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Services trade within Canada and the European Union

What do they have in common?

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Abstract in English

This paper explains bilateral services trade using a gravity equation and compares the results with trade in goods. We analyse bilateral trade between the provinces of Canada and between the member states of the European Union. We conclude that the gravity equation explains the variability in services trade very well: market size of the exporting and importing regions and distance are the most important explanatory variables. On average, distance is a less hindrance for services trade than for goods trade. Differences in languages and the regulation of product markets hamper services and goods trade in Europe significantly. Trade in services is also hampered by regulation in the importing country, but this is not true for goods. Services trade within Canada is twice as high as within Europe measured as share of GDP. Tentative estimates suggest that intra-EU services trade could be much higher if the internal market would function like the Canadian services market.

Key words: trade in services, gravity equations, internal market EU, regulation

Abstract in Dutch

In dit onderzoek wordt de handel in diensten verklaard met een graviteitsvergelijking. De resultaten worden vergeleken met de handel in goederen. We analyseren bilaterale handel tussen de provincies in Canada en tussen de lidstaten van de Europese Unie. We concluderen dat de graviteitsvergelijking de omvang van de dienstenhandel goed verklaart. De marktomvang van de exporterende and importerende regio's en hun onderlinge afstand zijn belangrijke verklarende variabelen. Gemiddeld genomen is afstand een minder grote belemmering voor de handel in diensten dan voor goederen. Taalverschillen en regulering van de exporterende regio hinderen de handel in goederen en diensten in de EU. De handel in diensten wordt ook beperkt door regulering in de importerende regio. Dat geldt niet voor goederen. Dienstenhandel in Canada is twee keer zo groot als in de EU gemeten als aandeel van het BBP. Een tentatieve analyse suggereert dat de intra-EU dienstenhandel significant kan toenemen als de interne markt zou functioneren als de Canadese dienstenmarkt.

Steekwoorden: handel in diensten, graviteitsvergelijking, interne markt EU, regulering

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Summary

Trade in services is much less developed than trade in goods. Services trade represents barely 7% of service production, and it forms only 20% of total trade. This is low because the share of services in GDP is about seventy per cent in developed economies.

There are several explanations for the low level of services trade. The first is the nature of services. The use of a service often needs the proximity of the supplier and consumer. This restricts cross-border trade and induces the service supplier or consumer to travel in order to establish an international service transaction.

The second is that many governments regulate domestic services markets to deal with market failures like quality uncertainty. They demand quality requirements for the services products and/or suppliers and impose quantitative restrictions. These regulations hamper trade because suppliers not only have to deal with the requirements in their own country, but also in the destination country of their exports or investments. Often, the requirements between the countries differ, such that service providers have to qualify for each export market.

This paper is one of the first efforts to explain the bilateral patterns in services trade. Trade in goods can be well explained by the so-called gravity equations. This type of research has shown that bilateral trade in goods is to a large extent explained by the size of the markets in the origin and destination country (often indicated by GDP), the geographical distance between the countries, cultural differences, common membership of a free trade area, and the level of economic institutions. Here, we ask the question whether trade in services can also be explained by these variables.

We exploit two data sets on cross-border trade in services. The first is a data set on bilateral trade in services between the provinces in Canada for 1997 to 1999. The advantage of this data set is that we are able to analyse trade within one country, such that all kind of explanatory variables in gravity equations that focus on differences in economic institutions and regulations, play no (or only a minor) role. We can concentrate on variables like market size and distance, and compare the results with trade in goods. An other characteristic of the data set is the classification of services trade in about ten sub-sectors. So, we are able to analyse bilateral services trade at a disaggregated level.

We conclude that the volume of services trade is determined by the market size of the origin country to a larger extent than by that of the destination country, even though this is not the case for the sub-sector Hotels & Restaurants. Moreover, the distance between provinces in Canada is as important for goods trade as it is for services trade. For services as Communication, Finance, and Private education, distance is less relevant for trade. Distance is a more important trade barrier for the sectors Wholesale margins and Transport.

The second data set is on bilateral services trade between OECD countries between 1999 and 2001. We focus on trade between the EU member states because trade in services should be further developed within the EU than between other OECD countries as a result of the internal market in the EU. In this analysis, differences in culture, institutions and regulation play a much more important role than for the analysis of inter-provincial trade in Canada. We expect that trade in services is much more hampered by regulation than for Canada, as explained above. Also, here we compare the results with trade in goods. This comparison makes it possible to conclude whether trade in services is more hampered by differences in national regulation than trade in goods.

The results differ somewhat from those on services trade within Canada. For Europe, the market size of the destination country seems to be more important for services trade than that of the origin country. For goods, it is the other way around as it is for Other commercial services, but the market size effect of the origin country is less pronounced than it is for the Canadian data. Moreover, distance seems to be less important for trade in services than for trade in goods in Europe. The level of product market regulation in the origin country hampers trade in goods and services. Product market regulation in the destination country is only a hindrance for trade in services. The reason is that the provision of services is much more affected by regulation than the provision of goods.

Recently, the EC has concluded that the internal market in services is hampered by many regulatory and legal barriers. It is difficult for producers to provide services to consumers abroad whether by cross-border trade or setting up establishments abroad. These barriers consist of legal and non-legal barriers. As a consequence, actual services trade is much lower than its potential. The EC itself tries to stimulate this by proposing a directive to promote trade in services. Here, we exploit the two data sets in order to say something on the potential of the internal market for services within the EU. If we consider Canada as a benchmark situation of an integrated services market, what are the opportunities for Europe of such an integrated market? We compare the European and Canadian data. Based on an analysis with the gravity equation, we conclude what the trade potential for the EU could be if the EU internal market would have the same characteristics as the Canadian market for inter-provincial services trade. We conclude that there is much scope of extra services trade within Europe: intra-services trade could increase by a factor 3 to 5. This potential has to be interpreted as an upper bound. Persistent differences in language and culture and in regulation will make it difficult to exploit the potential trade increase fully.

1 Introduction[1]

Trade in services is much less developed than trade in goods, but this is also true for the economic analysis of services trade. This is not surprising because services trade data are scarce while those on goods are readily available. Only in recent years, some statistics on services trade show up. There is an urgent need for these data, because trade in services is an actual topic in the WTO negotiations on trade liberalisation and within the European Union (EU) in order to improve the functioning of the internal market in services.

This paper is one of the first efforts to explain the bilateral patterns in services trade.[2] Trade in goods can be well explained by gravity equations.[3] This research shows that bilateral trade in goods is explained to a large extent by the size of the markets in the origin and destination country (often indicated by GDP), the distance between the countries, cultural differences, the existence of a free trade area, the level of economic institutions, and some other variables. Here, we pose the question whether this is also true for trade in services.

We know that trade in services is different than trade in goods. The statistics show that services trade is still only 20% of total trade. That is much lower than the share of services in value added in Europe (about 70%). Moreover, services trade represents barely 7% of service production.[4]

The relatively low level of services trade (compared to value added and production) is caused by several factors. The first is the nature of services. The use of a service often needs the proximity of the supplier and consumer. This restricts cross-border trade and induces the service supplier or consumer to travel in order to establish an international service transaction.

The second is that many governments regulate domestic service markets to deal with market failures like quality uncertainty. They demand quality requirements for the service products and/or suppliers and impose quantitative restrictions. These regulations hamper trade because suppliers not only have to deal with the requirements in their own country, but also in the destination country of their exports or investments. Often the requirements between the countries differ, such that service providers have to qualify for each export market.

We exploit two data sets on cross-border trade in services. The first is a data set on bilateral trade in services between the Canadian provinces for 1997 to 1999.[5] The advantage of this data

[1] The authors thank Theo van de Klundert and Henk Kox for their constructive comments.

[2] Other papers are Grünfeld and Moxnes, 2003, Kimura and Lee, 2004 and Mirza and Nicoletti, 2003.

[3] See Anderson and Van Wincoop, 2004 for a recent overview of the gravity model, its theoretical derivation, and its applications.

[4] See Kox and Lejour, 2004. We concentrate here on cross-border trade in services, and neglect the establishment of foreign affiliates. The data show that this form of international service transactions is more important than cross-border trade.

[5] We choose here for Canada because it is one of the few countries with data on inter-provincial trade in services.

set is that we are able to analyse trade within one country, such that all kind of explanatory variables in gravity equations that focus on differences in economic institutions and regulations, play no (or only a minor) role. We can concentrate on variables like market size and distance, and compare the results with trade in goods. The second advantage is that the data set includes trade in about ten sub-sectors in services. So, we are able to analyse bilateral services trade at a disaggregated sector level.

We conclude that the volume of services trade is to a larger extent determined by the market size of the origin province than by that of the destination province, although this is not the case for the sub-sector Hotels & Restaurants. Moreover, the distance between provinces in Canada is as important for goods trade as it is for services trade. For services as Communication, Finance and Private education, distance is less relevant for trade. Distance is a more important trade barrier for the sectors Wholesale margins, and Transport.

The second data set is on bilateral services trade between OECD countries between 1999 and 2001. We focus on trade between the EU member states because trade in services should be further developed within the EU than between other OECD countries due to the internal market in the EU. In this analysis, differences in culture, institutions, and regulation play a much more important role than for the analysis of inter-provincial trade in Canada. Also, here we compare the results with trade in goods. This comparison makes it possible to conclude whether trade in services is more hampered by differences in national regulation than trade in goods.

The results differ somewhat from those on the Canadian data. For Europe, the market size of the destination country seems to be more important for services trade than the origin country. For goods, it is the other way around, as it is for more commercial services, but the market size effect of the origin country is less pronounced than it is for the Canadian data. Moreover, distance seems to be less important for trade in services than for trade in goods in Europe. The level of product-market regulation in the origin country hampers trade in goods and services, but product market regulation in the destination country only hampers trade in services.

Recently, the EC has concluded that the internal market in services is hampered by many regulatory and legal barriers (EC, 2002). It is difficult for producers to provide services to consumers abroad whether by cross-border trade or setting up establishments abroad. These barriers consist of legal and non-legal barriers. As a consequence, actual services trade is much lower than its potential. More trade could stimulate competition, and more competition could lead to lower prices for services and to increasing innovation and productivity in most service markets.

The EC itself tries to stimulate this by proposing a directive to promote trade in services (EC 2004).[6] Here we exploit the two data sets in order to say something on the potential of the

[6] Kox et al., 2004 conclude that cross-border trade in commercial services could increase by 15% to 30%. FDI stocks in services can increase by 20% to 35%.

internal market for services within the EU. If we consider Canada as a benchmark situation of an integrated services market, what are the opportunities for Europe of such an integrated market? We compare the European and Canadian data. Based on an analysis with the gravity equation, we conclude what the trade potential for the EU could be, if the EU internal market would have the same characteristics as the Canadian market for inter-provincial services trade. We conclude that there is much scope of extra services trade within Europe: intra-services trade could increase by a factor 3 to 5. This potential ignores the persistent differences in languages and cultures and in regulation between the EU member states. From this perspective the potential has to be interpreted as an upper bound which will not be fully realised.

The rest of the paper is organised as follows. Section 2 describes the data. Section 3 presents the analysis based on the gravity equations for Canada and the EU. Section 4 compares the results for both entities, and Section 5 concludes.

2 Analysis of the data

This section describes the data on bilateral trade in services for the EU15[7] and Canada. Data on services trade are hard to come by. It is difficult to measure the trade flows because services are often not observable if they cross the border. The information is collected by means of complex systems combining enterprises' direct declarations, surveys, the census of bank transactions and estimates.[8] According to Eurostat (1996) this leads to several types of problems which are not discussed here.[9] For the analysis, however, it is essential to solve the problem of consistency of the EU data. A large part of this section is devoted to that issue.

Data on intra-EU services trade

The bilateral services trade data for the European Union originates from the OECD (2003). The data set covers 22 OECD-countries and 55 partner countries for 1999 until 2001. Except for total services, we also have data for the sub sectors: Other commercial services, Travel, Transport services, and Government services. These four categories add up to total services trade. The database is compiled from trade statistics from several countries and from Eurostat. There are only 9 EU countries that report bilateral services trade. For the other countries, the statistics of their reporting partners are used.[10]

In general, the importing and exporting country do not report the same value for a bilateral trade flow. This is also the case for goods, but in services the differences in reporting seem to be larger. One of the extreme examples is that Finland reports exports of 125 million US$ to France, while France reports imports of 220 million US$ from Finland. This incompatibility of reported values leads to the question whether certain countries do systematically under- or over report imports or exports.

We assess this issue by running a regression with reported imports of country *i* to country *j*, imp_{ij} as the dependent variable and reported exports between these countries, $exp_{ij,}$ and dummies for reporting exporting countries, D^O , or reporting importing countries, D^D , as independent variables.

$$\ln(imp_{ij}) = \alpha + \beta \ln(\exp_{ij}) + \sum_r \gamma_r D_r^O + \sum_r \delta_r D_r^D + \varepsilon_{ij} \qquad (2.1)$$

[7] We only have bilateral services trade data for the15 countries of the European Union that were member before May 2004. The trade data of Belgium and Luxembourg are combined in one entity.

[8] Appendix 1 gives an overview of the methods applied by Canadian Statistics to record service flows between the provinces.

[9] These problems are divided into three categories: difficulties related to recording and valuation, the analysis of values instead of volumes and consistency and symmetry.

[10] The 9 reporting sources are the Oesterreichische Nationalbank, Banque Nationale de Belgique, Bank of Finland, Banque de France, Deutsche Bundesbank, de Nederlandsche Bank, United Kingdom Office for National Statistics, Banca d'Italia, Banco de Portugal and Eurostat New Cronos Database. So we miss bilateral trade statistics between Denmark, Greece, Ireland, Spain and Sweden.

α is a constant term, and β the coefficient for the log of exports. In the ideal case – if both countries report the same value - this coefficient is 1, and that of the constant term, α is 0. The $\gamma's$ and $\delta's$ are the coefficients for the dummies of the reporting exporting and importing countries, respectively. If these coefficients are not statistically significant, country *r* does not systematically under or over reports. If it is positive for the exporting countries, the value of reported exports is lower than that for reported imports. The reporting exporting country thus underreports. If the coefficient is statistically negative for the exporting country, that country thus over reports. If the coefficient is positive for the importing country, that country thus over reports.

The dummy variable for imports for Belgium-Luxembourg and the dummy variable for exports for the Netherlands were left out of the regression for statistical reasons.[11]

Table 2.1 Reporting trade data by importing or exporting country

Exports from	UK	Austria	Belgium	Finland	France	Germany	Italy	Portugal
Coefficient, γ	0.52***	– 0.70***	– 0.08	– 0.39***	0.21**	0.43***	– 0.08	– 0.48***
Standard error	0.09	0.09	0.08	0.14	0.08	0.09	0.08	0.11
Ranking number for reliability	12	16	3	8	6	9	4	11
Imports to	UK	Austria	Finland	France	Germany	Netherlands	Italy	Portugal
Coefficient, δ	0.04	0.57***	– 0.62***	0.02	0.57***	0.16*	0.34***	– 0.47***
Standard error	0.09	0.010	0.12	0.08	0.09	0.08	0.08	0.13
Ranking number for reliability	2	13	15	1	14	5	7	10

Dependent variable is the log of bilateral imports.
The coefficient for the constant term α is 1.83*** (standard error is 0.33).
The coefficient for the log of bilateral exports is 0.74*** (standard error is 0.04).
R^2 = 0.97. ***, **, * denote statistical significant at the 1%, 5%, and 10% level respectively.
Ranking is based on the absolute value of the coefficients. The larger the value, the lower the ranking. This is indicated by a higher ranking number.
Source: OECD (2003a).

From table 2.1, we can conclude that some countries significantly under or over report. Exports are significantly underestimated for the UK, France and Germany. Imports are underestimated by Finland and Portugal. Austria, Finland, and Portugal overestimate their exports, whereas Austria, Germany, the Netherlands, and Italy overestimate their imports.

In order to deal with the differences between reported values between the importing and exporting country, we have made a ranking based on the values of the dummy coefficients in table 2.1. The place each reporting country takes in this ranking is shown in row 4 and 8. Being a benchmark, imports for Belgium-Luxembourg and exports for the Netherlands, share a first place in the ranking for reliability (not mentioned in table).

[11] The combination of the constant terms and the dummies forced us to leave out these two dummies in order to guarantee the independency of the explanatory variables.

When the importing and exporting country both report the bilateral trade flow, we use the data from the country highest placed in the ranking. That country reports on average most reliable. For exports from the Netherlands to Belgium-Luxembourg, the average of the two reported flows was taken. The ranking is also applied to solve reporting inconsistencies of the bilateral trade data for the 4 sub sectors in services trade.

Data Canadian inter-provincial services trade

The Input-Output Division of the Canadian official statistical agency, Statistics Canada, provides the unique data on inter-provincial trade, including that on services. The data set covers the years 1997-1999 and includes ten provinces and two territories. We exclude the two territories (Yukon and Northwest Territories) from our analysis because of a lack of data (or a lack of activity). The data on services trade are subdivided in twenty-four service sub-sectors. For eleven of these sub-sectors, sufficient data are available to include them in the analysis. The data are consistent with the national accounting framework of Canada.

In many cases, proxies are used for inter-provincial trade as data are often not available for the above-mentioned sub-sectors. These proxies are often derived from other data. The construction of the data is described in the appendix.

The data on GDP per province also originates from a Statistics Canada database, namely the CANSIM-II database. We have deflated the data for the years 1998 and 1999 by using the GDP deflators of the World Bank (2003) thereby taking 1997 as the base year.

Table 2.2 Services demand and services trade in Canada, 1999, billions of Canadian dollars

	Transport & storage	Communi-cation services	Wholesale margins	Retail margins	Financial services	Business services	Private education	Health & social services
Inter-provincial trade	10	6	19	3	17	12	0	0
Imports	8	3	1	-	13	13	1	1
National demand	78	39	79	73	182	113	10	37

	Hotels & restaurant	Other services	Transport margins	Rest services	Total services	Total goods	Total
Inter-provincial trade	3	6	7	1	84	107	192
Imports	8	5	-	0	51	337	388
National demand	45	76	23	377	1131	1137	2268

Source: Canadian Statistics. All numbers are in billions of current Canadian dollars.
Total services are the aggregate of the eleven sub sectors (from Transport & Storage to Transport Margins) and Rest services.
Total is the aggregate of total services and total goods.

Table 2.2 shows that inter-provincial services trade is relatively important compared to (international) service imports. Inter-provincial services trade comprises of 84 billion Canadian

dollars and imports 51 billion dollar. For goods, it is the other way around: imports from abroad are three times as large as inter-provincial trade. In terms of total demand (that is final consumption and intermediate demand), more or less the same share of goods and services is provided by inter-provincial trade.

The important sectors in Canadian services trade are Transport and storage, Wholesale margins, Financial services, and Business services.[12] These sectors are responsible for about two-thirds of the inter-provincial trade flows in services. The sector Rest services consists mainly of government services, construction, and dwellings.

The measurement of distances

The measurement of the variable 'distance' is most heavily discussed in the empirical work on gravity equations. According to the gravity equations, actual trade between two regions with a border is relatively low. The explanatory variables of the gravity equation, which are explained in the succeeding sections, predict larger trade flows than the actual flows are. The difference in predicted and actual flows is called the 'border' effect. The size of the border effect is related to the measurement of distances within the own region. Therefore, several distance measurement methods have been proposed, criticised and replaced.[13] The 'empirical puzzle' of the border effect, as it is often referred to according to Head and Mayer (2002), can simply be diminished - although not solved - by using the right distance measurement method. They argue that 'illusory border effects' are created by the standard methods for measuring distance between regions and within regions.

For distances between region *h* and *b*, Head and Mayer (2002) propose the following formula:

$$dis_{hb} = \left(\sum_{k \in h} \frac{y_k}{y_h} \sum_{l \in b} \frac{y_l}{y_b} dis_{kl}^{\theta} \right)^{1/\theta} \qquad (2.2)$$

which they call "effective distance". Equation (2.2) shows that the effective distance is a weighted average of the distances between sub regions of region *h* (denoted by *k*) and region *b* (denoted by *l*). The *y* variables represent the total income (or GDP) of each region; *dis* represents distance between regions *h* and *b*. The parameter θ measures the sensitivity of trade flows to bilateral distances. This formula reduces to average distance formula used by Helliwell and Verdier (2001) for $\theta = 1$. Another common value for θ is -1 because this corresponds to the usual coefficient estimated to gravity equations.

[12] Notice that the tourism sector is not mentioned. The reason is that tourism is not a production category/sector, and production categories are the prevalent sectors in the input output tables. Large expenditures for tourism are reflected by higher demand for production categories like Transport, and Hotels & restaurants.

[13] See among others Wei 1996, Wolf 1997, Nitsch 2000 and Head and Mayer 2000.

For the distances between Canadian provinces, data were provided by Helliwell according to his method ($\theta = 1$). Distances are measured in miles (=1.609 km). For distances within the EU15 we use the database from CEPII (Gaulier et al. (2003)). These distances are measured in km. This database provides distance data that are constructed according to various methods. One of those measures is the formula in equation (2.2) with $\theta = 1$. We use this measure such that the EU and Canadian distance data are constructed in the same way.

3 The gravity model and bilateral trade in services

This section presents the empirical results of our analysis of services trade within Canada and the European Union. First, we present the gravity model. Thereafter, we analyse inter-provincial services trade in Canada, and intra-EU services trade using that model.

The gravity model

The model used for our research is the basic gravity equation as developed by Tinbergen (1962).[14] One can distinguish between the 'basic variables' of the gravity equation and the 'additional variables'. The former refer to the distance and importer's demand and exporter's supply variables. These are most relevant for the analysis of the Canadian data. The latter refer to any other variables that are added to the basic gravity equation. Examples are cultural differences, adjacency of countries, the level of economic institutions, regulatory quality etc. Some of these variables are important if we analyse European services trade. The model reads

$$\ln(\exp_{hb}) = \alpha_0 + \alpha_1 \ln(GDP_h) + \alpha_2 \ln(GDP_b) + \alpha_3 \ln(dis_{hb}) + \beta' Z + \varepsilon_{hb} \qquad (3.1)$$

exp represents the bilateral exports between region[15] *h* and *b*. These exports are explained by the basic variables GDP in the exporting region *h*, GDP in the importing region *b*, and the distance (*dis*) between those regions. *Z* is a matrix that contains other explanatory variables. These explanatory variables depend on the type of regression, and the data set we exploit. In case of the Canada data, we use differences in language between both regions, and the adjacency of regions as explanatory variables.[16] These variables are also used in the other regressions. For the analysis of the EU data, we also include the level of product market regulation of both countries in the regression. In the analysis of the combined data sets, we include a dummy for EU countries, and population density for both the countries of origin and destination.[17]

Inter-provincial trade in Canada

Table 3.1 presents the estimation results for bilateral trade between the Canadian provinces for total services, total goods and goods and services. In all cases, the estimated coefficients are statistically significant and have the expected sign. The coefficient for GDP of the exporting country is slightly higher than 1, and the coefficient for GDP of the destination country is slightly lower than 1. So, for services trade we also derive the traditional result in gravity

[14] Recent overviews of the history of gravity model, its theoretical foundations and applications for trade are given by Anderson and Van Wincoop, 2004 and Nahuis, 2004.

[15] Using the data of Canada the regions are provinces. Using the OECD data the regions are EU countries or EU member states. Region *h* is the exporting or origin region. Region *b* is the importing or destination region.

[16] We call two regions (=Canadian provinces or EU countries) adjacent if they have a common border.

[17] In the regressions we also use year dummies for correct for systematic differences of the year data. In most cases the coefficients of these dummies are not statistically significant.

analyses that the home market effect dominates the foreign market effect. This result implies that the size of the home market (measured by GDP) has a bigger impact on the bilateral trade flow than the size of the foreign market (or destination country).

The estimated coefficient are slightly lower than those of Helliwell (1996), and Helliwell and Verdier (2001). However, these authors also include goods trade between Canadian provinces and US states in their analysis. In these papers, the coefficient for distance is also higher in absolute value (1.4).

An interesting result is that the coefficients for distance for goods trade and for services trade are similar (statistically not different). It is often thought that distance is more important for services trade than for goods trade because services need the proximity of producers and consumers. This point of view suggests a higher coefficient (in absolute value) for services trade than for goods trade. Our empirical result does not imply that proximity is not important. The relevance of proximity could hamper trade or lead to the establishment of foreign affiliates as substitute for trade. It only implies that distance is as a decisive factor for services trade as it is for goods trade if services are actually traded. Even if distance is more important for some services than it is for goods, it could be compensated by services (for example Communication or Financial services) for which distance is a less decisive factor in trade than it is for goods. We consider this issue below if we analyse the inter-provincial trade patterns for the various sub-sectors in services.

Table 3.1 Inter-provincial goods and services trade in Canada 1997-1999

Dependent variable: exports of	Services	Services	Goods	Goods and services
GDP origin	1.191***	1.138***	1.092***	1.130***
	(0.024)	(0.025)	(0.027)	(0.022)
GDP destination	0.908***	0.854***	0.845***	0.874***
	(0.024)	(0.025)	(0.027)	(0.022)
Distance	– 1.275***	– 1.226***	– 1.278***	– 1.257***
	(0.044)	(0.047)	(0.050)	(0.040)
Adjacency dummy	– 0.356***	– 0.370***	– 0.049	– 0.165*
	(0.097)	(0.106)	(0.111)	(0.088)
Language dummy	– 1.688***		– 0.368	– 0.947***
	(0.228)		(0.260)	(0.208)
Constant	– 8.151***	– 7.478***	– 6.242***	– 6.440***
	(0.402)	(0.430)	(0.460)	(0.368)
Adjusted R^2	0.940	0.928	0.922	0.949

***,**,* denote statistical significance at the 1%, 5%, and 10% level, respectively.
Data source: Canadian Statistics (2003) and Helliwell.
Number of observations is 270.
We have also included year dummies, but these coefficients are not statistically significant.

The language dummy (only relevant for Quebec) is significant for services trade and has the expected sign (the dummy is zero if regions share the same language and 0.2 otherwise).

Because it is only applicable for Quebec, the dummy also includes other unobservable characteristics from which Quebec differs from the other provinces. If this variable is introduced in the equation, the coefficients for GDP and distance are slightly lower. The language dummy is not significant for goods trade. This could imply that communication between the provider and consumer is more important for services trade than for goods trade. A reason could be that many traded services are often less standardised than goods. Then it is necessary to communicate more often.

Adjacency is important for services trade but not for goods trade. Interestingly, the coefficient is negative. This suggests that neighbouring provinces trade significantly less than you might expect on basis of distance and market size. Most empirical results for goods trade suggest that neighbouring countries trade relatively more instead of less.

We have also estimated inter-provincial trade for the following sub-sectors: Transportation & storage, Communication services, Wholesale margins, Retailing margins, Financial services, Business services, Private education, Health & social services, Hotels & restaurants (accommodation services and meals), Other services and Transportation margins. Table 3.2 presents the results. Note that for Private education services and Health & social services less trade flows are recorded than for most other sectors. The coefficients of these sectors are statistically significant, but relatively low compared to aggregated services (see table 3.1). Moreover, the explanatory power of the gravity equation is relatively low. Inter-provincial trade in these sectors seems thus to be motivated to a larger extent by other considerations. To some extent that is also the case for Retailing Margins.

The distance coefficient is relatively large for trade in Business services, and Retailing margins compared to total services trade. For Wholesale margins, and Transportation margins it is similar to total services trade (table 3.1). Distance or transportation costs are less relevant in Communication services, Financial services, and Private education services. This is not surprising, in particular not given the technological developments of the last decades. Transportations costs are low for these types of transactions.

The home market effect is relatively large for Wholesale margins, Retailing margins, Business services, Health and social services and other services. It is low in Hotels & restaurants, and Communication services. For the former sector, the foreign market effects even dominate. This is not surprising because expenditures on tourism and business travel are often determined by the purchasing power possibilities of the travellers which come by definition from the destination provinces.

The negative coefficient for adjacency in total services is caused by Financial services. These services are also for about 20% responsible for total inter-provincial trade in services. Due to the technological developments, it seems reasonable that adjacency does not create extra trade in this sector. For the other sub-sectors, it is not significant but it has also a negative sign

in general. An exception is Retailing margins. There, the coefficient is positive and significant, but inter-provincial trade is very meagre in that sector.

The language dummy is negative and significant for all sub-sectors (except health services), although its size differs a lot. These differences only suggest that the role of unobserved heterogeneity of Quebec with the other provinces varies per sub-sector. This is not a very satisfying reasoning, but it is as far as we can get by now.

Table 3.2 Canadian inter-provincial trade in services: sub-sectors, 1997-1999

Dependent variable: exports	GDP origin	GDP destination	Distance	Adjacency dummy	Language dummy	Constant term	Adjusted R^2	Number of obs.
Transportation & storage	1.062***	0.923***	– 1.084***	– 0.118	– 1.679***	– 10.216***	0.900	256
	(0.030)	(0.029)	(0.053)	(0.114)	(0.265)	(0.477)		
Transportation margins	0.989***	0.831***	– 1.279***	– 0.128	– 0.870**	– 7.730***	0.756	234
	(0.050)	(0.049)	(0.091)	(0.182)	(0.420)	(0.759)		
Wholesale margins	1.268***	0.829***	– 1.267***	– 0.196	– 0.977***	– 9.902***	0.892	256
	(0.035)	(0.033)	(0.061)	(0.132)	(0.310)	(0.560)		
Retailing margins	0.829***	0.584***	– 1.366***	0.365**	– 3.430**	– 3.502***	0.690	192
	(0.057)	(0.051)	(0.111)	(0.181)	(0.409)	(0.750)		
Hotels & restaurants	0.808***	0.846***	– 1.192***	– 0.043	– 2.758***	– 6.878***	0.851	250
	(0.032)	(0.032)	(0.058)	(0.123)	(0.287)	(0.515)		
Business services	1.426***	0.629***	– 1.345***	– 0.221	– 2.361***	– 9.617***	0.805	231
	(0.052)	(0.047)	(0.085)	(0.177)	(0.423)	(0.784)		
Financial services	1.272***	1.057***	– 0.812***	– 0.498***	– 1.064***	– 15.876***	0.908	261
	(0.031)	(0.033)	(0.058)	(0.127)	(0.298)	(0.530)		
Communication services	0.957***	0.953***	– 0.476***	– 0.134	– 0.691***	– 14.134***	0.919	257
	(0.024)	(0.025)	(0.043)	(0.094)	(0.219)	(0.422)		
Private education services	0.619***	0.483***	– 0.763* **	0.145	– 3.262***	– 5.742***	0.636	166
	(0.048)	(0.047)	(0.090)	(0.154)	(0.407)	(0.607)		
Health & social services	0.776***	0.207***	1.039***	– 0.059	– 1.189	– 2.976**	0.452	99
	(0.092)	(0.086)	(0.174)	(0.251)	(0.746)	(1.170)		
Other services	1.199***	0.727***	– 1.244***	0.080	– 2.353***	– 9.392***	0.837	226
	(0.043)	(0.040)	(0.075)	(0.148)	(0.346)	(0.625)		

Standard errors in parentheses. ***,**,* denote statistical significance at the 1%, 5%, and 10% level, respectively.
Source: Canadian Statistics (2003).

Intra-services trade within the European Union

We have also explained the bilateral trade patterns for services and goods in the European Union using the gravity model see equation (3.1). Table 3.3 shows that the coefficients for GDP are smaller than 1. Compared to the regressions for Canada, the coefficient for GDP of the origin country is much lower. The home market effect dominates only slightly the foreign market effects for trade in goods. For services trade, the foreign market effect is even a bit stronger than the home market.

The coefficients for distance are slightly lower than 1 in absolute value. For trade in goods, distance seems to matter more than for services in the EU. The differences in values for the coefficients are not large, but statistically significant. The language dummy is significant but

does not explain much of the variation in bilateral export flows. It is for goods a bit higher than for services. Adjacency of countries is more important for trade in goods than for trade in services.

Table 3.3 Intra-EU trade: goods and services, 1999-2001

Dependent variable: exports of	Services	Goods	Goods and services
GDP origin	0.750***	0.797***	0.770***
	(0.027)	(0.026)	(0.021)
GDP destination	0.769***	0.750***	0.765***
	(0.027)	(0.026)	(0.021)
Distance	– 0.922***	– 0.988***	– 0.928***
	(0.066)	(0.062)	(0.051)
Language dummy	– 0.238**	– 0.275**	– 0.259***
	(0.121)	(0.114)	(0.093)
Adjacency dummy	0.210***	0.311***	0.297***
	(0.095)	(0.089)	(0.073)
Product Market regulation, origin country	– 0.174***	– 0.185***	– 0.138***
	(0.058)	(0.055)	(0.045)
Product Market regulation, destination country	– 0.270***	0.066	– 0.010
	(0.058)	(0.055)	(0.045)
Year 2000 dummy	0.104	0.124**	0.130**
	(0.066)	(0.062)	(0.051)
Year 2001 dummy	0.157**	0.092	0.133***
	(0.066)	(0.062)	(0.051)
Constant	– 5.636***	– 4.572***	– 4.517***
	(0.767)	(0.723)	(0.592)
Adjusted R^2	0.854	0.876	0.909

***,**,* denote statistical significance at the 1%, 5%, and 10% level, respectively.
Source: OECD (2003a and b) and CEPII. Number of observations is 486.

The variability of the trade flows between different countries also permits us to analyse the role of regulation. Of course, this is almost impossible for inter-provincial trade, because most of the regulation is determined at the federal level. Mirza and Nicoletti (2003) already show that the level of product market regulation is relevant for trade. This analysis concludes that product market regulation in the origin country is relevant for trade in goods and services. The sizes of the coefficients are not statistically different. The lower the level of regulation, the larger the trade flows are. The reason is that a high level of product market regulation curbs the number of firms and thereby competitiveness. Firms in countries with a low level of product market regulation are probably more competitive, nationally and internationally.

For services trade, the level of product market regulation in the destination country is also a trade barrier. More regulation hinders imports, because exporters have to fulfil more conditions. However, this is not the case for trade in goods. This difference could be explained be the fact that goods are less confronted with regulation than services. It could also explain that the

internal market in goods functions well in the EU, but the internal market for services not, as EC (2002) already suggests.

In our estimations, the product market regulation in the destination country seems to be more important than that in the origin country. Mirza and Nicoletti (2003) draw the same conclusion. We have to be careful here because this result depends strongly on the indicator for product market regulation that is used in the empirical analysis.[18]

Note that the gravity equation explains less of the variation in the EU bilateral trade data than in the Canadian data. However, the gravity equations explain the variation in services trade nearly as well as goods trade. The year dummies are sometimes significant, but do not contribute much to the explanation of the variation in intra-EU trade.

We have also run these regressions for four sub-sectors in services: Transport services, Other commercial services, Travel and Government services. Table 3.4 presents the results. For government services and Travel, distance seems to be less hampering trade than for Transport and, in particular, Other commercial services. These results confirm to some extent the ones we have seen for inter-provincial services trade in Canada. For trade in Health and social services (a part of Government services), distance matters less than for Transport. The high coefficients for distance in Retail margins, Wholesale margins and Business services are in the EU reflected by the high coefficient for Other commercial services. The coefficient for language dummy is significant except for Transport services.

The relatively low coefficient for GDP of the origin country in Government services, Travel, and Transport services is remarkable, compared to the one for GDP of the destination country. In all three sectors, the foreign market effect dominates. For Government services, this model specification does not explain much of the data variation. Moreover, trade in this sector is likely to be determined to a far higher extent by diplomatic and political motives than trade in other services sectors.

For Travel, it makes sense that the wealth in the destination country from which the tourists and business visitors come is more important than the country in which travel expenses take place (origin country in terms of services exports). The Canadian sector Hotels & restaurants also has a higher coefficient for GDP of the destination country than for GDP of the origin country in the regression. That sector is closely related to Travel in the OECD data.

For Transport services, the demand in the receiving countries seems to be more important than the market size in the home country. Adjacency is only significant for Travel. People tend to visit neighbour countries relatively more corrected for distance and market size.

[18] E.g. Nicoletti et al., 2003, conclude that the level of product market regulation in the origin country is more important.

Product Market Regulation (PMR) is a determining factor in Other commercial services, Travel and Government services. For Other commercial services, a high level of PMR in the origin country curbs exports. For Travel, a high level of PMR in the origin country seems to stimulate exports. This could be due to a misspecification of equation (3.1) for Travel. The point is that many popular tourist destinations such as Italy, Greece, and Spain are also the ones with a relatively high level of regulation. The attractiveness as tourist country is also explained by factors like the weather conditions, culture, and other leisure opportunities, and less by the level of regulation. Note, that the present specification of Travel explains also less of the variation of the data than other sectors like Transport and Other commercial services.

Table 3.4 Intra-EU trade: sub-sectors in services, 1999-2001

Dependent variable: exports of	Other commercial services	Transport services	Travel	Government services
GDP origin	0.880***	0.753***	0.772***	0.650***
	(0.034)	(0.033)	(0.038)	(0.058)
GDP destination	0.736***	0.863***	0.896***	0.825***
	(0.034)	(0.033)	(0.038)	(0.056)
Distance	– 1.238***	– 1.141***	– 0.403***	– 0.840***
	(0.084)	(0.080)	(0.092)	(0.131)
Language dummy	– 0.322**	0.053	– 0.641***	0.636**
	(0.153)	(0.146)	(0.168)	(0.250)
Adjacency dummy	– 0.190	0.093	0.923***	– 0.198
	(0.120)	(0.114)	(0.132)	(0.184)
Product Market regulation, origin country	– 0.491***	– 0.102	0.351***	– 0.082
	(0.074)	(0.071)	(0.082)	(0.128)
Product Market regulation, destination country	– 0.128*	– 0.045	– 0.400***	– 0.427***
	(0.073)	(0.071)	(0.082)	(0.116)
Year 2000 dummy	0.123	0.090	0.112	0.158
	(0.083)	(0.080)	(0.093)	(0.138)
Year 2001 dummy	0.233***	0.035	0.072	0.168
	(0.083)	(0.080)	(0.093)	(0.138)
Constant	– 5.328***	– 7.520***	– 13.013***	– 11.241***
	(0.970)	(0.929)	(1.072)	(1.570)
Adjusted R^2	0.822	0.816	0.77	0.570
Number of observations	481	486	486	371

***,**,* denote statistical significance at the 1%, 5%, and 10% level, respectively.

Source: OECD (2003a and b) and CEPII.

4 Services trade in the European Union and Canada

The internal market for services in the EU does not function well. Service providers are hampered by many barriers if they want to export or to set up a foreign affiliate. Kox et al. (2004) argue that most of these barriers result from the heterogeneity in national regulations. As a consequence, service providers have to comply with all regulatory and administrative procedures at each national market they want to enter. This heterogeneity in regulation will be much less pronounced in Canada. Although each province has its own regulation to some extent, the federal government provides an overall framework for regulation. Moreover, differences in culture and lack of information contribute to the regulatory barriers in the EU. This is of course less relevant in Canada.

This section compares services trade within Canada and the EU. We assume that the (inter-provincial) services market in Canada functions well. If we take the services market in Canada as a benchmark, to what extent can the internal market in the EU improve? What is the scope for intra-EU services trade? The potential for EU services trade, if the internal market functions as the Canadian service market can be considered as a kind of maximum effect. It is very likely that this maximum is not attainable, because Canada is one country with a federal structure and more or less one culture. The European Union consists of at least twenty-five members with its own culture and regulatory structures. The present proposal of the EC (2004) to improve the functioning of the services markets is ambitious, but of course not as far-reaching as the functioning of the services markets within Canada.

Another issue that complicates the comparison of Canada and the EU is the different scale. Geographically, Canada is larger than the EU, but in terms of population and GDP the sizes are completely different. Canada has about 31 million inhabitants, while the EU15 has about 380 million. The largest province of Canada, Ontario, has 12 million inhabitants, and the four smallest less than a million. So, the population density differs substantially. From that perspective, it would make more sense to compare the EU with the United States (US). However, the US does not provide data on federal trade in services.

In spite of these difficulties, we compare Canada and the EU, and also trace the limits of such a comparison. In order to prevent too bold conclusions on the comparison of the services markets, we also compare the goods markets of both territories. First, we present some basic data on services trade. Second, we apply the results of the Canadian services trade to the EU. Third, we combine all data in one data set and investigate whether EU intra-trade is significantly lower.

Table 4.1 presents total intra-services trade, inter-services trade and GDP for the EU15 and Canada for 1999. It is clear that the economy of the EU is much larger. The EU population is

also about ten times as high as in Canada. The value of intra-services trade is only about 4% of GDP. That is twice as low as inter-provincial trade in Canada. External services trade is, however, larger in the EU. A first conclusion is that intra-services trade in Canada is significantly higher than in the EU. It is not clear whether this is due to better functioning services markets in Canada or to the differences in size between the countries or distances. We know that small regions trade more than large regions, because the latter regions have a large internal market. Because the size (in terms of GDP and population) of the EU15 countries is much larger than the average province in Canada, intra-trade flows are possibly smaller in the EU than in Canada.

Table 4.1 Basic data on trade in services, 1999

	EU15		Canada	
	Billion US$	% GDP	Billion US$	% GDP
Intra-services trade	336	3.9	60.7	8.6
Inter-services trade	610	7.1	36.8	5.2
GDP	8541		704.8	

Source: OECD (2003a) and Canstat, Canadian data are converted to US dollars.

Assuming that the gravity equation explains the bilateral services trade patterns in Canada quite well, what does this imply to bilateral services trade in the EU? We use the regression results for bilateral services trade in Canada (table 3.1) to predict services trade within the EU. We substitute average GDP of the country of origin and destination, and average bilateral distance in the EU in the estimated gravity equation. Hereby, we correct for differences in units (Canadian $ versus US$ and miles versus kilometres). Table 4.2 presents the results.

Table 4.2 Predicted intra-EU trade flows in goods and services

Category	Language dummy	Predicted bilateral intra-EU trade flow (on average, in billion US$)	Relative difference with actual flow (100%)
Goods	no	32.2	3.1
Goods	yes	27.8	2.7
Services	no	28.3	15.5
Services	yes	5.7	3.1

Source: Own calculations based on results in table 3.1 and OECD (2003a and 2003c).

Table 4.2 shows that the regression results of the data set for intra-trade in Canada predict much larger trade flows within the EU than the actual flows if we ignore language differences. The problem of the language dummy is twofold. First, it does not only take account of the language difference between Quebec and the other provinces in Canada, but also of other provincial differences. Second, we do not have a clear indicator for the language difference as we have for the differences in European languages. The latter is based on Belot and Ederveen (2004). We

assume that the language difference between French-speaking Quebec and the other English-spoken provinces is the same as between France and Great Brittan. If this is not correct, the estimate for the coefficient of the language dummy will change and this will affect the products results in table 4.2.[19]

For goods trade, it makes nearly no difference if we take account of language differences or not, because the coefficient is statistically insignificant. Based on the estimation results for Canada, we predict that goods trade within the EU has to increase by about 300%. That is a lot, in particular because we have the idea that the internal market for goods functions well. Although we could imagine that cultural and language differences and differences in economic regulation hurt trade to some extent, a threefold increase is not very likely. Probably, this effect is inflated because the prediction of EU trade is an out-of-sample prediction.

For services trade, the predicted intra-EU trade is heavily affected by the inclusion of language as explanatory variable. Without language dummy, we expect an increase by a factor 15 and with language dummy it is a factor 3. In the latter case, the increase is comparable to that of intra-EU goods trade. However, it is difficult to interpret the language dummy. In the former case, the increase is unbelievably high.

This difference can occur if the relation between bilateral trade and market size is not linear, because large countries trade less than small countries. In the EU, the size of GDP and trade are much higher than in Canada. That is not only true for the EU15 and Canada, but also for the underlying EU countries and Canadian provinces. In that respect, the prediction with EU data does not fit into the sample of the Canadian data. This could be a reason that the model is not very well specified or at least not estimated for that size of numbers.

If we assume that the internal market for goods functions equally well in the EU as in Canada, we could interpret that factor 3 of goods trade is the effect of the out-of-sample prediction or misspecification. Assume that this also holds for services by about the same factor. Then, intra-EU services trade would increase by about factor five (15.5/3.1) if the markets would perform as smoothly as in Canada, and ignoring language differences.

Pooled data set

We have also pooled the Canada and EU data set together such that we have a database of 756 observations. On top of the regular variables, the equation that is estimated for this pooled data set contains a dummy variable for intra-EU trade flows. The variable equals unity for flows within the EU. Moreover, we have included population density of the regions in the specification. The reason is that trade distances are probably larger in less populated provinces in Canada.

[19] It is most likely that the language difference is smaller. Then the coefficient of the language dummy will be correspondingly higher than the one in table 3.1, and the predicted intra-EU trade flows will be lower.

The EU dummy variable tells us whether the size of a trade flow in the EU differs significantly from that in Canada, independent from what the values of the other variables will be. As can be seen from table 4.3, the value of the EU dummy variable for total services lies between – 2.9 and – 2.6 dependent of including the language dummy and population densities. It tells us that a trade flow taking place within the EU will be about 5% to 8% of a trade flow between a Canadian pair of provinces with identical characteristics as the EU pair of countries. That is very little, and not very plausible.

Table 4.3 Canada and EU intra-trade in goods and services

Exports of	Goods	Goods	Goods	Services	Services	Services
Constant	– 4.181***	– 4.211***	– 3.804***	– 4.777***	– 4.885***	– 4.680***
	(0.394)	(0.398)	(0.413)	(0.416)	(0.420)	(0.437)
GDP origin	0.926***	0.926***	0.938***	0.928***	0.927***	0.927***
	(0.019)	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)
GDP destination	0.781***	0.781***	0.796***	0.798***	0.797***	0.811***
	(0.019)	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)
Distance	– 1.102***	– 1.098***	– 1.163***	– 1.023***	– 1.009***	– 1.041***
	(0.038)	(0.038)	(0.043)	(0.040)	(0.040)	(0.045)
Adjacency dummy	0.202***	0.201***	0.127*	0.032	0.029	– 0.006
	(0.072)	(0.072)	(0.075)	(0.076)	(0.076)	(0.079)
EU dummy	– 1.854***	– 1.733***	– 1.346***	– 2.905***	– 2.789***	– 2.589***
	(0.083)	(0.107)	(0.156)	(0.093)	(0.113)	(0.165)
Product market regulation origin region	– 0.164***	– 0.161***	– 0.142***	– 0.143***	– 0.132***	– 0.120**
	(0.056)	(0.057)	(0.057)	(0.060)	(0.060)	(0.060)
Product market regulation destination region	0.083	0.086	0.103*	– 0.247***	– 0.237***	– 0.231***
	(0.056)	(0.057)	(0.057)	(0.060)	(0.060)	(0.060)
Language dummy		– 0.054	– 0.145		– 0.189*	– 0.236**
		(0.100)	(0.102)		(0.105)	(0.109)
Population density origin region			– 0.065**			– 0.004
			(0.026)			(0.028)
Population density destination region			– 0.076***			– 0.068**
			(0.026)			(0.028)
Adjusted R^2	0.932	0.932	0.933	0.897	0.900	0.898
Trade increase (= exponent of EU dummy)	6.4	5.7	3.8	18.3	16.3	13.3

Sources: see table 3.1 and 3.4. Number of observations is 756.

The regressions for bilateral trade in goods also have a significant and large EU dummy between – 1.9 and – 1.4. This implies that a trade flow in the EU15 would be a factor 6 (about 16%) to 4 lower than in Canada between regions with identical characteristics. As mentioned earlier, GDP of the EU countries is much larger than GDP of the Canadian provinces. This is also true for the bilateral trade flows (not in relative terms). The EU dummy does not only signals differences in trade flows due to differences in the functioning of markets, but also the differences in the size of countries, in spite of the inclusion of population density. Therefore, we

can not interpret the EU dummy as an indication for trade flows in the EU if the internal market for services would function in a similar way as in Canada.[20]

We have checked whether the difference in size of the variables matters by applying a Chow test. The null hypothesis of the Chow test suggests that there is no structural break between the observations of the Canadian and EU data. This hypothesis was clearly rejected.

We can say something about the differences between intra-services trade in the EU and Canada if we assume that the EU dummy for trade in goods fully reflects the differences between the EU and Canadian data. If the goods trade increase of a factor 3.8 to 6.4 would represent the real data, EU services trade could increase by a factor 2.9 (18.3/ 6.4) to 3.5 (13.3/3.8) if it took place in Canada. The size of the factor is somewhat lower than the result we have found earlier by forecasting the EU services trade flow based on the regression results for Canada ignoring language differences.

The size of the EU dummy diminishes if a language dummy and population density variables are incorporated. That makes sense. Intra-trade is lower in the EU than in Canada. To some extent, that can be explained by the different languages in the EU. This reduces thus the size of the EU dummy. Further, the EU member states have a higher population density than the Canadian provinces. This has also a negative effect on the absolute size of the EU dummy.

We have also introduced GDP per capita for the region of origin and destination in the specification to account for differences in income. That only affected the results marginally. Moreover, we have included the openness of the regions in terms of goods trade in the specification for services trade. The idea was that this variable controls for the fact that larger regions trade less. However, also this extension has not affected the results significantly.

[20] From that perspective it would be interesting be use bilateral trade data of the states in the US and to compare that with the EU data. The size of these states is better comparable to those of Europe. However these data are not available.

5 Conclusions

The determinants and hindrances of services trade are not very well understood. Trade in services is relatively low compared to that in goods, in particular given the importance of services in value added. One reason for the relatively modest trade flows in services are the characteristics of services. The use of a service often needs the proximity of consumers and producers. However, this does not explain everything. Trade in services is also hampered by differences in regulations between countries, different cultures and so on. It is difficult to quantify these differences in regulations and their impact on cross border trade in services.

Empirical analyses of services trade are scarce. The reason is that these data are recently constructed. We are one of the first to analyse bilateral trade in services using the gravity equation. For both Canada and the EU, we find that the gravity equation explains the size of the trade quite well in terms of its determinants: market size (GDP) of the origin and destination country and distance. On average, distance seems to matter less for services trade than for goods trade. The Canadian data have also shown that distance is relatively unimportant in sectors like Communication services, and Financial services. In Retail margins and Business services distance seems to be much more important.

We are in particular interested in the functioning of the internal market in services in the EU. According to the EC (2002) it functions poorly. How much could trade increase if it would function like in Canada? Canada is a benchmark because of data availability: inter-state data of the US are not available. Inter-provincial trade are twice as large as intra-EU services trade measured as share of GDP. This suggests that services trade is less hampered in Canada than in the EU. We have checked this using the gravity equation. We have encountered the problem that the size of the data like GDP and export differs a lot between Canadian provinces and EU countries, although the economic activities of the largest provinces are comparable to those of smaller EU countries. As a control variable, we have compared trade in total goods within Canada and the EU. The results suggest a threefold increase in actual EU intra-trade for goods. However, these out-of-sample predictions are not so accurate. This is also true for services trade. If we take the results for goods trade as a measure of error in the regression analysis, EU services trade could increase by three of five times actual trade. The order of magnitude of this trade potential seems plausible and fits very well to the differences in intra-services trade between Canada and the EU.

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Appendix

The data set on inter-provincial trade covers the years 1997-1999 and includes ten provinces and two territories. Twenty-four service sub-sectors are discriminated and the data are consistent with the national accounting framework. The data are compiled from several sources (Statistics Canada, 2002). However, in many cases proxies are used, because data are often not available. The sources of the data and proxies are discussed below.

Both administrative statistics and surveys are used. The main source of the administrative statistics is the Merchandise Trade of Canada statistics. The main sources for the survey data are the destination of shipment from the Annual Survey of Manufacturers, the Wholesale Trade Commodity Survey by Origin and Destination, the destination of sales from the Survey of Service Industries, and out-of-province expenditures from the Canadian Travel Survey.

Besides the survey and administrative data, provincial supply and demand statistics of the provincial accounts are used. In constructing the provincial input-output-tables several accounting identities should hold. For example 'total domestic supply' should be equal to 'sales to the rest of the world', 'sales to other provinces' and 'sales within its own province'. Moreover 'total domestic demand' for each province and each commodity must be identical to 'purchases from the rest of the world', 'purchases from other provinces', and 'purchases from its own province'.

In the data set services are categorised into transportation and travel, communication, business services, financial services, wholesale and retail margins and personal and recreational services (Statistics Canada, 2002). For *transportation services* the main data source are origin/destination data by carriers. Inter-provincial trade in air transportation is derived from origin/destination of passenger traffic volume, supplied by STC Transportation Division. Inter-provincial trade patterns for truck, rail and water transportation are derived from statistics on the origin and destination of goods transported by the respective carriers; these statistics are also compiled by STC Transportation Division. Trade patterns for transportation margins are estimated by combining origin/destination statistics for the three major modes of transport (truck, rail and water). Trade flows in *travel* are derived from the Canadian Travel Survey. Trade for pipeline transportation reflects movements of oil and gas as provided by STC Energy Section. Finally, grain storage is based on the flows of the major grain commodities (wheat, barley and other grains).

Trade flows in *communications* are constructed for telephone and telecommunications, and postal services, radio and television broadcasting as well as cable and other subscription programming. Inter-provincial trade patterns for postal services are obtained from Canada Post data on origin and destination of the quantities transported among the provinces. Trade patterns for national and network advertising sales are allocated provincially using provincial demand for advertising services as a weighting factor. Trade flows for cable and subscription

programming are derived from provincial demand for specialty services and direct-to-home satellite service.

Trade patterns for business and computer services are based on the destination of sales from the STC annual surveys of various services industries. These data are used for many services ranging from architectural services to computer services to travel agents to advertising services.

Inter-provincial trade flows for financial services are derived from a number of perceived economic situations and relationships within the Canadian economy. For example, in the case of imputed banking services (interest charged on loans less interest paid on deposits), the production of these services for persons and for small businesses are mostly assumed to be absorbed within the province of production; the output of banking services for large corporations and governmental institutions are allocated to the province of destination using domestic demand for these services as an indicator of trade. For selected financial services, total inter-provincial trade flows are used as a pattern.

Inter-provincial trade distributions for wholesale margins (mark-ups of wholesalers) are based on the Wholesale Trade Commodity Survey by Origin and Destination; the location of the wholesaler represents the province of origin, and the destination of wholesale sale represents the destination of the wholesale margin. Retail margins are mostly consumed within the province these margins originate. The inter-provincial trade patterns for retail margins are estimated from results of the early-nineties survey of growing small and medium-sized enterprises; the survey provides the proportion of out-of-province sales of small to medium-sized retailers.

Various recreation and personal services can be exported when consumed by non-residents (travel and tourism). Inter-provincial trade in these services are derived from the Canadian Travel Survey which contains information on the province of origin of travellers and province of travel expenditures by broad expenditure categories such as transportation fares, vehicle operations, accommodations, restaurants and drinking places. These categories are allocated to appropriate commodities such as accommodations, meals, alcoholic beverages consumed on licensed premises, motor vehicle rentals as well as recreation and entertainment services.