812***	.37970277***
utilities	.04194783***	.02746157***	.0254276***	.02500405***	.03522556***
construction	1.132266*	1.1094436	1.184055*	1.2551341***	1.151719*
distribution	.27258852***	.25512333***	.26226719***	.28164361***	.26515978***
HORECA	.1736852***	.15671886***	.16926333***	.20804292***	.15540642***
transport	6.570052***	6.4744202***	6.7446754***	6.854236***	7.0344467***
communications	4.908939***	5.275854***	5.424032***	4.2947839***	5.5245169***
real estate	0.89315189	1.0580416	1.0015427	0.99196097	1.0030601
leasing	2.2188951***	2.2418877***	2.1248887***	2.4179034***	2.2356063***
research & development	6.2873245***	5.4529225***	5.5238481***	3.9730812***	5.9250555***
professional services	4.462268***	4.4139571***	4.4286058***	3.6503633***	4.3301177***
administrative services	3.0775945***	2.8768761***	3.0268948***	3.0787772***	3.1701171***
waste management	0.98709395	0.94402321	0.94170365	0.98355176	1.0406839
audio-visual services	3.75637***	3.5871634***	3.6184165***	4.0346275***	3.6143313***
household services	.37628153***	.33404725***	.3574331***	.46705315***	.32376656***
Year Fixed Effects	YES	YES	YES	YES	YES
constant	0.000003161***	0.000005205***	0.000001546***	0.0000000004961***	0.000005159***
* p<0.05	** p<0.01	*** p<0.001			

Table A 2-2 Marginal effects of Tobit regressions on the probability that a firm will have some sales by foreign affiliates[1]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
share affiliates sales	Tobit_1 dy/dx	Tobit_2 dy/dx	Tobit_3 dy/dx	Tobit_4 dy/dx	Tobit_5 dy/dx	Tobit_6 dy/dx	Tobit_7 dy/dx	Tobit_8 dy/dx
log turnover	0.0019**	0.0029***	0.0020**	0.0024***	0.0043***	0.0037***	0.0033***	0.0035***
log age	0.0113***	0.0096***	0.0114***	0.0090***	0.0077***	0.0080***	0.0076***	0.0080***
border	-0.0102***	-0.0037	-0.003	-0.0019	-0.0004	-0.0005	0.0005	0.00
service imports	-0.0138***	-0.0109***	-0.0107***	-0.0089***	-0.0102***	-0.0100***	-0.0107***	-0.0103***
goods exports	0.001829	0.0043976	0.0002363	0.0045*	0.0038*	0.0039*	0.0040*	0.0040*
Inward FDI	0.0694***	0.0551***	0.0571***	0.0477***	0.0416***	0.0408***	0.0400***	0.0404***
log productivity						0.0054***		0.0043***
log labour cost							0.0131***	
relative labour cost								0.0004**
manufacturing		-0.0386***		-0.0324***	-0.0351***	-0.0316***	-0.0304***	-0.0315***
utilities		0.0067		0.0112	0.0049	0.0035	0.0044	0.0056
construction		-0.0305***		-0.0209***	-0.0227***	-0.0190***	-0.0168**	-0.0196***
distribution		-0.0432***		-0.0366***	-0.0381***	-0.0360***	-0.0355***	-0.0361***
HORECA		-0.0141		-0.0169	-0.022	-0.0167	-0.0129	-0.0164
transport		-0.0402***		-0.0206***	-0.0199***	-0.017***	-0.0157**	-0.0177***
communications		-0.0213***		-0.0168**	-0.0164**	-0.0133**	-0.0152**	-0.0134**
real estate		0.0128*		0.0045	0.0049	0.0023	0.0064	0.0023
leasing		-0.0209*		-0.013289	-0.0196**	-0.0235**	-0.0165*	-0.0226**
professional services		-0.0249***		-0.0248***	-0.0265***	-0.0246***	-0.0255***	-0.0248***
administrative services		-0.0320***		-0.0350***	-0.0320***	-0.0279***	-0.0262***	-0.0267***
waste management		0.0084		0.0202*	0.0164	0.0165	0.0151	0.0149
audio-visual services		-0.0460***		-0.0449***	-0.0415***	-0.0395***	-0.0352***	-0.0394***
Tangibility			-0.0058***	-0.0054***	-0.0049***	-0.0045***	-0.0045***	-0.0045***
Generality			-0.0054***	-0.0060***	-0.0053***	-0.0050***	-0.0046***	-0.0050***
Complexity			-0.0001	-0.0015	-0.0014	-0.0013	-0.0011	-0.0014
Mode			0.0080**	0.0089**	0.0112***	0.0112***	0.0116***	0.0112***
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
* p<0.05	** p<0.01	***p<0.001						

[1] For R & D and Household Services data constraints prevented estimation of the sector effects

Table A 2-3 Marginal effects of Tobit regressions on the share of sales of foreign affiliates providing sales are positive[1]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
share affiliates sales	Tobit_1 dy/dx	Tobit_2 dy/dx	Tobit_3 dy/dx	Tobit_4 dy/dx	Tobit_5 dy/dx	Tobit_6 dy/dx	Tobit_7 dy/dx	Tobit_8 dy/dx
log turnover	0.0247**	0.0414***	0.0276**	0.0366***	0.0601***	0.0521***	0.0478***	0.0493***
log age	0.1485***	0.1365***	0.1597***	0.1350***	0.1084***	0.1138***	0.1085***	0.1137***
border	-0.1340***	-0.0528	-0.0415	-0.0280	-0.0055	-0.0074	0.0077	-0.0001
service imports	-0.1817	-0.1539***	-0.1511***	-0.1338***	-0.1433***	-0.1421***	-0.1541***	-0.1476***
goods exports	0.0241	0.0625*	0.0033	0.0682*	0.0534*	0.0560*	0.0572*	0.0571*
Inward FDI	0.9150***	0.7807***	0.8036***	0.7155***	0.5834***	0.5784***	0.5722***	0.5766***
log productivity						0.0760***		0.0613***
log labour cost							0.1880***	
relative labour cost								0.0052**
manufacturing		-0.5464***		-0.4859***	-0.4929***	-0.4480***	-0.4357***	-0.4501***
utilities		0.0943		0.1681	0.0688	0.0499	0.0628	0.0795
construction		-0.4318***		-0.3140***	-0.3179***	-0.2692**	-0.2414**	-0.2791***
distribution		-0.6114***		-0.5490***	-0.5341***	-0.5111***	-0.5093***	-0.5148***
HORECA		-0.1999		-0.2534	-0.3082	-0.2363	-0.1849	-0.2333
transport		-0.5686***		-0.3093***	-0.2800***	-0.2447***	-0.2253**	-0.2527***
communic-ations		-0.3012***		-0.2525**	-0.2302**	-0.1886**	-0.2186**	-0.1913**
real estate		0.1816*		0.0677	0.0685*	0.0333	0.0921	0.0330
leasing		-0.2960*		-0.1995	-0.2751**	-0.3335**	-0.2369*	-0.3225**
professional services		-0.3529***		-0.3722***	-0.3718***	-0.3493***	-0.3654***	-0.3535***
administrative services		-0.4536***		-0.5261***	-0.4494***	-0.3963***	-0.3766***	-0.3815***
waste management		0.1195		0.3035*	0.2297	0.2346	0.2165	0.2120
audio-visual services		-0.6507***		-0.6740***	-0.5825***	-0.5600***	-0.5052***	-0.5617***
Tangibility			-0.0820***	-0.0808***	-0.0686***	-0.0634**	-0.0651***	-0.0640
Generality			-0.0755***	-0.0893***	-0.0737***	-0.0714***	-0.0655***	-0.0714***
Complexity			-0.0018	-0.0225	-0.0193	-0.0179	-0.0161	-0.0193
Mode			0.1120**	0.1338**	0.1577***	0.1584***	0.1660***	0.1600***
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
* p<0.05	** p<0.01	***p<0.001						

[1] For R & D and Household Services data constraints prevented estimation of the sector effects

Table A 2-4 Tobit regressions with different service characteristics[1]

	(1)	(2)	(3)	(4)	(5)	(6)
share affiliates sales	Tobit_1	Tobit_2	Tobit_3	Tobit_4	Tobit_5	Tobit_6
log turnover	0.3419***	0.3428***	0.3441***	0.5742***	0.5803***	0.5807***
	(0.079)	(0.079)	(0.0791)	(0.0805)	(0.0808)	(0.0805)
log age	1.2614***	1.2607***	1.2595***	1.0357***	1.0379***	1.0348***
	(0.1826)	(0.1826)	(0.1825)	(0.1741)	(0.1743)	(0.174)
border	-0.2618	-0.2538	-0.2362	-0.0526	-0.0557	-0.0262
	(0.2956)	(0.2946)	(0.2948)	(0.2817)	(0.2812)	(0.2807)
service imports	-1.2505***	-1.2404***	-1.2387***	-1.3683***	-1.3662***	-1.3625***
	(0.3051)	(0.3046)	(0.3043)	(0.2995)	(0.2993)	(0.299)
goods exports	0.6373*	0.6595*	0.6569*	0.5101*	0.5323*	0.5310*
	(0.2823)	(0.2815)	(0.2817)	(0.255)	(0.2539)	(0.2541)
Inward FDI	6.6875***	6.7144***	6.6915***	5.5725***	5.5868***	5.5643***
	(0.7894)	(0.7842)	(0.7854)	(0.7164)	(0.7089)	(0.7103)
manufacturing	-4.5418***	-4.6797***	-4.6210***	-4.7080***	-4.9044***	-4.8117***
	(0.7549)	(0.7565)	(0.7569)	(0.7188)	(0.7238)	(0.7222)
utilities	1.5715	1.5296	1.5912	0.6574	0.5256	0.6315
	(1.71)	(1.7186)	(1.7315)	(1.8239)	(1.8479)	(1.8636)
construction	-2.9346***	-3.3953***	-3.2433***	-3.0368***	-3.5639***	-3.3671***
	(0.7966)	(0.8164)	(0.8264)	(0.7519)	(0.7763)	(0.7808)
distribution	-5.1310***	-5.2900***	-5.1963***	-5.1019***	-5.3356***	-5.2009***
	(0.7922)	(0.7933)	(0.7936)	(0.776)	(0.7793)	(0.7784)
HORECA	-2.3683	-2.4453	-2.4147	-2.9441	-3.0869	-3.0288
	(1.8116)	(1.7869)	(1.79)	(1.9008)	(1.8621)	(1.8682)
transport	-2.8908***	-3.1035***	-2.8429***	-2.6703***	-3.0085***	-2.6404***
	(0.722)	(0.6892)	(0.723)	(0.657)	(0.6373)	(0.6583)
communic-ations	-2.3599**	-2.7986***	-2.5053***	-2.1992**	-2.7644***	-2.3637***
	(0.7364)	(0.7346)	(0.7417)	(0.671)	(0.6883)	(0.6759)
real estate	0.6326	0.659	0.6377	0.6539	0.6498	0.6439
	(0.7376)	(0.7408)	(0.7383)	(0.778)	(0.7825)	(0.7797)
leasing	-1.8645	-1.5004	-1.6239	-2.6278*	-2.2022*	-2.3588*
	(1.1132)	(1.0887)	(1.1135)	(1.0221)	(1.0002)	(1.0196)
professional services	-3.4793***	-3.5398***	-3.5512***	-3.5513***	-3.6640***	-3.6588***
	(0.6432)	(0.6498)	(0.6488)	(0.6296)	(0.6401)	(0.6373)
administrative services	-4.9175***	-4.9091***	-4.9213***	-4.2931***	-4.3014***	-4.3010***
	(1.0228)	(1.0238)	(1.0226)	(0.9691)	(0.9705)	(0.9689)
waste management	2.8372*	2.7017*	2.8255*	2.1937	1.9868	2.166
	(1.379)	(1.3655)	(1.3719)	(1.3242)	(1.3116)	(1.317)

	(1)	(2)	(3)	(4)	(5)	(6)
audio-visual						
services	-6.2996***	-6.1653***	-6.2266***	-5.5638***	-5.4235***	-5.4890***
	(1.0784)	(1.0767)	(1.0764)	(1.0059)	(1.0052)	(1.0045)
Tangibility	-0.7551***	-0.5968***	-0.6610***	-0.6557***	-0.4827**	-0.5602**
	(0.1828)	(0.1667)	(0.1842)	(0.178)	(0.1623)	(0.1778)
Generality	-0.8349***	-0.6757***	-0.6769***	-0.7037***	-0.5241**	-0.5318**
	(0.1954)	(0.1809)	(0.1814)	(0.1845)	(0.1696)	(0.1703)
Complexity	-0.2101	0.0309	-0.0296	-0.1841	0.0883	0.0074
	(0.1675)	(0.1533)	(0.1578)	(0.1628)	(0.1466)	(0.1499)
Mode	1.2506**		0.6775	1.5064***		0.8812
	(0.4194)		(0.4981)	(0.3825)		(0.4675)
Experience		0.6941***	0.4908*		0.7917***	0.5331*
		(0.1908)	(0.2272)		(0.1715)	(0.2122)
Year Fixed						
Effects	YES	YES	YES	YES	YES	YES
constant	-11.8210***	-16.6180***	-15.6228***	-14.6223***	-20.0419***	-18.7621***
	(1.8868)	(2.2646)	(2.3016)	(1.9313)	(2.2206)	(2.2786)
sigma						
_cons	5.8147***	5.8106***	5.8086***	5.0649***	5.0615***	5.0571***
	(0.4153)	(0.4158)	(0.4152)	(0.3717)	(0.3729)	(0.3718)
N	75320	75320	75320	61640	61640	61640
AIC	19600	19500	19500	15900	15900	15900
BIC	19900	19900	19900	16200	16200	16200

* p<0.05 ** p<0.01 ***p<0.001

standard errors in brackets

[1] For R & D and Household Services data constraints prevented estimation of the sector effects

Chapter 3.
TRADE COSTS AND SERVICES

3.1 Introduction

This chapter investigates to what extent characteristics of services affect the direction and size of cross-border trade flows. To this end the widely used and accepted gravity model is applied to a data set of European countries. It covers seventeen different services over the period 2006 to 2012. Previous research on trade in services has mainly focused on a limited set of variables, but largely ignored the features that differentiate services from each other. The contribution of this chapter is to extend the previous work on trade to services to cover ways in which attributes of services can affect outcomes in terms of cross-border trade.

Section two provides an overview of the literature on international trade in services using the gravity model. Section three sets out the hypotheses concerning the way in which service characteristics are expected to affect trade. Section four develops the structural gravity model used in the chapter. Section five presents the data. Section 6 presents the results. Section 7 concludes.

3.2 Literature Review

Traditional gravity models for goods have attempted to explain trade patterns in terms of a limited number of commonly used variables (distance, contiguity or adjacency, common language and colonial ties). Up until now the literature on trade in services has essentially replicated that on goods, using the same type of data (imports and exports of services by value), the same type of model (gravity equations) and the same type of explanatory variables. The extent to which all the elements used for gravity models for goods apply to services is an important area for research.

Service models have been estimated with a gravity equation separately for total goods and total services and for exports and imports using OECD data but with differing specifications of the gravity equation (Kimura and Lee, 2006; Ceglowski, 2006). The results indicate that geographical distance is more important for services trade than for goods trade but that this finding is sensitive to the specification of the gravity equation. Equally, sharing a common border or a common language have positive and

significant effects for services when the gravity equation is estimated using the “naïve” or Tinbergen formulation, while these are no longer significant for services when country fixed effects are added. The results are therefore quite sensitive to specification when using identical or similar data.

Services are very heterogeneous and more recent studies have disaggregated total trade in services into different services to varying degrees (Walsh, 2008; Head, Mayer and Ries, 2009; Anderson, Borchert, Mattoo and Yotov, 2015). Results are again found to be sensitive to specification. In the case of Walsh, with pooled OLS the coefficients on standard gravity variables are all significant and signed as expected. However, with the Hausman-Taylor model distance and sharing a common border are no longer significant. For travel services and other commercial services neither distance nor sharing a common border were found to be significant leaving only the common language variable as significant. For transport services both distance and sharing a common border became significant but no longer sharing a common language.

Other Commercial Services (OCS), further subdivided into Finance, IT and Miscellaneous business services (MBS) were the subject of the study by Head *et al*., Results indicate that when using fixed effects the negative effect of distance on trade in other commercial services was higher for than that for goods in 1992 but that by 2006 it had fallen to an extent that the distance effect had become lower than that for goods. The effects of colonial relations and shared legal origin were found to be somewhat stronger for OCS than goods, but shared language entered insignificantly for OCS. Finance and IT exhibited a declining and significant effect of distance while that for MBS also declined but not significantly. Coefficients for a shared common language for the three services produced perverse negative signs whereas estimates of the effect of colonial relationships and shared legal origins were positive, significant, and generally comparable across categories.

The most disaggregated model of services has been estimated by Anderson et al. using a structural gravity model for 12 service sectors for 28 countries over the period 2000 to 2007. The results indicate important differences in estimated coefficients of standard gravity variables between goods and services and across different services. Distance effects on services trade are highly non-linear with strong negative effects for

short distances and insignificant effects for long distances for sectors such as Transportation, Travel, Communication, Construction, Merchanting and Audiovisual services. For Financial and Computer services they obtain insignificant short-distance effects but negative and significant effects over long distances. Distance effects were insignificant for Insurance services, Operational Leasing, Business services and Research and Development. Language has a positive and usually significant coefficient. Contiguity and colonial ties have more nuanced effects with contiguity depending strongly on the individual sector and colonial ties being generally insignificant.

In terms of the size of trade costs compared to domestic costs, Anderson et al find that border barriers in services trade are large, significant, and vary widely:

(i) Across countries with economic size reducing border barriers in services trade.

(ii) Across sectors, where border barriers vary in an intuitive way.

(iii) Over time, border barriers in services trade have fallen, even though the decrease varies considerably across sectors and across countries.

Two papers use Canadian data on inter-provincial trade to measure home bias in trade in services (Lejour and de Paiva Verheijden, 2007; Anderson, Milot & Yotov, 2014). The first paper compares Canadian inter-provincial trade with intra-EU trade in services to estimate the possibilities for increased trade in services within the EU. On average distance is found to be less a hindrance for services trade than for goods trade. Language and regulation differences hamper intra-EU trade significantly.

Canadian intra-provincial sales of services are compared by Anderson et al. with inter-provincial and international trade in services to generate measures of home, domestic and foreign bias in services trade. The border directly reduces average provincial trade with the United States relative to interprovincial trade to 2.4% of its borderless level. Geography reduces services trade some seven times more than goods trade overall. The bias towards sales within the home province is always high and significant across services and across provinces.

Two trends in the various papers that apply gravity equations to services can be identified. The first is a growing tendency to disaggregate total trade in services, although the number of services studied remains small. The second is growing attention to the specification of the gravity model, with fixed effects replacing earlier models.

While the previous papers generally find that the gravity model works well for services, the relevance of the commonly used proxies for trade in services needs to be examined critically. This applies in the first instance to transport costs, since services do not typically incur such costs. The role of distance, which can be directly linked to transport costs for goods, can therefore be expected to be different for services than for goods. Where distance should play a similar role for services as for goods is for those services that involve the physical transfer of something or someone to one place and another.

Services which can be delivered electronically without any interaction between supplier and client ought to be distance free since costs are not related to distance. However, gravity has been found to hold in the case of digital goods consumed over the Internet that have no trading costs, but only for taste-dependent digital products and not for products such as software (Blum and Goldfarb, 2006). This effect is attributed to cultural distance. Where interaction between supplier and client is required for the service to be provided, as is the case with many services, the distance effect could be expected to be stronger than for goods since transporting people is more expensive than transporting goods. Thus the distance effect for services should vary considerably between one service and another rather than between goods and services.

The commonly used contiguity or adjacency variable often found in gravity equations is clearly not independent of distance, since adjacent countries must be closer together than non-adjacent ones. The question then arises what in addition to distance are the costs to which contiguity refers. In the case of services and the EU contiguity may play a specific role for local cross-border markets, which cover a third of the EU population. However, to pick up such effects disaggregated trade data at a local or regional level would probably be required.

Common language is the variable most often found in gravity equations after distance and contiguity. The relationship between language and trade costs has been examined

in more detail, but only with regard to goods (Melitz, 2008; Melitiz and Toubal, 2014). For certain forms of commerce, such as e-commerce, translation may be sufficient to overcome barriers to commerce. When interaction with clients becomes important then the ability to function in a common language is also required. By using four different measures of language and a decomposition of bilateral trade between homogeneous goods, listed goods and differentiated goods, it is possible to identify separate effects of language according to the nature of the good. Differentiated goods, which most resemble services, exhibit the highest impact of common languages.

3.3 **Hypotheses**

Trading either goods or services incurs transaction costs. It is the nature and amount of these costs compared to those incurred by domestic suppliers that determines to a large degree the amount of trade. Trade costs therefore are simply the transaction costs that arise when purchasing or selling across national borders and include all costs incurred in getting a product to the final user other than the marginal cost of producing the product itself, including transportation costs, policy barriers, information costs, contract enforcement costs, costs associated with the use of different currencies, legal and regulatory costs and local distribution costs (Anderson and van Wincoop, 2004).

Trade costs are as applicable to services as they are to goods (Miroudot, Sauvage & Shepherd, 2013). The cost for services to cross borders are found to be very high compared to goods. A top down approach inferring trade costs from observed patterns of trade and production yields an estimate of magnitude but not the nature of the costs involved. However the nature and level of trade costs for services are not necessarily the same as those for goods because of different characteristics of services and because they are traded in a number of different ways to goods.

The OECD divides trade costs into three categories according to whether they occur behind the border, getting to the border or at the border. For services, most barriers occur behind the border (Moïsé & Le Bris, 2013). In order to further identify the nature of costs involved in crossing borders for services it is useful to go back to the literature on transaction costs broadly defined which cover:

- *Search and information costs* which are costs such as in determining that the required service is available on the market, what is the quality of the service on offer, which has the lowest price, etc.

- *Bargaining costs* which are the costs required to come to an acceptable agreement between supplier and user of the service and can include drawing up an appropriate contract or more informal agreements.

- *Policing and enforcement costs* which are the costs of making sure the other party sticks to the terms of the contract, and taking appropriate action (often through the legal system) if this turns out not to be the case.

Transaction cost economics examines the comparative costs of planning, adapting and monitoring task completion under alternative governance structures (Williamson, 1981). Since some transactions are simple they can more easily be governed by arms length market relations, while others are difficult and require more attention. Complex contracts are costly to write and enforce. This stems from bounded rationality where agents experience limits in formulating and solving complex problems and processing information. It then becomes impossible to deal with complexity in all contractually relevant respects and as result relational forms of contracting become more important. Combined with the possibility of opportunistic behaviour by economic agents who make false or misleading claims about their products, it makes incomplete contracting an inherently risky business.

Transaction cost analysis has been applied to services through the costs involved in the services exchange between the service organization and the customer (Bowen and Jones, 1986). Two particular sources of transaction cost for services have been identified: performance ambiguity and goal incongruence. Performance ambiguity occurs where either the provider or the customer has difficulty in evaluating the service to be exchanged. Goal incongruence occurs when the returns from competitive behaviour exceed those from cooperative behaviour. Together they characterise a service encounter as a combination of the characteristics of the service to be exchanged and the nature of the relationship that exists between supplier and customer.

Physical intangibility is the most important characteristic influencing performance ambiguity. Assessing the service becomes progressively more difficult when it can neither be touched nor possessed. Extensive customization can make it more difficult to evaluate quality since points of comparison are lacking. Simultaneity of production and consumption will mean that there is no possibility to return a service after purchase and the inability to store a service poses problems of managing capacity. Inability to evaluate a service prior to purchase leads to higher monitoring costs after purchase as well as higher risk when buying services. Asymmetric information between service provider and client leads to higher search costs as the customer may need to contact several different suppliers to assess a fair market value. Measuring value is also made more difficult in the case of complex or uncertain transactions.

Goal incongruence and the potential for opportunistic behaviour can arise in service transactions through a variety of causes. First again is unequal information between parties about the service to be exchanged. Infrequent purchases are likely to lead to opportunism and so to goal incongruence while frequent purchases provide an incentive to avoid opportunistic behaviour and the basis for the development of relational forms of exchange. Monopoly suppliers that were traditionally common in infrastructure services also provide an opportunity for the supplier to act in a way that is detrimental to the client. Goal congruence facilitates co-production of a service and the development of those relational forms required where simultaneity of production and consumption is required.

When engaging in cross-border trade, many of the transaction costs that occur domestically can be expected to be higher. They can affect the decision whether to engage in international trade or not. When the decision is taken to engage in trade, the nature of transaction costs may affect the value of trade differently from the decision whether to trade or not. For example, construction is a very tangible service that is very locally based and for which the share of output traded internationally is very low. However there is a segment of the construction sector, large public works, that is traded internationally and which is dominated by a few large multinational firms that operate world-wide. While the propensity to engage in cross-border trade for construction is very low, once that decision has been taken it can result in very large individual transactions.

The data on international trade in services that is used to estimate gravity equations looks at the value of transactions between partners during a certain period. It is therefore how transaction costs affect the amount of trade that is primarily of interest rather than how they affect the decision to trade. When and how characteristics of services enter into effect depends on the value of trade. They can be expected to affect the standard variables employed in gravity equations and in particular distance which as developed in the literature review may apply differently according to the characteristics of the service in question.

The ability to effectively compare the characteristics and prices of different services will improve transparency and lower search and information costs. Search goods are those for which it is possible to accurately predict quality before purchase while the quality of experience goods can only be determined by use and experience after purchase (Nelson, 1970). Darby and Karni (1973) further extended the taxonomy of Nelson to include credence goods that are intangible characteristics that the consumer may find impossible to evaluate, even after purchase and consumption. With credence goods, the user must base the purchase decision on trust. Since services primarily are composed of experience and credence qualities, they generally are more difficult to evaluate than goods and there typically will be more performance ambiguity surrounding the exchange of services than goods. As a result, as transaction costs increase the more difficult it becomes to monitor and evaluate the service being provided.

Hypothesis 1: Services that are higher in experience will depress trade in services

As developed in the literature on transaction costs, fundamental for consumers is how to obtain information about the service, comparing alternative providers and evaluating the service encounter (Ostrom and Iacobucci, 1995). The different characteristics of services are linked to the perceived difficulty of evaluation. They are also linked to perceived risk of purchase both directly and indirectly through the difficulty of evaluation (Laroche, Yang, McDougall & Bergeron, 2005). Using a foreign supplier of a service can be considered as increasing the riskiness of a transaction. Differing languages and cultural norms may give rise to misunderstandings about the nature of the service to be provided. The further the distance between the parties to an exchange, the more difficult monitoring becomes. Complex services will be particularly

tricky to enforce because they are both difficult to put in contractual form and to the extent that a legal contract is made it may be in practice unenforceable in a foreign jurisdiction thereby increasing goal incongruence.

Hypothesis 2: Complexity depresses trade in services

A common characteristic of services is that they are consumed at the same time as they are produced (Hill, 1977). It follows that service transactions will usually require some interaction between user and provider (Francois, 1990). The degree and forms of interaction between producer and user can be formalised as the fraction of the total costs of service to the user incurred during that interaction (Hirsch, 1989). While the need for interaction represents a defining feature of many services, it may be possible for the provider and user of a service to interact at distance. Nevertheless, it remains the case that certain services require that both the supplier and the user be present simultaneously for the service to be performed, leading in some cases even to co-production. Services that require the physical proximity of the user and the provider are known as proximity services (Sampson and Snape, 1985). In order to be traded cross border, these services require either the user or the provider to move to the location of the other party (respectively modes 2 and 4 under the GATS). To the extent that cost and time of travel depends on distance, one would expect that services requiring proximity would be most likely to be affected by distance and therefore incur increased costs for cross-border trade.

The possibility that interaction can take place at distance is greatly facilitated by information technology. Information technology services are themselves tradable across borders but their main function is to facilitate cross-border trade in other services (Nath and Liu, 2017). According to the IMF, the internet and other systems of network technologies like mobile phones, big data and artificial intelligence are providing technical changes to production techniques and business processes (Loungani, Mishra, Papageorgiou & Wang, 2017). ICT enabled services are called modern services and cover computer, information, some business and financial services. Their share in services trade has been increasing over time with world exports of computer and information services in particular expanding much more rapidly than any other service sector with average annual growth of 18% between 1995 and 2014 (Loungani *et al*, 2017).

Hypothesis 3: Services that require simultaneous physical presence of both supplier and user will depress trade in services.

The transaction cost literature makes intangibility a prime cause of higher performance ambiguity through the difficulty of evaluation and increased risk associated with the purchase. In that case, physical intangibility will act in a similar fashion to complexity to decrease the value of trade in services. Evaluation difficulty can be diminished when credible means exist to rate the quality of service provided. Systems introduced by companies such as Airbnb or Uber allow both parties to a service to evaluate the quality of the exchange thereby bringing more transparency to the service (Einav, Farronato & Levin, 2015).

According to Hill, the essential characteristics of a good are that it is an entity over which ownership rights may be established and from which its owner derives some economic benefit (Hill, 1999). It follows that a good exists independently of its owner and preserves its identity through time. Ownership rights can be transferred, which means that goods must be exchangeable or tradable. Separability of production and exchange go hand in hand with the ability to store and transport goods from one location to another. Hill describes as intangible goods certain services which have all the economic characteristics of goods. They consist of original additions to knowledge and new information that can be stored on some medium and transmitted in the same way as goods. They differ from goods because the originals must be distinguished from the physical support on which they are recorded. Those services that can be transported and stored facilitate trade cross border by permitting a physical separation between the supplier and the user. Indeed the ability to be transported cheaply and swiftly in the form of binary bits means that the cost of trading services becomes less rather than more than goods.

While difficulty of evaluation would tend to make intangible services less likely to be traded across borders, the possibility for some intangible services to be stored and transported in digital form at lower cost that transporting goods means that they could on the contrary promote trade in services. According to whether the additional cost of transportation or the difficulty of evaluation is dominant, the effect of physical tangibility on trade will be either positive or negative.

Hypothesis 4A: Physical Tangibility facilitates cross border trade in services

Hypothesis 4B: Physical Tangibility hinders cross border trade in services

3.4 **Methodology**

Gravity equations have become the workhorse of the literature on international trade, but to apply gravity equations correctly four different issues need to be addressed: the correct specification of the basic gravity equation, the problem of missing or zero values for trade flows, heteroscedasticity and aggregation bias. Aggregation bias results from estimating trade costs with aggregate data when trade costs vary at the disaggregate level, which can happen with aggregation over trading partners or aggregation over products (Anderson and van Wincoop, 2004). This is highly likely with services. Anderson and van Wincoop's recommendation is to disaggregate and this paper uses the most disaggregated data currently available. But disaggregation can never be as fine as reality, so some degree of aggregation bias is inevitable.

Gravity equations can be applied in a wide class of models provided that trade across countries can be analysed separately from production and consumption within countries (Anderson and van Wincoop, 2003; 2004). Bilateral trade depends on relative trade barriers. It follows that the gravity model can only identify relative costs. The most general formulation of the gravity equation relates trade between the origin and destination countries respectively to the output and expenditure of those countries, to the size of the trade costs incurred in trade between origin and destination countries and outward and inward multilateral resistance terms that measure the *average* barrier of the two countries to trade with all their partners (Fally, 2015).

For each exporter *i* and importer *j*, trade flows X_{ij} should satisfy:

$$X_{ij} = \frac{Y_i}{\Pi_i^{-\theta}} \cdot D_{ij}^{-\theta} \cdot \frac{E_j}{P_j^{-\theta}} \quad (1)$$

Y_i refers to total output in country *i* while E_j refers to total expenditure in country j. Trade costs from *i* to *j* are captured by D_{ij} with the parameter θ reflecting the elasticity of trade flows to trade costs. Finally, the terms $P_j^{-\theta}$ and $\Pi_i^{-\theta}$ cover Anderson and van Wincoop's "multilateral resistance" indexes by respectively "inward" and "outward" resistance indexes.

Following Fally, to estimate equation (1), there are broadly two approaches which differ in the treatment of exporter terms $\frac{Y_i}{\Pi_i^{-\theta}}$ and importer terms $\frac{E_j}{P_j^{-\theta}}$. A first approach, the reduced-form, simply introduces exporter and importer fixed effects e_i and m_j without imposing any constraints on these terms. The other more structural approach pioneered by Anderson and van Wincoop uses observed expenditure by country *j* and observed output in country *i* to estimate multilateral resistance terms (Fally, 2015).

This chapter follows the first approach, with the estimated equation for the fixed effects approach to equation (1) specified as:

$$X_{ij} = exp\left[e_i - \theta log D_{ij} + m_j\right] . \varepsilon_{ij} \quad (2)$$

where e_i and m_j represent respectively origin and destination fixed effects and ε_{ij} denotes an error term. It has been customary to model the trade cost variable, $log D_{ij}$, as a linear combination of a number of standard variables among which the log of physical distance always figures along with some combination of dummies for common language, contiguity or adjacency and former colonial links.

The use of fixed effects makes the gravity equation very easy to estimate. Various estimators have been used: ordinary least squares (in log), non-linear least-squares, Poisson-PML, Gamma-PML and negative binomial estimators have all been employed to estimate equation (2). From the earliest versions of the gravity equation it has been the custom to take logs of the trade variables thus transforming a multiplicative model into an additive one that can be estimated with OLS. However, one of the consequences of taking logs is to drop all observations with a zero or missing value. Since all data sets for international trade contain many zeros and the proportion usually rises with the degree of product disaggregation, ignoring zero and missing values can be a source of substantial selection bias. To deal with zero values it has now become standard to estimate gravity equations using Poisson pseudo-Maximum Likelihood (PPML) in the place of OLS (Santos Silva and Tenreyro, 2006). To correct for standard errors when faced with heteroscedasticity, robust methods clustered on the country pair, *ij*, should be used.

The Poisson regression model specifies the count y to have a conditional mean of the exponential form (Anderson et al., 2015):

$$E(X|Z) = \exp(Z'\beta) = \frac{Y_i E_j}{Y}\left(\frac{\tau_{ij}(\beta)}{\Pi_i \mathrm{P}_j}\right)^{1-\sigma} \quad (3)$$

Following Anderson et al. (2015) equation (3) can be estimated as :

$$X_{ij} = \chi x_i m_j \tau_{ij} + \varepsilon_{ij,} \ \forall i,j \quad (4)$$

Where χ denotes the constant, $x_i$is an exporter fixed effect for country *i*, m_j is an importer fixed effect for country *j*, and τ_{ij} is a trade cost factor representing the effect of gravity forces that reduce bilateral trade between *i* and *j*, $X_{ij.}$ When sufficient data are available to distinguish between trade within and between countries, it is possible to include and identify τ_{ii} , the intra-cost trade cost. Its relationship to $\tau_{ij,}$ $i \neq j$ reflects the relative cost of crossing a border.

Anderson et al. (2015) model the unobservable bilateral trade frictions τ_{ij} by a standard set of observables in the gravity literature, but extend the standard gravity specification to include a direct measure of the border effect which is possible when data on domestic sales is available for *i=j*:

$$\tau_{ij} = exp\big(1 - SCMTRY_{ij}\big)\big[\beta_1 lnDIST_{ij} + \beta_2 CNTG_{ij} + \beta_3 LANG_{ij} + \beta_4 CLNY_{ij}\big] + \beta_5 SMCTRY_{ij} \quad (5)$$

$lnDIST_{ij}$ is a variable measuring the distance between country *i* and country *j*, $CNTG_{ij}$ is a variable measuring a common border, $LANG_{ij}$ a variable sharing a common language, $CLNY_{ij}$ a variable measuring a shared colonial past. Border effects are measured through $SMCTRY_{ij}$, an indicator variable equal to 1 if *i=j* and zero otherwise. According to Anderson *et al.* (2015), $SMCTRY_{ij}$ has the advantage of being an exogenous variable that picks up all the relevant forces that discriminate between internal and international trade. Under this formulation, frictions apply to international trade while domestic sales are without cost.

This chapter estimates a gravity model for imports to 22 countries from 43 partner countries for 17 services covering the period 2006 to 2012. Using *k* as a subscript to denote different services, substituting (5) into (4) yields the following basic specification:

$$X_{ij,k} = exp\big[\big(1 - SCMTRY_{ij}\big)\big(\beta_1 lnDist_{ij} + \beta_2 Contig_{ij} + \beta_3 Lang_{ij} + \beta_4 Colony_{ij}\big) + \beta_5 SMCTRY_{ij} + \eta_{i,k} + \theta_{j,k}\big] + \varepsilon_{ij,k} \quad (6)$$

$X_{ij,k}$ represents the imports to country *i* from country *j* for service *k*. On the RHS, $lnDist_{ij}$is the log of the distance measured between country *i* and country *j*, $Contig_{ij}$ takes the value of 1 when two countries share a common border and 0 otherwise, $Lang_{ij}$ takes the value of 1 when two countries share a common official language and 0 otherwise, $Colony_{ij}$ takes the value of 1 when two countries share a common colonial past and 0 otherwise. $SMCTRY_{ij}$ is an indicator variable as defined above. Fixed effects are represented by $\eta_{i,k}$, the set of importer dummies varying by type of service and $\theta_{j,k}$, the set of exporter dummies varying by type of service. $\varepsilon_{ij,k}$ is the error term.

To the basic specification can be added the variables that measure the characteristics of services. The way in which characteristics have been measured was presented in chapter 2 and the same characteristics and measures have been carried over to trade costs but applied to a different data set. This enables also further verification of the validity of the approach adopted.

$$X_{ij,k} = exp\big[\big(1 - SCMTRY_{ij}\big)\big(\beta_1 lnDist_{ij} + \beta_2 Contig_{ij} + \beta_3 Lang_{ij} + \beta_4 Colony_{ij} + \beta_5 Tangibility_k + \beta_6 Generality_k + \beta_7 Complexity_k + \beta_8 Experience_k + \beta_9 Mode_k\big) + \beta_{10} SMCTRY_{ij} + \eta_{i,k} + \theta_{j,k}\big] + \varepsilon_{ij,k} \quad (7)$$

Here the coefficients β_5 to β_9 relate to the different characteristics that serve to define a service. $Tangibility_k$ describes the service in terms of its physical characteristics, $Generality_k$ the degree to which a consumer can describe a product, $Complexity_k$ or mental intangibility of a service how easy it is to understand and $Experience_k$ the ease with which the user can evaluate a service prior to purchase. They are each measured on a seven point scale which can vary between 1 and 7. $Mode_k$ assesses whether co-location is usually required between supplier and user to supply a service, and takes the value of 1 when co-location is usually required and 0 otherwise.

Most transaction costs increase with distance. However, for services the distance does not necessarily relate to transportation costs, but more to the cultural, economic and institutional differences that also tend to increase with geographic distance.

An alternative specification of the gravity equation interacts the service characteristics with distance so that it becomes:

$$X_{ij,k} = exp\big[\big(1 - SCMTRY_{ij}\big)\big(\beta_1 lnDIST_{ij} + \beta_2 CNTG_{ij} + \beta_3 LANG_{ij} + \beta_4 CLNY_{ij} + \beta_5 Tangibility_k * lnDIST_{ij} + \beta_6 Generality_k * lnDIST_{ij} + \beta_7 Complexity_k * lnDIST_{ij} + \beta_8 Experience_k * lnDIST_{ij} + \beta_9 Mode_k * lnDIST_{ij}\big) + \beta_{10} SMCTRY_{ij} + \eta_{i,k} + \theta_{j,k}\big] + \varepsilon_{ij,k} \quad (8)$$

3.5 **Data**

Two different data sets have been combined to provide data on trade in services that covers both internal trade in services and cross-border trade. Imports (and exports) of services are available from Eurostat using the EBOPS Balance of Payments classification of trade in services. They cover 22 European countries for the years 2005-2012 for which sufficiently detailed bilateral trade data was available (Table A 3-1 in Annexe). Unfortunately many major EU-15 countries do not report sufficiently detailed trade data either at the level of the individual service level or at the partner level. Missing EU-15 countries are Ireland, UK, Luxembourg, Portugal and Spain. New Member States are well covered with only Malta missing. This is not as surprising as might be expected since these countries built their statistics ex nihilo after the fall of the Berlin wall while the EU-15 countries merely adapted their existing balance of payment figures. This is an important feature of the data set since it permits for the first time to obtain a picture of post-2004 enlargement trade in services.

The World Input-Output Data Base from the Groningen Growth and Development Centre is the source for internal trade in services. Not only does the WIOD provide time series of world input-output tables but the period covered matches that of Eurostat data and all the countries covered by the Eurostat data are also covered by the WIOD. Internal trade is calculated as the sum of domestically produced intermediate consumption and final demand for each service for each country. The NACE Rev2 breakdown of WIOD allows both a much better and a more detailed match with the data on imports and exports of services than the NACE Rev1.1 breakdown in the paper of Anderson et al. (2015).

Services covered are listed in Annexe Table A 3-2. The great majority of these services are B2B rather than B2C. The main services sold cross-border to consumers are contained within the category “travel”. Travel has no direct equivalent with any sectoral classification. For that reason it is not advisable to try to include travel in a data set that matches cross-border trade with domestic sectors. The main advantage of the data set used for this chapter is the disaggregation into 17 services compared to the 12 of Anderson et al. (2015). Based on differences between services in expected trade costs, the disaggregation of transport, communications and business, professional and technical services is particularly important. Data on distance are from CEPII as are those for contiguity, common official language and former colonial ties.

Although data on both exports and imports are available, the gravity equations use only that on imports. In chapter 1, import penetration was identified as very low and the purpose of the gravity equations is to shed light on missing trade in services. Coverage of imports is also wider than that for exports. Land locked countries such as Slovakia are not expected to export services of sea transport but can import them.

The structure of cross-border trade in services has undergone considerable change during the eight year period covered (table 3-1). The decline in the share of the largest group of services, transport, (from 46.6% to 39.5%) was almost entirely matched by the increase in the second largest group, professional and business services, (from 26.2% to 32.9%). Similarly the 0.7% increase in communications and 2.6% increase in the share of computer and information services matched the declines in the share of construction (-0.5%), insurance and financial services (-1.4%) and services to households (-1.2%).

Changes in shares of different services reflect changes in their relative importance. According to Baldwin (2016) international trade has undergone a “second unbundling” driven by information and communication technologies, which have made it possible to coordinate complex activities at distance. As a result, trade is no longer limited to final products but now concerns production chains as well. In order to manage far flung production chains, telecommunications and computer services are essential. Knowledge intensive professional and business services also provide essential input to management of production chains as well as being subject to offshoring themselves.

Table 3-1 Development of shares in imports of services

Service	2005	2008	2012	Change 2005-2012
Sea Transport	11.2%	11.1%	8.3%	**-2.9%**
Air Transport	9.1%	8.3%	7.5%	**-1.6%**
Land Transport	12.7%	13.4%	12.9%	**0.2%**
Auxiliary Transport Services	13.6%	12.9%	10.9%	**-2.7%**
TRANSPORT	*46.6%*	*45.7%*	*39.5%*	***-7.0%***
Postal & Courier Services	0.8%	0.7%	1.3%	**0.5%**
Telecommunications	3.3%	4.0%	3.6%	**0.2%**
COMMUNICATIONS	*4.2%*	*4.7%*	*4.9%*	***0.7%***
CONSTRUCTION	*3.8%*	*4.6%*	*3.4%*	***-0.5%***
Insurance	3.9%	3.4%	2.7%	**-1.1%**
Financial Services	4.6%	4.1%	4.3%	**-0.3%**
INSURANCE & FINANCIAL SERVICES	*8.4%*	*7.5%*	*7.0%*	***-1.4%***
COMPUTER & INFORMATION SERVICES	7.1%	7.7%	9.7%	**2.6%**
Legal, Accounting & Management Services	6.7%	8.2%	9.8%	**3.1%**
Advertising & Market Research	4.5%	5.0%	5.0%	**0.5%**
Research & Development	4.8%	5.7%	7.0%	**2.3%**
Architectural & Engineering Services	4.2%	4.4%	5.7%	**1.5%**
Other Business Services	5.9%	4.8%	5.4%	**-0.5%**
PROFESSIONAL & BUSINESS SERVICES	*26.2%*	*28.0%*	*32.9%*	***6.8%***
Audio-visual Services	3.0%	1.8%	1.8%	**-1.2%**
Other Personal Services	0.8%	0.8%	0.8%	**0.0%**
SERVICES TO HOUSEHOLDS	*3.8%*	*2.6%*	*2.5%*	***-1.2%***

The data set contains 128,656 observations of which 38,550 or 30.0% are zeros. This share is not particularly high and indeed lower than that seen in many data sets for goods. Average value of imports of services from any origin excluding domestic sales was 22.1 million euros with a standard deviation of 102.89 million euros. Only 8% of observations are between countries sharing a common border, 3% sharing a common

language and 3% a common colonial past. 58% of observations and 68% of imports take place between countries within the EEA.

Concerning the characteristics of the services that are traded, they are on average very low in physical tangibility (so intangible) and that in terms of generality and complexity they rank neither very high nor very low since the value is near to the modal value of 4 (neither high nor low on the criteria). Traded services tend on average not to be very searchable but to be high on experience. Finally for 41% of observations some physical interaction between supplier and user will usually be required.

3.6 **Results**

The results from the three different regression specifications applying equations (6) – (8) are presented in table 3-2. Repeated cross-sections at two year intervals provide some possibility to observe changes over time. Two year intervals are preferred in order to address the critique that the dependent variable in gravity estimations with fixed effects cannot fully adjust in a single year's time (Cheng and Wall, 2005). With the Poisson PML form of estimation and an explanatory variable expressed in natural logarithms as is the case for distance, the coefficient can be interpreted as an elasticity. The other coefficients can easily be interpreted directly as semi-elasticities. They measure the proportionate rise in the value of imports of services from a one unit change in the value of the explanatory variable. Thus in the case of a categorical variable such as contiguity, the change from without common to common border between two countries is associated with a 0.6098 increase in the value of imports of services for the basic specification in 2006 or an increase of 60.98%.

The goodness of fit statistics reported at the bottom of the tables support the appropriateness of the model specification and the relevance of distinguishing between the different types of services. The last claim follows from inspecting Schwartz's Bayesian information criterion (BIC) defined as: $-2L_m + m\ln n$ where n is the sample size, L_m is the maximized *log-likelihood* of the model and m is the number of parameters in the model. The index takes into account both the statistical goodness of fit and the number of parameters that have to be estimated to achieve this particular degree of fit, by imposing a penalty for increasing the number of parameters. The smaller the value of BIC, the better the fit. When comparing the basic specification nested within the other two models in which service characteristics are entered, either

directly or interacted with the distance variable, the value of the BIC falls by between one half and one third, indicating that the addition of service characteristics is the better model.

The coefficients from the reference regression, which is representative of a standard gravity equation with exporter and importer fixed effects, are largely in line with similar research[9]. The log of distance is negative and highly significant. However, standard deviations for some of the estimated effects are large. The strong depressing effect of distance for services is surprising. A possible explanation might be the role of physical distance acting as a proxy for administrative, cultural, institutional and economic differences, which may have a depressing effect on trade in services. There is no evidence that the effect of distance on the value of imports of services is declining over time, contradicting the "death of distance" story.

The effect of sharing a common border (contiguity) is positive and significant. Neither sharing a common language, which might be expected to have had a significant effect on cross-border trade in services, nor sharing a common colonial past depress trade significantly. However only 3% of observations share a common language or a common colonial past in this data set while 8% share a common border. This result therefore is somewhat less surprising.

Border effects measured by the smctry variable are always substantial and highly significant. The median coefficient estimate across the twelve regressions is 4.2987, which points to substantial border effects in services trade. Since smctry takes the value of 1 when country *i* is the same as country *j*, the increase in the value of domestic sales compared to imports induced by the border is therefore 429.87%

In the first variant to the reference specification, columns (5)-(8), different characteristics of services are entered as separate trade impacting factors across different bilateral partners. The second variant to the reference specification in columns (9)-(12) makes the impact of service characteristics distance specific by interacting the different characteristics of services with the distance variable. This implicitly tests the hypothesis that impact of distance is moderated by the type of service. This

[9] Since no major differences in standard explanatory variables were found between intra and extra-EEA imports, the regressions presented have concentrated on total imports (Smith, 2017).

specification would be consistent with an interpretation that service characteristics affect the costs of doing business with partners further away.

Country specific service characteristics are picked up by the exporter and importer times service fixed effects. For example, differences in the ability of a country to utilise the potential of information technology to promote trade in services will be picked up in the fixed effects. Differences in regulation will also be picked up in the fixed effects. These gravity equations limit the impact of service characteristics to those that can be considered as common or intrinsic to the service itself, which is the object of the chapter.

Whether the variables representing characteristics of services are entered directly or interacted with the distance variables, coefficients have the same signs and significance levels; only the coefficients change with those interacted with distance substantially lower – as would usually be expected with variables that act as moderators. The consistency across model specification and the improvement of the fit of the models compared to the reference model indicate that service characteristics are indeed a factor influencing trade.

Table 3-2 Results of the Gravity Equations

	(1) 2006	(2) 2008	(3) 2010	(4) 2012	(5) 2006	(6) 2008	(7) 2010	(8) 2012	(9) 2006	(10) 2008	(11) 2010	(12) 2012
log distance	-0.3708**	-0.3788***	-0.3646***	-0.3821***	-0.4014***	-0.3970***	-0.3854***	-0.4032***	-0.3854*	-0.6352**	-0.7026***	-0.7853***
	(0.1204)	(0.0997)	(0.0905)	(0.0959)	(0.1152)	(0.0966)	(0.0880)	(0.0928)	(0.1951)	(0.2083)	(0.1950)	(0.1826)
contiguity	0.6098***	0.6487***	0.7361***	0.7480***	0.5813***	0.6274***	0.7168***	0.7318***	0.5864***	0.6328***	0.7238***	0.7381***
	(0.1745)	(0.1491)	(0.1562)	(0.1519)	(0.1688)	(0.1468)	(0.1552)	(0.1518)	(0.1704)	(0.1479)	(0.1560)	(0.1527)
common language	0.3083	0.3379	0.2652	0.3023	0.3020	0.3426	0.2821	0.3244	0.2979	0.3368	0.2736	0.3151
	(0.2889)	(0.2347)	(0.2137)	(0.2255)	(0.2818)	(0.2325)	(0.2128)	(0.2257)	(0.2831)	(0.2333)	(0.2139)	(0.2267)
colony	0.1928	0.2154	0.0880	0.1437	0.2099	0.2044	0.0724	0.1276	0.2207	0.2142	0.0805	0.1358
	(0.1362)	(0.1304)	(0.1251)	(0.1186)	(0.1515)	(0.1435)	(0.1367)	(0.1294)	(0.1504)	(0.1420)	(0.1360)	(0.1290)
smctry	4.2987***	4.3548***	4.2811***	4.0763***	3.9134*	5.8761***	6.3484***	6.5376***	3.7571***	3.9725***	3.9177***	3.7280***
	(0.8465)	(0.7003)	(0.6424)	(0.6766)	(1.9118)	(1.7588)	(1.4919)	(1.4821)	(0.8184)	(0.6820)	(0.6252)	(0.6570)
Tangibility					-0.0688*	-0.1744***	-0.1910***	-0.2065***				
					(0.0318)	(0.0313)	(0.0384)	(0.0400)				
Generality					0.2145	0.4914**	0.5886***	0.6361***				
					(0.1748)	(0.1524)	(0.1392)	(0.1266)				
Complexity					-0.3212*	-0.0795	0.0025	0.0516				
					(0.1395)	(0.1269)	(0.1136)	(0.1026)				
Experience					0.1360	0.1343	0.1067	0.1106				
					(0.0844)	(0.0832)	(0.0743)	(0.0776)				
Mode					-0.8998***	-0.4523***	-0.2402	-0.1345				
					(0.1428)	(0.1083)	(0.1457)	(0.1285)				
Tangibility #log_distance									-0.0100*	-0.0266***	-0.0292***	-0.0315***
									(0.0048)	(0.0049)	(0.0060)	(0.0062)
Generality #log_distance									0.0283	0.0691**	0.0842***	0.0923***
									(0.0252)	(0.0242)	(0.0223)	(0.0208)
Complexity #log_distance									-0.0526**	-0.0169	-0.0043	0.0037
									(0.0196)	(0.0198)	(0.0177)	(0.0166)
Experience #log_distance									0.0188	0.0186	0.0141	0.0148
									(0.0132)	(0.0129)	(0.0118)	(0.0121)
Mode #log_distance									-0.1375***	-0.0703***	-0.0394	-0.0214
									(0.0211)	(0.0166)	(0.0220)	(0.0193)
Exporter and Importer*EBOPS fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
constant	1.1209	1.4344	1.2081	1.3729	1.3208	-0.2023	-0.9419	-1.1613	1.4665	1.6959*	1.4842*	1.6447*
	(0.9426)	(0.8283)	(0.7443)	(0.8730)	(1.9301)	(1.7895)	(1.5182)	(1.5677)	(0.8752)	(0.7704)	(0.6991)	(0.8231)
N	12646	13876	13534	13498	12646	13876	13534	13498	12646	13876	13534	13498
BIC	335550.5	420684.2	430276.5	472148.9	243824.87	329516.21	345393.86	383033.28	246299.87	332356.3	347733.61	386403.71
AIC	151292.1	218372.9	232994.4	275325.3	59535.878	127189.65	148081.13	186224.99	62041.448	130029.74	150466.74	189564.85

Standard errors in parentheses

* p<0.05 ** p<0.01 *** p<0.001

Hypothesis 1 that services that are higher in experience will depress trade in services is not supported by the results. The positive coefficient of the gravity equations indicates that services that are more heavily traded are more rather than less likely to be high in experience. However the coefficients are not significant in any of the different years. It should be mentioned that over two thirds of services in the data have a value of 6 or higher indicating that most services are very high in experience and this variable may not be very discriminating.

Hypothesis 2 that complexity depresses trade in services is only partially supported. Thus services which are simple to understand (Generality) act to increase trade in services. Each one point increase in Generality is associated with an increase of between 21% and 64% in the value of imports of services for the basic specification. Services that are more complex begin by decreasing the value of trade as expected by 32% for each one point change, but the effect lessens over time so that by 2010 the coefficient becomes positive but not significant. The increasing share of professional and business services in total trade in services would tend to support this since they are generally high in complexity.

Hypothesis 3 that services that require simultaneous physical presence of both supplier and user will depresses trade in services is supported but the size and significance of the coefficients sharply decline over the period so that the change from importing without a requirement for co-location to one requiring co-location is associated with a decrease in the value of imports of services of 90% at the beginning of the period and 13% at the end.. This again could be linked to the increasing share of professional and business services.

Hypothesis 4 tests whether physical tangibility acts to facilitate or hinder cross border trade in services. Physical tangibility acts to depress trade in services rather than to facilitate it. Each one point increase in tangibility is associated with a decrease of between 7% and 21% in the value of imports of services. This directly contradicts received wisdom about services and international trade - Hypothesis 4a. – but supports Hypothesis 4b, implying that it is the capacity of some services to be stored and transported as intangible goods that is more important than the physical tangibility of a service for trade in services. The rising share of computer and information services would be compatible with this finding.

3.7 **Conclusion**

The inclusion of variables that describe the major different attributes of services improves the overall fit of gravity equations and provides additional insights into the reasons behind the variation in cross-border trade between different types of service and different partners in trade. The results are consistent across different specifications. A declining importance of the requirement for physical co-location between supplier and user can be observed over time, which would need to be confirmed in further studies and those that identify any changes in the inherent characteristics of different services.

Information technology has the ability to address two of the features of services that are believed to depress cross-border trade in services, the need for physical interaction between supplier and user of a service that leads to co-location and the possibility to store and transport intangible services at low cost over the internet. This chapter sheds light on the degree to which important characteristics of services continue to influence trade in services when conducted across borders as opposed to via permanent presence.

Good quality data on trade in services remains sparse, particularly at the level of the individual service. Availability of FATS data on the operations of service multinationals is only beginning to appear on a consistent basis. Combining different sources relating to cross-border trade and permanent presence remains fraught with difficulty. An integrated explanation for trade patterns that covers the different forms in which services are traded is hampered by the lack of data, which is exacerbated at the level of individual firm data. Much remains to be explained with regard to trade in services.

Annexes

Table A 3-1 Country coverage of the data

Sample Countries	Partner Countries	
Austria (EU-15)	Austria (EEA)	Italy (EEA)
Belgium (EU-15)	Australia	Japan
Bulgaria (NMS)	Belgium (EEA)	South Korea
Cyprus (NMS)	Bulgaria (EEA)	Lithuania (EEA)
Czech Republic (NMS)	Brazil	Luxembourg (EEA)
Germany (EU-15)	Canada	Latvia (EEA)
Denmark (EU-15)	Switzerland	Malta (EEA)
Estonia (NMS)	China	Mexico
Greece (EU-15)	Cyprus (EEA)	Netherlands (EEA)
Finland (EU-15)	Czech Republic (EEA)	Norway (EEA)
France (EU-15)	Germany (EEA)	Poland (EEA)
Croatia	Denmark (EEA)	Portugal (EEA)
Hungary (NMS)	Estonia (EEA)	Romania (EEA)
Italy (EU-15)	Greece (EEA)	Russia
Lithuania (NMS)	Spain (EEA)	Sweden (EEA)
Latvia (NMS)	Finland (EEA)	Slovenia (EEA)
Netherlands (EU-15)	France (EEA)	Slovakia (EEA)
Poland (NMS)	Croatia	Turkey

Sample Countries	Partner Countries	
Romania (NMS)	Hungary (EEA)	Taiwan
Sweden (EU-15)	Indonesia	United Kingdom (EEA)
Slovenia (NMS)	Ireland (EEA)	United States
Slovakia (NMS)	India	
N=22	N=43	
NMS New Member State	EEA European Economic Area	

Table A 3-2 Services coverage of the data

TRANSPORT	Sea Transport	Air Transport	Land Transport	Auxiliary Transport Services	
COMMUNICATIONS	Postal and Courier Services	Telecommunications			
CONSTRUCTION					
FINANCIAL SERVICES	Insurance	Financial Services			
COMPUTER AND INFORMATION SERVICES					
PROFESSIONAL SERVICES	Legal, Accounting and Management Services	Advertising and Market Research	Research and Development Services	Architectural and Engineering Services	Other Business Services
HOUSEHOLD SERVICES	Audio-visual Services	Other Personal Services			

Chapter 4.
WHO MAKES ONLINE PURCHASES FROM OTHER COUNTRIES? AN EMPIRICAL ANALYSIS OF THE CHARACTERISTICS OF CROSS-BORDER E-BUYERS IN EU COUNTRIES

4.1 Introduction

Import penetration for services remains low with only 6% of EU markets served by imports. While data on the supply of services has recently improved with Eurostat's annual surveys of enterprises, less is known about the demand for services particularly from the point of view of consumers. Equally barriers to the supply of services, particularly regulatory barriers, have been extensively researched while non-regulatory barriers that come from the demand side have received less attention. Purchasing over the internet provides the potential for consumers to deal directly with suppliers, unlike offline purchasing which takes place through intermediaries and where it is not possible to distinguish between domestic and foreign suppliers (Martens, 2013). Thereby it enables a direct observation of consumer behaviour in a way that is not possible with offline purchases.

Consumers in Europe are increasingly using the internet to make purchases of goods and services online. According to the 2016 Eurobarometer survey on consumers' attitudes towards cross-border trade and consumer protection, the average proportion of consumers who shop online in the EU-28 is now 76.0% (table 4-1). Internet shopping provides many benefits including the convenience of being able to shop from home, ease of price comparisons and the ability to gather a much wider range of information on a projected purchase.

Table 4-1 Share of consumers who purchase online

In the past 12 months, have you purchased any goods or services via the Internet?

		Percentage change over previous period						
EU28	2016	2016-2014	2014-2012	2012-2011	2011-2010	2010-2009	2009-2008	2008-2006
all	76.0%	10.7	2.9	5.6	19.6	-0.5	4.1	6.7
domestic	67.4%	9.2	3.1	3.6	18.3	-0.2	3.4	7.1
EU cross-border	18.9%	-0.7	1.8	5	5.2	-0.3	0.3	1.7
non-EU cross-border	8.4%	-2.5	1.3	2.4	3.6	-0.3	0.1	0.8

Source: 2016 Eurobarometer survey on consumers' attitudes towards cross-border trade and consumer protection

Consumers have the choice whether to purchase from a supplier located in their own country, within the EU or outside the EU. In 2016, 67.4% of consumers purchased goods or services domestically, 18.9% cross-border from EU-based retailers or service providers and 8.4% cross-border from retailers or service providers located outside the EU. While the numbers purchasing online have been increasing, they have been driven by domestic purchases rather than from cross-border purchases.

Within an integrated internal market it would be expected that consumers should be indifferent where they purchase their goods and services. The much lower rate at which consumers are purchasing cross-border than from domestic suppliers within Europe calls for an explanation.

This chapter examines the probability that people who buy online will make a cross-border purchase. Those that purchase online cross-border are compared with those that purchase exclusively from domestic suppliers, irrespective of whether those that make an online cross-border purchase also purchase online from domestic suppliers. With a focus on cross-border purchases, this chapter makes several contributions by answering the following two questions: 'To what extent do determinants of domestic online purchasing extend to or differ from the decision to purchase cross-border?', and 'How do country-specific variables impact the decision to purchase cross-border?'.

A purchase decision is one of individual choice and the chapter takes the perspective of the purchaser. Some of the factors that determine the decision to purchase cross-border online will be specific to that purchaser and have a common effect irrespective where the individual is living. However, some of the factors that influence the purchase decision are shaped by the social environment proper to the country in which the purchaser lives. Many more factors than are usually measured affect the purchase decision and therefore the degree of market integration finally achieved. Hence, both the measured individual specific characteristics and the wider country specific variables are required in order to adequately reflect the different factors that can influence whether a consumer decides to purchase cross-border or not.

4.2 Conceptual framework

The decision to purchase online cross-border depends on the associated costs and benefits and the utility derived from it compared to the alternative of buying online

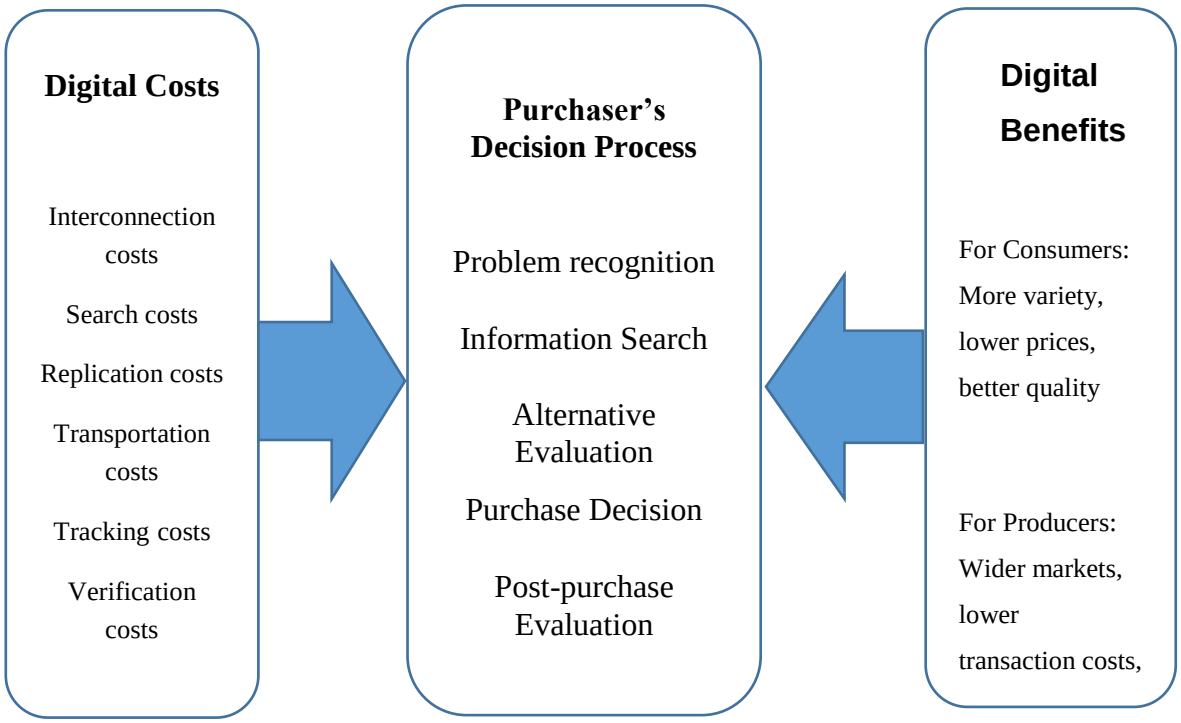
domestically. Digital technology has the potential to substantially reduce costs and provide new benefits compared to traditional bricks and mortar outlets. A simple model of purchasing behaviour by consumers takes the decision process through several stages (fig. 4-1). Going through the stages of the purchase decision, problem recognition is the beginning of the purchase process. It occurs when the consumer decides they wish to acquire a good or service in order to satisfy some unmet need or want. It is followed by information search and evaluation phases. Consumers evaluate alternatives in terms of the benefits they provide and the degree to which they meet the need identified at the beginning of the process. The purchase decision is the most commonly observed part of the purchase process and the one that translates intentions into hard cash. Purchase intent and actual purchase are related but separate parts of the purchase decision. Post-purchase evaluation can be important in determining future purchase patterns and creating confidence in a product or supplier.

The internet has the capacity to influence all the different stages in the buying process in a significant way. Fixed and mobile platforms connected to the internet allow much greater freedom of accessing information and communicating with others generating a need for connection that was previously unknown and unrealised. The information search function has been facilitated by access to much richer sources of information about available goods and services, including those previously unavailable at the consumer's location. On-line reviews facilitate evaluation, complementing traditional means such as word-of-mouth. Purchasing on-line both allows for a wider range of possible purchases and makes it simpler to buy by obviating the need for a visit to the store. Post-purchase evaluation is also fostered by the ability to compare users' experience with others even at a considerable distance.

The nature of digital costs and how they affect the different stages of the decision process are crucial to understanding the consumer's ultimate decision on where and what to purchase. Taking these different kinds of costs in order, interconnection costs are incurred in order to engage in activity on the internet. They bring immediate benefits in terms of the ability to communicate with others without the restriction of distance, of providing the consumer with much more extensive sources of information and of course the ability to purchase online. The economics of interconnection costs is quite complex (Laffont, Marcus, Rey & Tirole, 2003). From the point of view of the consumer, internet access will be a pre-condition for any purchase and most of that time internet

access will be acquired with a personal subscription to an internet provider. The cost and associated quality in terms of download and upload times will affect the willingness to envisage going down the online route for purchasing irrespective of whether that results in a purchase or not. From the point of view of the supplier, internet connection costs can affect whether or not they are able to provide a quality experience for those browsing online. Interconnection costs can be measured as the cost of broadband for a specified amount of data access.

Figure 4-1 The Purchase Decision Process



The internet should reduce search costs by making it easier to find and compare information about potential purchases. As a result it should reduce prices and increase variety. There is evidence that both of these have occurred, although perhaps not as much as might be expected (Goldfarb & Tucker, 2017). Companies have the ability to shape the search process by making search faster or slower and the ability to compare prices easier or more difficult (for example by adding VAT, delivery and other charges later in the browsing process). By doing so they affect the outcome in terms of whether and what the consumer ultimately decides to purchase. Consumers do not appear willing to undertake extensive search for a product even when this is costless, indicating rather that the consumer's time should also be factored into the search

process. Nor do consumers always buy at the lowest price after search. In a study of online book purchases, around 36% of consumers do not buy from the lowest price store that has been searched (De Los Santos, Hortasu & Wildenbeest, 2012). Quality of the search experience and of the supplier also matter.

While search costs are obviously important at the beginning of the purchase decision process by providing consumers with information that may generate previously unrecognised needs (Problem recognition) as well as the acquisition of the relevant information for making a decision (Information search), they continue throughout the purchase process. The evaluation of alternatives may well give rise to additional search, for instance for online reviews of a product, as well as at the post-purchase evaluation phase to confront the experience of other consumers of the good or service with one's own. Lower search costs for online purchases therefore have the potential to affect the purchase decision in multiple ways.

Replication costs of digital goods are zero or at least very low compared to non-digital ones. However, according to Goldfarb & Tucker the distinguishing feature of digital goods is not that they have zero marginal cost but that they are non-rival. They can be consumed by one person without reducing the amount available to others. This has led to the creation of bundles of online content in the form of subscription services for streaming and downloads. Purchasing these bundles for many users represents a cost effective replacement for listening to or viewing material in physical form (a CD or going to the cinema). It also displaces other forms of viewing such as advertising or publicly financed broadcast programmes as well as piracy. Replication costs therefore affect mainly the purchase decision.

Related to replication costs, transportation costs of information over the internet are close to zero. This has several aspects. The first relates to the difference with information acquired through other means. The second relates to the difference between digital services that can be consumed online compared to goods that still need to be delivered to the purchaser. The third relates to distance, where the cost of information acquisition is no longer linked to distance. This should mean that the benefit of purchasing online should be greatest for those who live furthest from offline stores. The fact that consumers located in rural areas are less likely to purchase online than residents of urban areas, and contrary to other forms of distance selling by

telephone or mail order, is a subject worth exploring (Cardona, Duch-Brown & Martens, 2015). For consumers, transportation costs of goods can be lower than the cost of going out to purchase them. This occurs because goods are delivered to them and it can make sense for consumers to buy in bulk rather than carrying things themselves. Low cost of transmission over the internet obviously is an important element contributing to low search costs so that they are again influential directly or indirectly throughout the purchase process.

Tracking costs are a form of cost that has led to behaviour specific to the digital economy. Because digital activity is easily recorded and stored, the resultant reductions in tracking costs enable personalisation. In theory the ability to track an individual's past behaviour should make first degree price discrimination easier, although there is limited evidence for this (Acquisti, Taylor & Wagman, 2016). Instead low tracking costs have been extensively used to develop targeted advertising that is used to finance free to user services such as search engines and social media. Consumption of online material is therefore furthered by the way that tracking enables advertising funded services. Since reception of targeted ads occur most often during the search and evaluation phases, those are the ones most likely affected.

Verification costs are linked to the ability to build on the experience of previous buyers and sellers to overcome asymmetric information about quality and trustworthiness. Examples are online rating systems and user reviews of different products. Platforms such as Ebay and aps such as Uber and AirBnb use positive and negative feedback to weed out suspect sellers or poor clients. By doing so they are able to build trust and lower costs associated with online purchasing. They are particularly effective in doing so cross-border where the seller and client are less likely to have direct knowledge of one another. Social media enables widespread communication of complaints and by doing so lowers cost both in the pre- and post-purchase evaluation phases. Lower verification costs mean that market mechanisms are able to supplement and even replace certain forms of regulation in the digital economy.

The principal benefits of purchasing online from the point of view of the consumer relate to increased price competition, increased variety and lower transaction costs. The effect of increased price competition however may be reflected in overall lower prices for offline as well as online prices rather than in lower prices online compared to offline

(Martens, 2013). Real costs of transactions are lower online because of reductions in search costs. However, residual costs of transactions relate to uncertainty and consumers' perceptions of risk, which can be an important disincentive to purchase online.

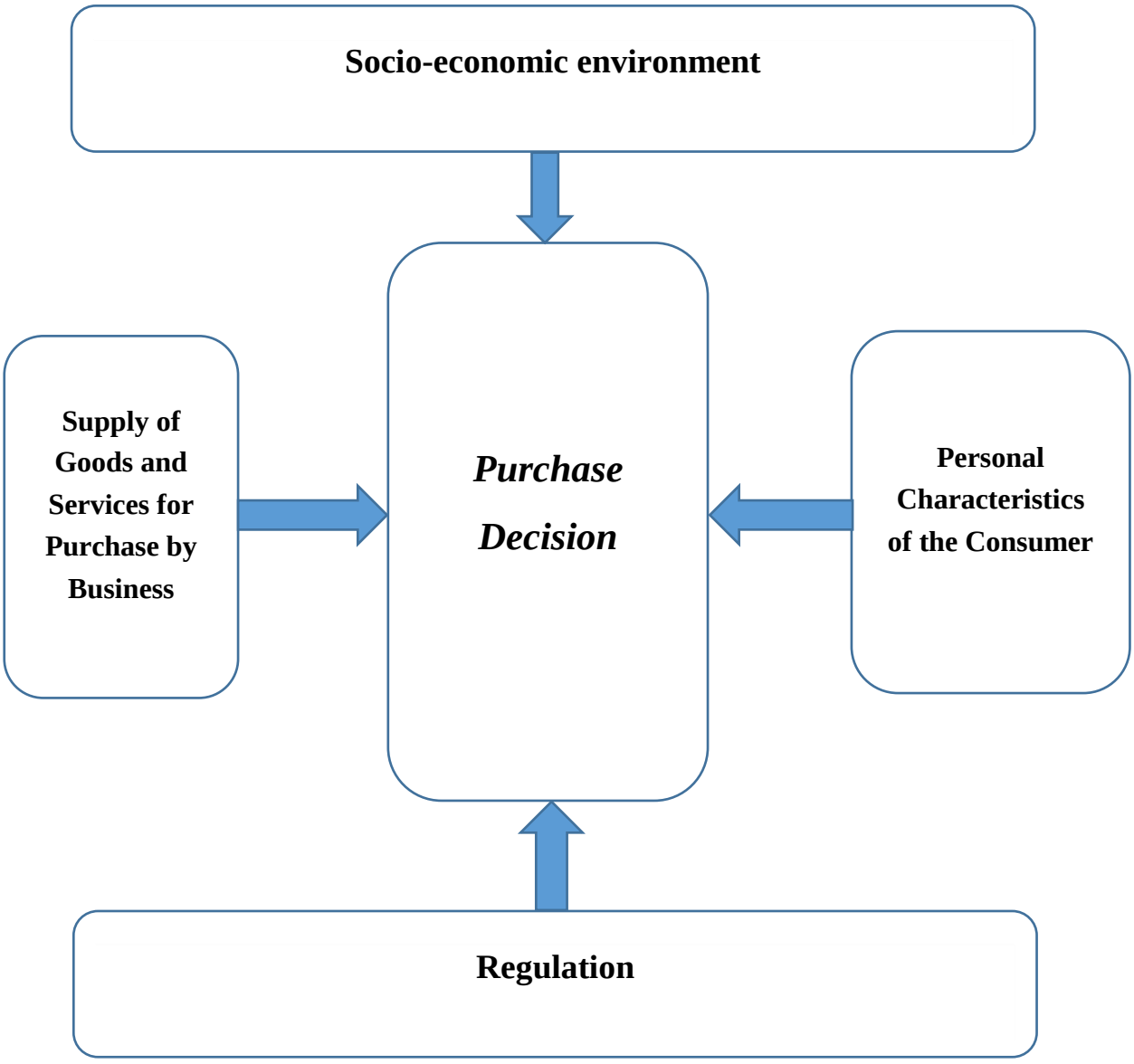
A survey of consumer perceptions of cross-border e-commerce found that lower prices, more variety and lower transactions costs all played a positive role in the overall decision to purchase online. For cross-border purchases, the quality element was decisive. Trust variables were found to have a significant negative impact on online purchases, both overall and cross-border (Cardona et al, 2015). While overall costs should be lower for purchasing online whether domestically or cross-border, certain costs can be higher. Delivery costs for goods ordered online will likely be higher than those purchased in person because individual packages are more costly to deliver than in bulk. Cross-border delivery costs are higher than for domestic packages thus adding an additional cost when purchasing cross-border. Communication costs in terms of language and cultural distance should also be higher when purchasing cross-border compared to purchasing domestically. These costs are not borne when a consumer purchases an imported good or service from a domestic offline supplier.

The benefits and costs described above imply that many factors determine the purchase decision even after limiting them to those that affect online purchases and more particularly those that affect cross-border ones (fig. 4-2). These determinants may act to facilitate online purchases or on the contrary act as impediments. Some of these are specific to cross-border purchases and these will be dealt with separately. Others are more general and will also impact the willingness to connect to the internet and to purchase online domestically as well as cross-border.

The net benefits from purchasing cross-border and each of the distinct stages of the purchase decision are influenced by a set of factors that are either intrinsic to the purchaser or are set by the external environment of each buyer. Obviously, purchasers will be most interested to find lower prices for the good or services they intend to purchase. Hence, we can expect to see more cross-border purchases in countries where prices are high compared to the EU average. However, each of the other socio-economic variables affects differently price sensitivity, value of having more varied product offerings and transaction costs, acting either to increase or to dampen the

benefits of purchasing online compared to offline and if so to also purchase cross-border rather than exclusively domestically. The experience of purchasing cross-border can be considered as qualitatively different from purchasing domestically. It brings into contact consumers with suppliers from different cultural backgrounds, operating in different institutional contexts and with less possibilities of gathering information.

Figure 4-2 Determinants of the Purchase Decision



There is a strong interrelationship between the personal characteristics of consumers and the socio-economic environment in which they make decisions about purchasing. In order to purchase online the consumer must have access to the internet, usually through a fixed or mobile device owned by the individual. Internet access must however

be available in that locality, which is determined by the state of infrastructure, in particular the availability of broadband. As with any new technology, take up of internet access will disproportionately favour those who perceive the usefulness of the innovation and who have the technical and financial means to adopt. In turn the individual's education and income will depend to a great extent on the country in which he or she lives as will their occupation. A decision to purchase and if so whether from a domestic supplier or cross border is influenced by the range of products on offer, itself a function of the size of market which is determined by the environment and not the individual.

Trust has an important role to play at different stages of the purchase decision because it is related to riskiness. Since purchasing cross-border is inherently more risky than purchasing domestically, it is to be expected that trust will play an even higher role in the willingness to purchase cross-border than domestically. To adopt new technology involves a certain amount of risk, and the degree to which the individual is willing to undertake that risk will depend to an extent on whether he or she believes that the provider of the technology is trustworthy. Risk is also involved at the pre-purchase stage of the purchasing decision. There are many different types of risk involved which makes it all the more important to deal with. They include financial risk (the potential for loss), performance risk when the product does not perform as expected, social risk associated with a loss of status as a result of the purchase and psychological risk with loss of self-esteem. Shopping around and extensive information searching and evaluation of alternatives both of the good or service involved and the supplier are typical risk reduction strategies. Thus, at the time of the purchase decision itself, trust in both the product sold and the provider become important, all the more so when the origin of the seller is from another country.

Trust itself between unrelated individuals is not itself a natural state but must be created (Seabright, 2010). It is usual to make a distinction between political and social trust; the first relating more to the public institutions of a country and the second to the degree to which an individual will possess interpersonal trust between citizens. Social trust is often measured in surveys through the question "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?". While this is not the only or even the best way to measure social trust, it is commonly found in surveys such as the World Values Survey, the European Social

Survey or special Eurobarometers in 2009, 2010 and 2014 and is therefore widely available for a large number of countries (Palmans, 2015).

According to the European Social Survey there are two broad schools of thought about trust. The first takes the view that trust is an individual property and that it is associated with individual characteristics, either core personality traits, or individual social and demographic features such as class, education, income, age, and gender. The second argues that social trust is a property not of individuals but of social systems. According to this view the study of trust requires a top-down approach that focuses on the systemic or emergent properties of societies and their central institutions. The two are not necessarily mutually exclusive.

Quality of governance, as measured for instance by the World Bank, can be expected to be linked with trust in institutions. Both governance and cultural traits can be linked to the provision of public goods and levels of socio-economic development as measured for instance by the Human Development Index.

Culture defined as a system of norms, values and attitudes is most often measured by a set of questions that are asked in surveys of individuals, just like trust (Hofstede, 2001; Schwartz, 2006). Cultural distance has been found to be an important determinant of the willingness to purchase certain types of service which do not depend on distance (Blum & Goldfarb, 2006). It relates to the cognitive fit between the purchaser and what is purchased, a separate issue from trust. To measure cultural distance, however, requires bilateral data on the purchases made by the consumer.

The literature on how fragmentation along cultural, ethnic, linguistic or religious lines affects economic outcomes including the provision of public goods like education and health is quite extensive (Alesina, Baqir & Easterly, 1999; Fearon, 2003; Desmet, Ortuño-Ortín & Wacziarg, 2012; Spolaore & Wacziarg, 2015; Spolaore & Wacziarg, 2016; Iyer, 2016; Desmet, Ortuño-Ortín & Wacziarg, 2017). Less extensive is that on the link between culture, governance quality and socioeconomic outcomes (Gaygisiz, 2013).

In terms of purchasing behaviour, one can expect trust enhancing institutions and cultural traits to promote on-line purchasing. Usually consumers are more willing to trust suppliers in their own country and only high trust individuals will be willing to purchase cross-border. However in very low trust countries consumers may have more

trust in foreign suppliers than in those of their country. Following the literature on fragmentation, countries that are culturally or ethnically diverse could be expected to have less trust and therefore act to depress purchases. Linguistic fragmentation by promoting multilingualism might be expected rather to promote the willingness to purchase cross-border.

There is considerable overlap between different country level indicators so that ascribing a particular outcome to one or other factor becomes very difficult. Indeed culture and institutions evolve jointly (Bisin & Verdier, 2017). It is possible to generate an average inter-personal trust indicator from responses by individuals to questions on trust. Such responses generate very consistent results across time and between different surveys. Nordic countries and the Netherlands are found to have very high levels of inter-personal trust. Other countries in north-west Europe are also found to display high levels of inter-personal trust, albeit not has high as those found in Nordic countries. With few exceptions countries in southern Europe and in the former centrally planned countries display much lower levels of trust.

Quality of governance indicators, linked to institutional trust, particularly corruption, follow a similar pattern. It might be thought that legal systems would have a considerable influence on the rule of law. Five different private law legal systems can be distinguished within Europe: a Napoleonic code based roman law system, a German legal family related to the Napoleonic code group, a common law family, a Nordic legal family and former communist-governed states (Hertel, 2009). With the exception of the Napoleonic code countries which cover Belgium, Luxembourg, France and most southern European countries with the exception of Greece and Cyprus, legal systems reflect quite well also the levels of inter-personal trust as well as different levels of governance but these may be linked to other factors. To take another example, each European country built its social welfare system differently but several families of welfare can be identified, a social-democratic or Nordic system, a liberal or Anglo-Saxon system and a Christian democratic or Bismarkian system in continental Europe to which can be added a southern European family based system (Esping-Andersen, 1990). These systems reflect cultural preferences and political realities when they were built but also go to shape the way in which the individual citizen interacts with public institutions and thereby the degree of satisfaction with existing arrangements.

In order for consumers to want to purchase online and overcome the habit of going out to shop, there must be a wide selection of goods and services on offer preferably at competitive prices. The share of firms selling online in the EU-28 has been increasing but remained at the relatively low level of 18% in 2016 up from 13% in 2010. Large companies as expected are more likely to sell online (38%) than small companies (16%). The share of large companies selling online has also increased faster than that for smaller ones. Accommodation is the sector with by far the highest share of firms selling online (65%) followed by distribution, information and communication and the ICT sector all with shares in the low twenties.

Availability of the necessary infrastructure, in particular broadband coverage and speeds are a factor limiting the ability to trade online for both companies and consumers, particularly in remote and rural areas. Many of the impediments to the ability or willingness of companies to sell online stem from different forms of regulation. Particularly for small companies general regulation on entry and the capacity of public administrations to apply existing regulation fairly and effectively can limit the pool of potential suppliers. The World Bank's Doing Business indictors provide much information on those types of barriers. Restrictive labour regulations can make it more difficult to quickly scale up a successful business after entry taking advantage of the lower costs of online selling compared to a physical presence or on the contrary to adjust to a slower take up by consumers of the online presence. The OECD has now built up quite a track record of monitoring labour regulations.

Consumers are worried that the personal information that they provide online could be the subject of unauthorised use or diffusion. This has led to regulation that is regularly revised and updated, most lately in the case of the EU in 2016 replacing previous regulation from the 1990s (EU 2016). Such regulation imposes costs on business but also can increase confidence in using the internet to make purchases, particularly when purchasing cross border within Europe.

The economics of privacy are not as straightforward as the desire to comprehensively regulate the data that consumers place online would suggest. Individuals can benefit from protecting the security of their data to avoid the misuse of information they share online. However they also benefit from the sharing of information with others that results in mutually satisfactory interactions (Acquisti, Taylor & Wagman, 2016). For

organisations too there are trade offs related to data use. By tracking use companies can better tailor their offer of goods and services to customers but they can also alienate them by practices that are deemed too invasive. The implicit trade offs for consumers has led to an apparent dichotomy between privacy attitudes and privacy behaviours (Berendt, Gunther& Spiekermann, 2005). Thus at the same time as consumers profess a need for privacy, most consumers remain avid users of information technologies that track and share their personal information with unknown third parties (Acquisti et al, 2016).

Trade offs are implicit in other areas of e-commerce such as the right of return of purchases within a specified time frame. The EU Consumer Rights Directive provides this possibility which already existed under previous distance selling legislation (EU, 2011). Right of return provides security for consumers that the purchase they receive is what they intended or what they need. It entails a cost of business but encourages consumers to purchase online. Regulation can thus generate both additional costs and also additional security which may encourage recourse to online purchasing. However the costs and benefits are not distributed symmetrically across suppliers and consumers. Costs of regulation are borne particularly by SMEs for which they represent a much greater share of total costs than for large online suppliers. Equally it is those consumers that feel least confident in online purchasing that are likely to benefit most from regulations designed to protect them from abuse even though these are least likely to be active in purchasing online.

The previous discussion applies equally to domestic and cross-border purchases. Consumers however are much less willing to purchase cross-border than for domestic suppliers. Lack of willingness to purchase cross-border can be attributed to barriers that raise the cost of international purchases or make it more difficult to purchase cross-border compared to domestic suppliers. A number of advantages of cross-border e-commerce should however encourage such purchases and compensate at least in part the additional costs. At the level of search and evaluation, it has become easy to compared prices across countries, particularly within the euro zone. The amount of information available on foreign sites dwarfs that which is available domestically. At the purchase decision phase variety and availability play an important role in addition to possible cost savings from lower prices. These are particularly significant for

consumers in small countries where there may be limited supply and lack of domestic competition forces up prices.

A number of barriers specific to cross-border e-commerce have been identified which act to depress either the ability to sell or the willingness to purchase cross-border (Coad & Duch-Brown, 2017). First amongst these from the seller point of view is taxation. Value added tax impacts negatively the ability to sell online particularly for many small companies. The original intention in the White Paper on Completing the Internal Market of 1985 was for VAT to be levied at the rate of the sending country and not of that of the receiving country. This intention has always been vigorously resisted by Member States and in the latest proposals it has been definitively dropped (European Commission, 2017). In the US, the contrary situation existed up to the Supreme Court decision in South Dakota v. Wayfair in which sales tax was not levied on out-of-state purchases – a considerable advantage for online retailers over bricks and mortar outlets.

Sectoral regulation of telecommunications for all firms and postal services for suppliers of goods who need to ship parcels to clients can impact the ability to sell online negatively. The OECD also has long series of product market regulation for both of those sectors. Increasingly consumers are using mobile devices to access the internet and to undertake the different phases of the purchase decision including ordering online. However mobile spectrum is allocated on a country by country basis and there are effectively 30 different markets for mobile services in the EEA (Mariniello & Salemi, 2015). The result is less competition and more complications when moving around and making cross-border purchases. Currently the multiplication of networks leads to double mark ups when more than one network is needed to provide a service. Regulating roaming charges for calls and data downloading attacks the symptom and not the cause, which is lack of competition resulting from market fragmentation.

Delivery costs for parcels which are much higher when purchasing cross-border than domestically has been identified as an important factor limiting such purchases (IPC, 2010; Claes & Vergote, 2016; Okholm, Boivie, Wahl, Jensen, Nygard & Basalisco, 2016; Borsenberger & Chever, 2016; Marcus & Petropoulos, 2016; Duch-Brown & Cardona, 2016; Coad & Duch-Brown, 2017). According to Duch-Brown & Cardona removing delivery cost concerns would increase the overall number of firms selling

online cross-border compared to 2015 by 6.2 percentage points. From a mystery shopping experiment by Copenhagen Economics, it appears that e-retailers' pricing of delivery services is highly commercial, and that the prices charged often do not reflect the prices charged by the delivery operators. Nevertheless, public cross-border prices charged by universal service providers are up to five times higher than the domestic equivalent. Some of the difference between domestic and cross-border prices can be attributed to lack of inter-operability of tracking systems or longer distances to be transported (Pletinckx, 2014). However as for telecommunications lack of competition between previous national monopoly postal operators and market fragmentation represent a more plausible explanation for these high prices.

The European Commission proposed a regulation on cross-border parcel delivery services in 2016 to address this issue; a proposal that has reached the stage of provisional agreement by the European Parliament, the Council and the Commission. The proposal aims to increase price transparency by allowing users to easily compare domestic and cross-border tariffs and enhanced regulatory oversight. Again these measures address the symptom rather than the cause and could even prove counter-productive if consumers decide that they are better off purchasing domestically to reduce delivery costs.

Consumers find geo-blocking when they are unable to complete a purchase because the seller refuses to allow the purchase from another Member State one of the most frustrating aspects of cross-border e-commerce. The fact that geo-blocking often only occurs at the end of a lengthy purchase procedure adds to the frustration. As with prices for delivery cross-border, geo-blocking can arise either as a commercial strategy on the part of the manufacturer, the retailer or both or as a result of regulation. The Commission's E-commerce sector inquiry has substantial treatment of the different forms of geo-blocking and reasons behind it (European Commission, 2017). Retailers cite additional costs particularly for translation of the website and targeted advertising and marketing as a reason not to sell cross-border. The report indicates that the proportion of respondents that do not sell cross-border is typically lower for larger online markets, such as France and Germany, compared to smaller markets, such as Belgium, where retailers reported to focus more on national sales. This is the opposite to what would be expected and also the opposite to consumers' purchases cross-border which are higher in the smaller markets. Firms in countries with smaller markets

obviously limit their growth possibilities more than those in larger countries by restricting themselves to the domestic market.

Retailers may be under contractual cross-border sales restrictions imposed by their suppliers. One of the reason for this would be to price discriminate according to the size or income of the market. Large differences in prices within the Single Market have been observed, particularly but not exclusively for services. Since one of the advantages of online purchasing is to compare prices across countries, geo-blocking acts to negate that advantage and to restrict the potential of the Single Market from the consumer point of view. In 2016 the European Commission presented a proposal on geo-blocking on which the European Parliament, the Council and the Commission have reached a political agreement (European Commission, 2016). The Regulation does not impose an obligation to sell and does not harmonise prices. Instead the measures involved are quite modest covering only three specific situations of minor importance:

- The sale of goods without physical delivery. Example: A Belgian customer wishes to buy a refrigerator and finds the best deal on a German website. The customer will be entitled to order the product and collect it at the trader's premises or organise delivery himself to his home.

- The sale of electronically supplied services. Example: A Bulgarian consumer wishes to buy hosting services for her website from a Spanish company. She will now have access to the service, can register and buy this service without having to pay additional fees compared to a Spanish consumer.

- The sale of services provided in a specific physical location. Example: An Italian family can buy a trip directly to an amusement park in France without being redirected to an Italian website.

Regulation can be used to remove barriers to cross-border sales or to impose them. In principle geo-blocking can be imposed even within the territory of a country. For instance in the US certain states restrict online gambling and require that their residents be prevented from doing so. For digital content such as films, music or games, geo-blocking is pervasive and requires subterfuges such as VPN connections to circumvent restrictions on accessing content outside the prescribed geographic

area. Territorial restrictions are pervasive because digital content is copyright protected and licensing of rights takes place on a geographical basis. Copyright like other forms of intellectual property is protected by regulation, even in the case of the US by the constitution. It would require regulation to enforce a requirement that within the Single Market rights be licensed to cover the entirety or a part thereof. The Commission has renounced this possibility after for a moment entertaining it.

The conceptual framework outlined above calls for a comprehensive empirical strategy which considers personal as well as socio-economic characteristics of the environment in which the individual is living. So far, the diversity of factors and their relative importance in the decision to purchase cross-border online has not been subjected to sufficient empirical testing. Recent Eurobarometer data on cross-border purchases allow us to go in that direction. After presenting the data in the next section, we develop and test an empirical model which is directly derived from the framework introduced above.

4.3 **Data**

The conceptual framework illustrated in fig. 4-2 identified four types of factors that influence the purchase decision. To collect relevant data on variables relating to those four factors, several data sources needed to be combined. Below we detail for each factor which variables and corresponding data were introduced in the model and summarise these in Annexe Table A 4-1.

Supply

From the supply side, online offer is proxied by the percentage of enterprises selling online at least 1% of turnover from Eurostat. Infrastructure, including the provision of various ICT services, is covered by two variables: internet usage as a percentage of the population from the International Telecommunications Union and the quality of ICT infrastructure from Donaubauer et al (2014).

Personal characteristics

Personal characteristics of respondents are measured with three groups of variables from special Eurobarometer surveys on consumer attitudes towards cross-border trade and consumer protection. The surveys are representative samples of the EU population plus Iceland and Norway covering the years 2006, 2008, 2010, 2011, 2012

and 2014. The first group covers standard variables relating to the individual: log of age, gender, level of education and occupation. The second group covers institutional and interpersonal trust. There are a choice of possible indicators. Institutional trust is linked with the rule of law so that the variable selected covers the ease with which consumer rights can be settled by courts. A possible alternative is the variable “trust public authorities to protect rights as a consumer”. Interpersonal trust for cross-border purchases is covered by the variable “confidence in EU purchases over the internet”. This measures whether the individual is more confident, as confident or less confident when purchasing from an EU supplier compared to a domestic one. A third group of variables indicates the type of location in which the consumer is situated: rural, small town or urban and metropolitan.

Socio-economic environment

Three groups of variables relate to the socio-economic environment of the country where the consumer resides. A number of economic variables from Eurostat measure the size of market, per capita expenditure, the level of prices and income distribution. Size of market and per capita expenditure are macro-economic variables measured by the final consumption of households rather than GDP which relates to the economy as a whole. They are measured – in logs - at current prices and exchange rates in the case of market size and current prices and purchasing power parities in the case of real per capita expenditure. The financial crisis and subsequent eurozone crisis affected EU countries very differently, leading in certain cases to quite substantial drops in both market size and incomes. With inflation extremely low in this period, current prices capture these developments better than constant prices and exchange rates or volume indices of per capita expenditure. Price level indices of actual individual consumption measure the level of prices in each country compared to the EU-28 average. An index above 100 indicates that a country has higher than average prices. Income inequality is measured by the Gini coefficient times 100. All of these variables are time series.

A second group of variables measure culture (Schwartz, 2006). Three Schwartz values express different dimensions of society. Autonomy measures the degree to which individuals pursue their own ideas and intellectual directions independently. It is the opposite of embedded cultures which emphasize maintaining the status quo and

restraining actions that might disrupt in-group solidarity or the traditional order. Important values in the latter cultures are social order, respect for tradition, security, obedience, and wisdom. Egalitarianism seeks to induce people to recognize one another as moral equals who share basic interests as human beings. It is the opposite of hierarchy which relies on hierarchical systems of ascribed roles to insure responsible, productive behaviour. Hierarchy defines the unequal distribution of power, roles, and resources as legitimate. People are socialized to take the hierarchical distribution of roles for granted and to comply with the obligations and rules attached to their roles, so that hierarchy does not promote risk taking.

Mastery encourages active self-assertion in order to master, direct, and change the natural and social environment to attain group or personal goals. Values such as ambition, success, daring, and competence are especially important in mastery cultures. The polar opposite is harmony, which emphasizes fitting into the world as it is, trying to understand and appreciate rather than to change, direct, or to exploit.

Countries that have high levels of fractionalization are observed to perform less well economically (Desmet, Ortuño-Ortín& Wacziarg, 2009, 2012, 2017). Ethnic and religious fractionalization by lowering levels of trust act to depress the willingness to purchase cross-border. However, ethnic fractionalization also means that consumers have cultural references outside their country of residence which can lead them to purchase cross-border from their culture of origin. Linguistic fractionalization if it leads to a greater willingness to learn foreign languages would rather favour cross-border purchasing. Like underlying cultural traits, fractionalization changes only slowly and is measured at only a single point in time.

In terms of governance, rule of law and perceptions of (lack of) corruption from the World Bank governance indices can be associated with institutional and interpersonal trust building respectively. These two indicators are highly correlated and rule of law is preferred although corruption would be equally valid as an indicator.

Regulations

Being able to supply goods and services online requires new working arrangements that privilege flexibility. Countries with rigid labour markets are therefore likely to have more difficulty in adjusting their offer than those with less restrictive employment practices. Equally rigid product markets, particularly for network services, can stifle

entry and lead to higher prices and less innovation for consumers. Labour market and product market regulation indices are retrieved from the OECD labour market and product market regulation data bases respectively.

Descriptive Statistics

Basic statistics on the willingness to purchase cross-border compared to purchasing only domestically are set out in table 4-2. Overall on average 43.6% of a representative sample of EEA consumers were willing to purchase online during the previous twelve months in the years the surveys were taken, 2006, 2008, 2010, 2011, 2012 and 2014. Of those who made an online purchase, 59.5% purchased only from a domestic supplier and 40.5% made a cross-border purchase.

Table 4-2 Descriptive Statistics

Variable	***Observations***	***Mean***	***Std. Dev.***	***Min***	***Max***
Online Purchasers					
All consumers	98811	0.436	0.496	0	1
Only domestic purchasers	43098	0.595	0.491	0	1
Domestic and cross-border purchasers	43098	0.219	0.414	0	1
Only cross-border purchasers	43098	0.186	0.389	0	1
All cross-border purchasers	43098	0.405	0.491	0	1
Purchaser characteristics					
age	43098	42.288	14.936	15	94
gender	43098	0.507	0.500	0	1
occupation	43098	3.012	1.504	1	6
education	43098	3.351	0.822	1	4
EU purchase confidence	43098	1.591	0.579	1	3
consumer rights courts	43098	2.584	0.841	1	4
internet access	43098	0.959	0.199	0	1

Average age of the cross-border buyer was 42 years and just over half were female. Respondents had rather less confidence in suppliers from other EU countries than their domestic suppliers but a fairly high confidence in the ability of domestic courts to settle disputes. Nearly all those who bought online had personal internet access. 30% of

respondents lived in rural settlements, 38% in small towns and 31% in large towns or metropolitan areas.

4.4 Model specification

To test the conceptual framework outlined in section 2 we employ a sequential decision model, of which we do not model the first sequence: to buy online or not, but only model the second whether to buy cross-border or not for those individuals that decided to buy online. To this end we specify a binomial logit model which links the conditional probability to purchase cross-border (alternative 1) versus exclusively domestically (alternative 2) to the set of explanatory variables outlined above.

The binomial logit model , which is consistent with a consumer optimizing utility from comparing the 2 alternatives (McFadden, 1974) , relates the probability of choosing an alternative to the characteristics of the individual following the equation below:

$$Prob(\text{choice} = j\ for\ i) = \frac{e^{F(\beta j, X_i)}}{\Sigma_j e^{F(\beta j, X_i)}}$$ j=1,2 (alternatives) i=1, …n (individuals)

We use a linear function F with arguments X_i=(personal-characteristics, supply, socio-economic-characteristics, regulation, μ), where personal-characteristics represents the vector of variables intrinsically linked to individual *i* at time *t* in country *k* as introduced in the Data section. The other characteristics are country wide variables typifying individual i living in country k at time t. Supply represents the vector of variables relating to the offer of firms online as well as ICT related variables, all of which are time varying by country with the exception of ICT infrastructure, which is measured at a single point in time. Socio-economic-characteristics represents the vector of country specific variables measuring economic size and development, governance, culture and fractionalization. With the exception of culture and fractionalization these variables are time varying. Regulation represents a vector of country level variables on labour and product market regulation.. As the survey was repeated for several years, but not with the same individuals, we pooled the data from the various surveys and allowed for a time varying intercept.

4.5 Results

Logit regressions (1) and (2) in table 4-3 apply the basic specification in the previous section, respectively without and with errors clustered. Given that many unobserved

elements in the error term may be country specific we clustered observations by country and accounted for possible correlations of the error term within clusters in the estimation of the standard errors of the coefficients. As a result, in column (2) standard errors for the individual purchaser variables are on average only one third higher than those without clustering of the standard errors. For the country level variables that do not vary across individuals within countries they are four times as high, as expected (see Cameron and Miller, 2015 on this point). As a result confidence limits are much wider for the country level variables.

In the basic regression with clustered standard errors in column (2) , many of the characteristics of the individual purchaser have a highly significant impact on the logarithm of odds of purchasing cross border compared to that of exclusively purchasing domestically online ($p<0.001$). In order to facilitate interpretation column (3) presents the odds ratio effects for the regression in column (2). The odds ratio effect is to be interpreted as the multiplicative effect of a unit change in regressor X_i on the odds ratio. It is therefore necessary to take into account the units in which X_i are measured as set out in Annexe Table A 4-1.

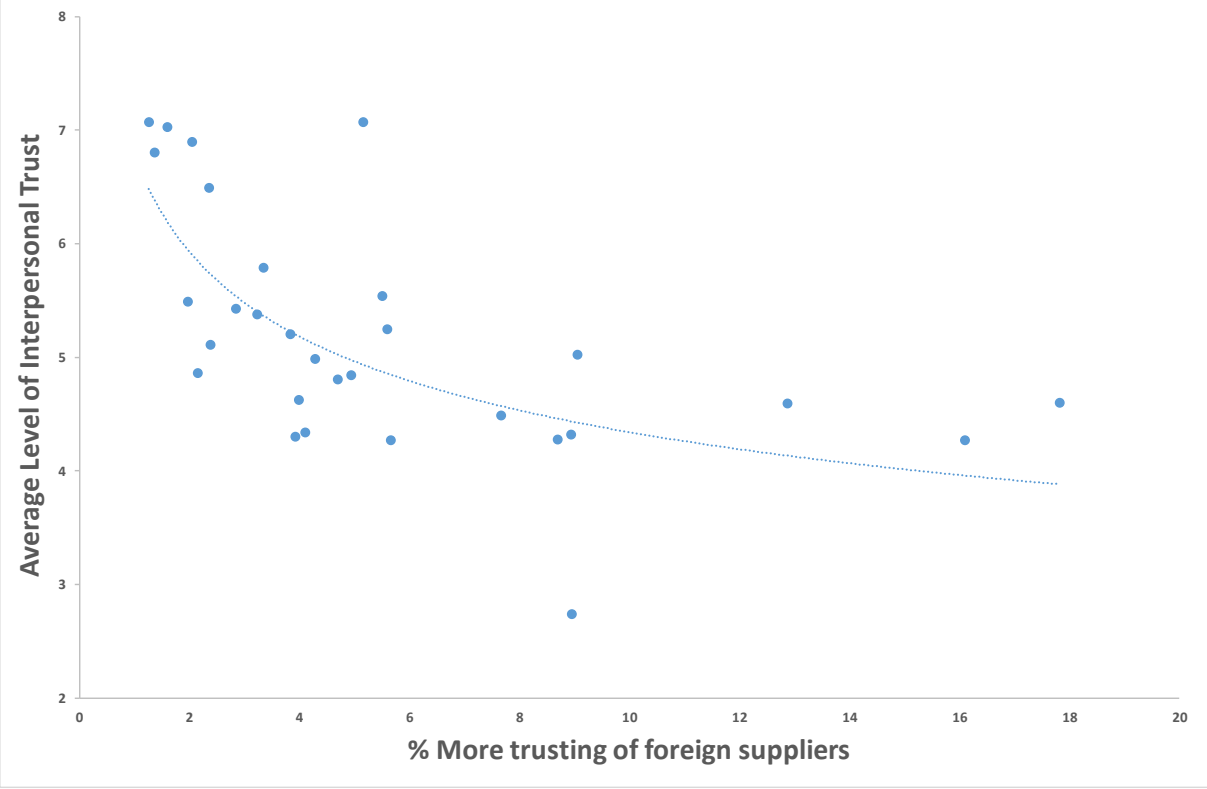
Women and older people are less likely to purchase cross-border while those more highly educated (base is those leaving school before age 15) and those with higher skilled occupations (base is manual workers) are more likely to purchase cross-border. These results follow closely those for willingness to purchase online and are signed as expected.

Purchasers located in a large town or metropolitan area compared to those that live in rural areas are much more likely to purchase cross-border relative to those that purchase only domestically in spite of the advantages of distance selling for those in rural areas. Wider mobile coverage and higher internet speeds favour the urban residents. The literature on global cities also stresses the importance of the links that these cities have with each other over links with smaller agglomerations within the same country leading to a more international orientation for those that live in such cities (Badger, 2017).

The two variables measuring individual trust are both positive and highly significant. The variable on ability to use national courts to settle disputes is linked to respect for

the rule of law and might lead a purchaser to prefer to buy domestically. Instead it appears that individuals who are more trusting in their own institutions are more likely to be trusting of those of others as well. The odds ratio coefficient of 2.86 for the variable EU_purchase_confidence implies that moving from level 1 (more trusting in domestic suppliers) to level 2 (equally trusting in domestic or EU suppliers) or from level 2 to level 3 (more trusting of EU suppliers than domestic ones) increases the odds ratio to purchase cross-border by almost three times. Personal trust in suppliers from other EU countries can be higher than for domestic suppliers in low trust countries as illustrated by fig. 4-3 which plots the average share of respondents in each country that are more trusting in foreign suppliers than their own domestic ones against average levels of interpersonal trust in a country. Highest levels of trust in foreign suppliers are found in countries with low levels of domestic trust and this leads them to favour suppliers from other EU countries over their own domestic suppliers.

Figure 4-3 Interpersonal Trust and Trust in Foreign Suppliers



Among the supply characteristics, a higher share of domestic firms that sell online is associated with a lower probability of purchasing cross-border compared to purely domestic purchases. A one percentage point increase in the share of domestic enterprises selling online depresses the odds ratio for cross border purchases by about

3%. Purchasers in countries that lack a well developed domestic supply of firms able to sell online will likely need to seek the goods and services they require abroad. This negative association parallels the impact of the economic variable measuring the size of market where small markets also offer less variety. Quality of IT infrastructure is measured as a rank ordering with countries with good infrastructure receiving a high rank and low number. Both the quality of IT infrastructure and the percentage of the population using the internet should increase the probability of making an online purchase but it is not evident that they should raise the probability of purchasing cross-border over that of purchasing domestically. The non-significant signs in column (2) for IT infrastructure and percent of the population using the internet can therefore be expected.

Socio-economic variables behave much as expected. In addition to size of market, the effect of per capita expenditure has a strong effect on the odds of purchasing cross-border. The variable is measured in logarithms. The estimated coefficient in column 2 can thus be interpreted as an elasticity, suggesting that the odds ratio would increase by 3.67 percent in response to a one percent change in per capita expenditure. Countries with higher prices increase the odds of purchasing cross-border to take advantage of lower prices abroad. Higher income inequality leads to more cross-border purchasing albeit not significantly so. As previously indicated, market size is expected to be negatively correlated with willingness to purchase cross-border since consumers' needs are more likely to be covered by domestic suppliers in larger markets. Higher per capita expenditure allows a greater amount and greater variety of purchases to be made and so should favour more cross-border purchasing. Income inequality however will concentrate purchasing power in fewer hands and depress the number of those who can afford to make purchases cross-border. Although income inequality should depress the number of potential cross-border purchasers, those that remain are more likely to purchase more expensive goods and services that may only be available abroad.

Both rule of law and ethnic fractionalization lead to higher probabilities of purchasing cross-border and are significant at least at the 5% level. Rule of law measures trust in institutions and can be equated at country level with trust in courts at individual level. The positive coefficient for ethnic fractionalization would seem to indicate that the ties linking the diaspora outweigh the impact on overall levels of trust in deciding whether

to purchase cross-border. Linguistic fractionalization is signed negatively and significant at the 5% level, which is unexpected. Ethnic and linguistic fractionalization are quite highly correlated ($\rho = 0.7564$) so that the likely positive effect of linguistic diversity may already be captured by ethnic diversity. Cultures that encourage risk taking and self-expression also encourage purchasing cross-border as expected.

The two variables capturing regulation perform less well than expected. Higher levels of employment protection regulation lead to a lower probability of purchasing cross-border but the coefficient is not significant. Higher levels of network regulation lead to an unexpected positive, but non-significant coefficient. As with levels of IT, regulation may be affecting negatively the willingness to sell online rather than the probability of purchasing cross-border compared to domestically.

The effect of regulation may also be related to the type of product. Unfortunately, the Eurobarometer surveys on consumer attitudes towards cross-border trade and consumer protection did not ask questions on which products purchasers bought. Data on internet purchases without a breakdown between domestic and cross-border purchases by individuals is available from Eurostat surveys on E commerce. From these data we could estimate the propensity to purchase certain products online by age groups, gender, country and year and link these propensities to the data on individuals provided by the Eurobarometer survey data. Some observations are lost because the age groups for the Eurostat data stop at 74 years of age.

The Eurostat data reveals that young males are far more likely to purchase films and music and computer software online than the rest of the population and young females are far more likely to purchase clothes and sports equipment online. As to the expected product effect, services that do not require more costly cross-border delivery should be more likely to be purchased cross-border. Conversely goods that are perishable and require delivery or those that may need after-sales service should be more likely to be purchased domestically. However, regulations may affect positively or negatively the ease with which goods or services can be purchased cross-border. Services under copyright such as films/music, books and computer software can be subject to geoblocking through allocation of rights on a geographic basis (this appears to be rare for computer software). Geoblocking can still occur as a form of third degree price

discrimination, for example for tickets for events such as Disney, where high income countries are charged more for the service than lower income ones.

After controlling for propensity to purchase goods and services, in the regression presented in column (4) we find, food and groceries and tickets for events depress the probability of purchasing cross-border online while travel and accommodation increase it. Food is one of the categories that would be least expected to purchase cross-border. Certain tickets for events would certainly be purchased cross-border since they are linked to tourism and can be delivered online. The repeat nature of the purchase can mean that it is more frequent to purchase tickets for local events than those further away.

Interesting to note is that the inclusion of the product propensities reduces the coefficient of product regulation to almost zero, suggesting that the product effects are picking up regulatory effects. Equally interesting is the finding that age and gender continue to affect the probability of purchasing cross border negatively and highly significantly in column (4). The age and gender effects cannot therefore be attributed solely to differences in the types of product purchased..

To summarise the results from columns (2), (3) and (4), we find that:

- Certain variables that enhance/inhibit the probability of purchasing online have an even stronger influence on the decision to purchase cross border. Characteristics such as age, gender, income levels, trust in institutions and culture fit into this category;

- Certain variables differentiate purchasing cross-border from purchasing domestically. Size of market, interpersonal trust in suppliers from other countries, ethnic fractionalization and product characteristics fall into this category;

- Certain variables that are important for purchasing online in general seem not to be very important when differentiating between purchasing cross-border and purchasing purely domestically. IT infrastructure and to a certain extent regulation appear to fall into this category.

To further test the quality of the estimated model , we performed a number of additional regressions: in the first one in column (5) we left out country level variables and find the pseudo goodness-of fit measure to drop by more than half (0.084 compared to 0.179). Akaike's information criterion (AIC) provides another measure to assess the performance of the different models (smaller values are preferred). In the final regression in column (6) we replaced the country variables with country fixed effects. The country fixed effects model performs marginally better than the basic model. In terms of the AIC, the model in column(4) with estimated product propensities performs even better, although in the latter case the number of observations is not the same. The fact that the changes in pseudo- R^2 and Akaike's information criterion are small suggests that the country variables included in our model are able to pick up most of the country variation and can be considered a good approximation to the true scale of the country level influence.

Table 4-3 Logit Regressions

	(1) Without clustered standard errors	(2) With clustered standard errors	(3) Odds Ratio of Column (2)	(4) With clustered standard errors	(5) With clustered standard errors	(6) With clustered standard errors
Purchaser characteristics						
gender (female)	-0.3990***	-0.3990***	0.6710***	-0.3529***	-0.3555***	-0.4188***
	(0.0229)	(0.0331)	(0.0222)	(0.0686)	(0.0396)	(0.0318)
log-age	-0.2961***	-0.2961***	0.7437***	-0.2751***	-0.0404	-0.3105***
	(0.0428)	(0.0663)	(0.0493)	(0.0753)	(0.1141)	(0.0627)
still in education	0.4015***	0.4015***	1.4941***	0.4156***	0.3383*	0.5402***
	(0.1008)	(0.1114)	(0.1664)	(0.1149)	(0.1488)	(0.0992)
16-20 age at which stopped education	0.2509***	0.2509***	1.2852***	0.1988**	0.0073	0.2848***
	(0.0622)	(0.0553)	(0.0711)	(0.0627)	(0.1186)	(0.0540)
>20 years age at which stopped education	0.4416***	0.4416***	1.5551***	0.4003***	0.2690	0.5415***
	(0.0615)	(0.0713)	(0.1109)	(0.0700)	(0.1410)	(0.0623)
managers & employees	0.2632***	0.2632***	1.3011***	0.2686***	0.2472*	0.2216***

	(1)	(2)	(3)	(4)	(5)	(6)
	(0.0464)	(0.0629)	(0.0819)	(0.0656)	(0.1023)	(0.0539)
self-employed	0.4780***	0.4780***	1.6128***	0.4860***	0.3626***	0.4559***
	(0.0541)	(0.0740)	(0.1193)	(0.0749)	(0.0929)	(0.0701)
inactive	0.1527**	0.1527	1.1650	0.1539*	0.1421	0.0815
	(0.0568)	(0.0781)	(0.0909)	(0.0781)	(0.1228)	(0.0691)
retired	0.1024	0.1024	1.1078	0.1492*	-0.0044	0.0564
	(0.0586)	(0.0721)	(0.0799)	(0.0754)	(0.0953)	(0.0569)
students	0.0914	0.0914	1.0957	0.0915	0.0936	0.0183
	(0.0947)	(0.1143)	(0.1253)	(0.1164)	(0.1463)	(0.1079)
small town	0.0403	0.0403	1.0412	0.0442	-0.1386	0.0946**
	(0.0278)	(0.0410)	(0.0427)	(0.0382)	(0.0904)	(0.0342)
large town/metropolitan	0.1988***	0.1988***	1.2199***	0.2229***	0.0846	0.2845***
	(0.0292)	(0.0602)	(0.0735)	(0.0598)	(0.1092)	(0.0535)
Internet access	0.1159	0.1159	1.1229	0.1157	0.3052**	0.0997
	(0.0616)	(0.1104)	(0.1239)	(0.1152)	(0.1085)	(0.1145)
EU purchase confidence	1.0472***	1.0472***	2.8498***	1.0701***	1.0636***	1.0293***
	(0.0204)	(0.0271)	(0.0773)	(0.0262)	(0.0470)	(0.0268)
Consumer rights courts	0.0739***	0.0739***	1.0766***	0.0778***	-0.0283	0.0821***
	(0.0139)	(0.0175)	(0.0188)	(0.0183)	(0.0460)	(0.0164)
Supply						
%_enterprises selling online	-0.0315***	-0.0315*	0.9690*	-0.0199		
	(0.0028)	(0.0126)	(0.0122)	(0.0118)		
% using internet	-0.0204***	-0.0204*	0.9798*	-0.0249**		
	(0.0022)	(0.0082)	(0.0080)	(0.0080)		
ICT infrastructure	-0.0001	-0.0001	0.9999	-0.0040		
	(0.0020)	(0.0082)	(0.0082)	(0.0093)		
Socio-Economic Factors						
log market size	-0.5583***	-0.5583***	0.5722***	-0.5767***		
	(0.0194)	(0.0908)	(0.0519)	(0.0845)		
log expenditure per capita	3.0645***	3.0645***	21.4245***	2.6676***		
	(0.1479)	(0.6969)	(14.9297)	(0.6592)		

	(1)	(2)	(3)	(4)	(5)	(6)
price levels	0.0100***	0.0100	1.0100	0.0105		
	(0.0013)	(0.0056)	(0.0056)	(0.0063)		
Gini coefficient	0.0212***	0.0212	1.0214	0.0327*		
	(0.0054)	(0.0186)	(0.0190)	(0.0156)		
Rule of law	0.0242***	0.0242*	1.0245*	0.0215*		
	(0.0025)	(0.0114)	(0.0117)	(0.0096)		
Ethnic fractionalization	2.4130***	2.4130***	11.1679***	2.1754***		
	(0.1945)	(0.5822)	(6.5017)	(0.5491)		
Linguistic fractionalization	-1.6359***	-1.6359**	0.1948**	-1.0818		
	(0.2030)	(0.6311)	(0.1229)	(0.5978)		
Religious fractionalization	0.6275***	0.6275	1.8730	0.3667		
	(0.1314)	(0.3724)	(0.6974)	(0.3708)		
mastery	1.4004***	1.4004*	4.0567*	1.0524		
	(0.1383)	(0.7031)	(2.8524)	(0.7666)		
autonomy	-0.1982*	-0.1982	0.8202	-0.0858		
	(0.0825)	(0.3181)	(0.2609)	(0.2468)		
egalitarianism	0.5763***	0.5763**	1.7794**	0.4631*		
	(0.0627)	(0.2022)	(0.3599)	(0.1814)		
Regulation						
Employment regulation	-0.0244	-0.0244	0.9758	-0.1800		
	(0.0578)	(0.2177)	(0.2124)	(0.2100)		
Product market regulation	0.0745	0.0745	1.0773	-0.0602		
	(0.0430)	(0.2333)	(0.2514)	(0.2235)		
Internet purchases						
food				-0.0281**		
				(0.0097)		
films music				0.0180		
				(0.0094)		
books				-0.0049		
				(0.0091)		

	(1)	(2)	(3)	(4)	(5)	(6)
clothes				0.0099		
				(0.0055)		
software				-0.0028		
				(0.0059)		
computer hardware				-0.0113		
				(0.0090)		
electronics				0.0152		
				(0.0098)		
financial services				-0.0082		
				(0.0095)		
tickets for events				-0.0326**		
				(0.0121)		
travel				0.0210*		
				(0.0083)		
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Country Fixed Effects						YES
constant	-34.8846***	-34.8846***		-28.8740***	-2.4484***	-1.2665***
	(1.7072)	(7.9039)		(8.0404)	(0.3798)	(0.2736)
N	43098	43098	43098	39382	43098	43098
pseudo R-square	0.180	0.180		0.186	0.084	0.195
AIC	47753.2807	47737.2807		43576.6856	53307.2538	46898.2815

Standard errors in parentheses

* p<0.05 ** p<0.01 *** p<0.001

As a further check on the robustness of the results, the sample was divided into two periods corresponding to the pre and post financial crisis periods (Table A 4-2). The coefficients are quite stable across time periods with some variation within groups of variables. For example education becomes less important but occupation more important as factors influencing cross-border purchasing. The impact of economic factors appears to have grown stronger post-crisis as would be expected.

4.6 Discussion and Conclusion

We find the probability of purchasing online cross-border over purchasing online purely domestically to be influenced by both the personal characteristics of the purchaser and the socio-economic environment of the country in which the individual is based. Standard individual socio-demographic characteristics as well as the type of locality in which the individual lives and personal trust all play a significant role in the willingness to purchase cross-border.

The 2017 edition of the EU Consumer Conditions Scoreboard found that consumer trust in e-commerce has dramatically increased. Since the previous 2015 Scoreboard consumers' levels of trust had increased by 12 percentage points for purchases from retailers located in the same country and by 21 percentage points for purchases from other EU Member States. EU policies on consumer protection and data protection have had some success in fostering this positive outcome. Fear of financial fraud has diminished and policies on right of return, small claims procedure and privacy have increased individual confidence in purchasing online albeit with some attendant cost attached.

Our results reveal that the social, economic and political environment plays a very important role for the decision whether to purchase cross-border. Economic variables in terms of size of market, average incomes and income inequality play the primary role but institutional and cultural variables such as rule of law and ethnic fractionalization are important elements of this environment. The strong role for country specific factors points to the possibility for public policy to act that level.

Country level obstacles to cross-border purchasing will need to be addressed if the full potential of the Single Market for consumers is to be realised. Macro-economic convergence if successful should raise incomes and lead to more cross-border purchasing. It needs to be stressed that the Single Market for many services important for internet shopping is not working satisfactorily, for telecommunications and postal services in particular. Recent attempts to address remaining single market obstacles in the form of VAT, delivery costs and geoblocking remain below what would be required. While policies that address trust from the point of view of the individual consumer have had some success in raising the level of trust in internet shopping, those that address trust related institutional factors at country level remain

underdeveloped. Key issues of governance such as the rule of law and levels of corruption need to be more vigorously tackled as does the adequacy of public administration in certain Member States.

By measuring the extent to which personal as well as country-wide socio-economic factors matter and differentiate the decision to purchase cross-border from the decision to buy domestically, this chapter not only contributes to the extant literature , but also provides better guidance to policy makers who want to stimulate cross-border e-commerce. By concentrating exclusively on the cross-border aspect, it also informs policy makers of the most relevant aspects for European integration.

There are, however, country specific conditions that are of another nature and cannot be addressed by policy makers and which also cannot be considered as obstacles to online cross-border purchasing. Consumers in large country markets will always have a wider variety of goods and services to purchase domestically than in the many small markets. Hence, we cannot expect each country to convergence to the same level of cross-border purchasing incidence.

A number of limitations of the chapter should be acknowledged. Some socio-economic variables that would have been preferably measured at the individual level could only be accounted for at country-wide level. This in particular affects the variables on culture. The nature of products purchased online could only be accounted for indirectly and information on the products specifically purchased cross-border was unavailable. Certain important barriers to cross-border purchasing such as additional delivery costs associated with purchasing cross-border could only be controlled for indirectly via the probability of purchasing certain goods and services online. The impact of levying VAT at the rate of the destination country could not be controlled for at all. We hope that with new and improved data forthcoming these shortcomings can be addressed in further research..

Annexe Tables

Table A 4-1 Variables used in the regressions

Indicator	***Source***	***Time***	***Unit of Measurement***
gender	Eurobarometers	Annual	Male=0, female=1
age	Eurobarometers	Annual	Log of age in years
Still in education	Eurobarometers	Annual	Left school before age 15=0 Still in education =1
16-20 age at which stopped education	Eurobarometers	Annual	Left school before age 15=0 Age 16-20 =1
>20 years age at which stopped education	Eurobarometers	Annual	Left school before age 15=0 Age>20 =1
managers & employees	Eurobarometers	Annual	Manual worker=0 managers & employees=1
self-employed	Eurobarometers	Annual	Manual worker=0 self-employed =1
inactive	Eurobarometers	Annual	Manual worker=0 inactive =1
retired	Eurobarometers	Annual	Manual worker=0 retired =1
students	Eurobarometers	Annual	Manual worker=0 students =1
small town	Eurobarometers	Annual	Rural area=0 small town=1
large town/metropolitan	Eurobarometers	Annual	Rural area=0 large town/metropolitan=1
internet_access	Eurobarometers	Annual	No access=0 Access=1
EU_purchase_confidence	Eurobarometers	Annual	More confidence in suppliers from other EU countries=3 Equal confidence between domestic and EU suppliers=2 Less confidence in EU suppliers than domestic suppliers=1
consumer_rights_courts	Eurobarometers	Annual	Index between 1 & 4

Indicator	***Source***	***Time***	***Unit of Measurement***
%_enterprises selling online	Eurostat	Annual	Percentage points of enterprises
Internet usage	International Telecommunications Union	Annual	Percentage points of population
ICT infrastructure	Donaubauer, Meyer, Nunnenkamp, Kiel Working papers No. 1929 | June 2014	2010	Rank
Socio-economic factors			
Final consumption of households current prices euro	Eurostat	Annual	Log of million euro
Real expenditure of households per capita in PPS	Eurostat	Annual	Log of PPS_EU28
Price levels	Eurostat	Annual	Index EU28=100
Gini coefficient	Eurostat	Annual	Index between 0 and 100
Rule of Law	World Bank Worldwide Governance Indicators	Annual	Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.
Ethnic Fractionalization, Linguistic Fractionalization, Religious Fractionalization	Desmet, K., Ortuño-Ortin, I. and Wacziarg, R., "The Political Economy of Ethnolinguistic Cleavages," NBER Working Paper #15360, September 2009.	2000	Composite indices between 0 and 1. Higher values indicate more fractionalization
Mastery, autonomy, egalitarianism	Schwartz A Theory of Cultural Value Orientations Comparative Sociology, Volume 5, issue 2-3	2000	Index based on surveys. A constant (4.0) has been added to each score to bring it back to its approximate location on the original -1 to +7 response scale.
Strictness of employment protection	OECD	2013 or 2014	Composite index with values between 0 and 6
Network Industry Regulation	OECD	2013	Composite index with values between 0 and 6

Indicator	***Source***	***Time***	***Unit of Measurement***
Internet Purchases			
Food, films_music, books, clothes, software, computer_hardware, electronics, financial_services, tickets for events, travel	Eurostat	Annual	Percentage points of individuals who used internet within the last year who purchased the product

Table A 4-2 Pre and Post-Crisis Base Specification Logit Regressions

	(1) Pooled With clustered standard errors	(2) Pre-Crisis With clustered standard errors	(3) Post-Crisis With clustered standard errors
Purchaser characteristics			
gender (female)	-0.3990***	-0.3796***	-0.3912***
	(0.0331)	(0.0750)	(0.0292)
log-age	-0.2961***	0.0599	-0.3618***
	(0.0663)	(0.1290)	(0.0634)
still in education	0.4015***	0.6114**	0.3607**
	(0.1114)	(0.1903)	(0.1262)
16-20 age at which stopped education	0.2509***	0.4253**	0.2145**
	(0.0553)	(0.1433)	(0.0712)
>20 years age at which stopped education	0.4416***	0.6898***	0.3838***
	(0.0713)	(0.1749)	(0.0780)
managers & employees	0.2632***	-0.0083	0.3186***
	(0.0629)	(0.0949)	(0.0681)
self-employed	0.4780***	0.2320	0.5371***
	(0.0740)	(0.1514)	(0.0744)
inactive	0.1527	0.0546	0.1693*
	(0.0781)	(0.1243)	(0.0745)
retired	0.1024	-0.2033	0.1985*
	(0.0721)	(0.1132)	(0.0837)

	(1)	(2)	(3)
students	0.0914	0.0000	0.1175
	(0.1143)	(.)	(0.1215)
small town	0.0403	0.0936	0.0190
	(0.0410)	(0.0648)	(0.0518)
large town/metropolitan	0.1988***	0.2452**	0.1910**
	(0.0602)	(0.0812)	(0.0654)
internet_access	0.1159	-0.1397	0.3626***
	(0.1104)	(0.1490)	(0.1046)
EU_purchase_confidence	1.0472***	0.5810***	1.2289***
	(0.0271)	(0.0502)	(0.0376)
consumer_rights_courts	0.0739***	0.0348	0.0697***
	(0.0175)	(0.0271)	(0.0200)
Supply			
%_enterprises selling			
online	-0.0315*	-0.0484***	-0.0326*
	(0.0126)	(0.0125)	(0.0137)
%_using_internet	-0.0204*	-0.0299***	-0.0218**
	(0.0082)	(0.0046)	(0.0080)
ict_infrastructure	-0.0001	-0.0096	0.0028
	(0.0082)	(0.0075)	(0.0087)
Socio-Economic Factors			
log market size	-0.5583***	-0.4577***	-0.5862***
	(0.0908)	(0.0701)	(0.0944)
log expenditure per capita	3.0645***	2.8325***	3.2874***
	(0.6969)	(0.4836)	(0.6490)
price levels	0.0100	0.0054	0.0118*
	(0.0056)	(0.0063)	(0.0051)
gini	0.0212	0.0219	0.0285
	(0.0186)	(0.0163)	(0.0207)
rule_of_law	0.0242*	0.0261***	0.0284*
	(0.0114)	(0.0060)	(0.0124)
ethnic_fractionalization	2.4130***	-0.8410	3.2695***
	(0.5822)	(0.7190)	(0.6439)
linguistic_fractionalization	-1.6359**	2.0327**	-2.6583***
	(0.6311)	(0.7702)	(0.7716)
religious_fractionalization	0.6275	-1.4728***	1.2061**
	(0.3724)	(0.3547)	(0.3856)
mastery	1.4004*	0.1628	1.1995*

	(1)	(2)	(3)
	(0.7031)	(0.8418)	(0.6058)
autonomy	-0.1982	0.0115	-0.4622
	(0.3181)	(0.2753)	(0.3429)
egalitarianism	0.5763**	0.1370	0.7346***
	(0.2022)	(0.4695)	(0.1985)
Regulation			
employment_regulation	-0.0244	-0.2886*	0.0897
	(0.2177)	(0.1321)	(0.2532)
product_market_regulation	0.0745	-0.4891**	0.1568
	(0.2333)	(0.1777)	(0.2318)
Year Fixed Effects	YES	YES	YES
constant	-34.8846***	-24.4584***	-36.6470***
	(7.9039)	(5.6025)	(7.1000)
N	43098	9687	33411
pseudo R^2	0.180	0.138	0.198
AIC	47737.2807	10974.7742	36455.2469

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

CONCLUSIONS

Missing trade denotes the difference between the trade that is actually observed between countries and the trade that would be expected in the absence of barriers between markets. Efforts to complete the Single Market for Services and to liberalise trade under the WTO aimed to lessen or eliminate territorial barriers to trade and thereby to stimulate trade in services. Observed levels of trade for services remain well below those for goods. The greater complexity of trade in services compared to goods and the attendant difficulty of observing trade in services mean that it has tended to go under-reported by a factor of about two on a value added basis. However even accounting for these differences, with few exceptions services remain less traded internationally than goods. Natural barriers may still stifle trade even in the absence of the obstacles that the Single Market Programme were intended to address. The extent of these natural barriers represents an important issue because the impact of efforts to liberalise markets for services depends on the practical possibilities of supplying a market from abroad.

Chapter 1 used the extent to which services are traded domestically as the yardstick by which the possibilities for international trade are measured. It found that services that are more traded domestically are also more traded cross-border. Services that are little traded domestically, for example because repeated interaction between supplier and client makes it unprofitable to do so, may still be supplied through setting up a local subsidiary in the area. Distribution and administrative services such as office cleaning do indeed conform to this pattern. However other services, especially knowledge intensive business and ICT services are mainly traded through a permanent presence in spite of being heavily traded domestically. Overall missing trade is identified as relating more to the form of trade – with less cross-border than expected – rather than to its amount. The predominance of permanent presence over imports has implications for the degree of competition on domestic markets for services and the overall effectiveness of the SMP in terms of consumer welfare.

Chapter 2 uses Belgian data between 1997 and 2005 to explore in more detail the preference of firms to supply markets for services through permanent presence and thereby the missing cross-border trade in services. It finds that the low level of cross-border trade cannot be attributed to a lack of firms willing to engage in such trade.

Indeed once the size threshold is lowered to cover more or less all firms, many micro firms are observed to engage in trade. Rather than barriers to entry to internationalisation it is barriers to growth that can explain the low level of the share of imports in trade in services. This mirrors a more general observation with regard to a Belgian (and European) "missing middle" of firms in services[10]. Whether or not the imperfections of the Single Market for services leads to less growth for the smaller firms is an important area for future research.

Inherent characteristics of the different services do play a role in the choice between permanent presence and cross-border trade with more physically tangible and easier to comprehend services more likely to be exported and services requiring co-location between supplier and user more likely to be supplied via a permanent presence. Many professional firms are able to supply complex services cross border so that this does not appear as a hindrance to exporting.

Chapter 3 re-examines missing trade for imports of services in greater detail by looking at how their inherent characteristics affect the amount by which a service is traded cross-border using data from eighteen European Member States and forty-three partner countries between 2006 and 2012. Even over the relatively short period covered there have been significant changes in the shares of different services traded cross-border. These changes can be linked to the need to manage far flung production chains with ICT and knowledge intensive business services increasing their shares. Even so, border effects remain substantial. Distance continues to depress imports of services and there is no evidence that the effect is declining over time in spite of the fact that the increasing number of services that can be traded over the internet are essentially distance free. A possible explanation might be the role of physical distance

[10] A comparison of the distribution of Belgian employment with that of the US reveals that with the exception of public utilities the share of the largest firms is always higher in the US (the same is true for turnover and value added). However the distribution for manufacturing and public utilities are quite similar with steadily rising shares of employment by size category. Belgian services however display either declining shares by size category or a u-shape distribution concentrated in micro or large firms while in the US the distribution by size category for services is much closer to that for manufacturing.

acting as a proxy for administrative, cultural, institutional and economic differences, which are being proxied by the distance variable.

Service characteristics do not always have the expected effect on the value of imports of services or act in the same way as for the choice between cross-border trade and permanent presence. Physical tangibility acts to depress trade in services rather than to facilitate it. The rising share of computer and information services which can be stored and transported in digital form as intangible goods would be compatible with this finding. Services that are more heavily traded are more rather than less likely to be high in experience although the results are not significant. Most services are very high in experience and this variable may not be very discriminating.

Services which are simple to understand act to increase trade in services as expected but complexity only depresses trade at the beginning of the period. Equally, services that require simultaneous physical presence of both supplier and user does depress trade in services but the size and significance of the coefficients declines over sharply the period. There is evidence that the negative impact of certain service characteristics on cross-border trade is no longer as strong in the past. The long-heralded impact of ICT on trade in services seems at last to receive some support in the data. Should this be confirmed it implies that the potential for increased trade in services cross-border is greater than was previously believed.

While service characteristics are important as an explanation for the source of missing trade, the administrative, cultural, institutional and economic differences identified in the previous chapter as possible alternative explanations needed to be investigated further. Chapter 4 provides the possibility of doing so along with a novel measure of trade in the form of the probability of purchasing online cross-border compared with that of purchasing online exclusively domestically. Most of the data on services is collected from the supply side but crucial decisions on purchasing come from the demand side. It is relatively difficult to observe these decisions directly particularly when identifying cross-border purchases separately from domestic ones. For one particular sector, e-commerce , data on the EU level are available.

The probability of purchasing online cross-border over purchasing online purely domestically was found to be influenced by both the personal characteristics of the purchaser and the socio-economic environment of the country in which the individual

is based. Standard individual socio-demographic characteristics as well as the type of locality in which the individual lives and personal trust all play a significant role in the willingness to purchase cross-border. While high levels of personal trust tend to favour both the willingness to purchase online both domestically and cross-border, low levels of trust in domestic suppliers can actually boost the willingness to purchase cross-border when foreign suppliers appear more trustworthy than domestic ones.

The results from chapter 4 reveal that the social, economic and political environment plays a very important role for the decision whether to purchase cross-border. Economic variables in terms of size of market, average incomes and income inequality play the primary role but institutional and cultural variables such as rule of law and ethnic fractionalization are important elements of this environment. Some of these factors such as the size of the domestic market will remain as a structural factor influencing the willingness to purchase cross-border. This should not be seen as a weakness. Small countries with limited domestic competition are those that have most to gain from the wider choice and lower prices offered by an integrated market. Differing levels of income may evolve over time providing that efforts to promote economic cohesion are successful. Institutional and cultural variables are less susceptible to evolve over time. Some convergence in taste is to be expected but Europe does not aspire to cultural uniformity and instead tries to draw benefit from diversity in terms of variety of products on offer.

This examination of missing trade for services provides cautious grounds for optimism that some of the previous obstacles to trade that stem from the inherent characteristics of services are becoming less important and the potential for more trade thereby enhanced. Country specific obstacles to greater trade continue to dampen trade and are not always addressable through action by public authorities. The continuing predominance of permanent presence over cross-border trade as the method of choice for firms wishing to internationalise even where the service is traded domestically should give pause for thought. Removing remaining barriers to cross-border trade in services could provide opportunities for the many small firms that already exporting to grow and profit more fully from the opportunities opened up by efforts to liberalise the European markets for services.

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