The Determinants of Trade Agreements in Services vs. Goods*

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Abstract

Since Baier and Bergstrand (2004) there has been a focus on empirically testing the economic determinants of signing a free trade agreement (FTA). However, FTAs do not imply an agreement on services; a separate economic integration (EIA) is needed. As trade in services is one of the fastest growing sector of the global economy, it is important to pay special attention these agreements. We update the analysis of Baier and Bergstrand (2004) incorporating more countries and agreements. But, more importantly, we allow for the signature of an FTA to be a different choice then signing an EIA. We ask the question, why do some countries sign an agreement to liberalize both goods and services, while others only liberalize trade in goods?

JEL classification: F14, F15.

Keyword: Regional Trade Agreements, Services, Qualitative choice.

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1 Introduction

The Trade literature has widely focused on how the signing of trade agreements impacts the amount of trade in goods between the two countries and consequently the welfare within these countries. However, less attention has been paid to the economic factors that encourage two (or more) countries to sign such trade agreements - and even less towards why countries sign an agreement with respect to services trade. With regards to trade agreements in goods, Baier and Bergstrand (2004), or B-B, were the first to provide empirical evidence indicating which geographical and economic characteristics affect the likelihood of a pair of countries having a free trade agreement (FTA). The predictions of their model are based on a numerical version of the theoretical models of Krugman (1991) and Frankel et al. (1995) and covers agreements that have been signed up until 1996 with a sample of 54 countries. Since 1996, more than 80 agreements have been signed and the economic characteristics of countries may have changed**.** However, this is not our main contribution as B-B has already been extended in various contexts.[1]

Though B-B allow for the trade in services in their theoretical model, FTAs do not actually cover services and thus this aspect is missing from their empirical analysis. In fact, prior to 1996 (the year used in B-B), only five agreements included both goods and services and been signed. If two countries want to liberalize trade in services, a separate agreement is needed; that is, the countries must sign an economic integration agreement (EIA).[2] Since the year 2000, trade in services have increasingly become the subject of bilateral and multilateral trade negotiations. For instance, in 2011, there were ten trade agreements signed and 7 of those included services. The need for such agreements stems from such a recent increase in services trade. According to the World Trade Organization (WTO), trade in services represent the fastest growing sector of the global economy and account for two-thirds of global output, one-third of global employment and nearly 20% of global trade. The Figure 1

[1] See for example, Baier et al. (2011), Baldwin and Jaimovich (2010), Chen and Joshi (2010), Bergstrand et al. (2009), and Egger and Larch (2008).

[2] The terminology we use is based on the World Trade Organization classification of trade agreements.

allows us to have an overview of the importance of services in the bilateral and plurilateral negotiations. Thus, understanding the determinants of agreements on trade in services is an important topic and contribution of our paper.

There are two important points that need to be made with regard to the distinction between agreements concerning services and goods. The first is that, unlike goods, services are not restricted by tariffs, but by market access. When an agreement is signed, the number of firms allowed in an industry is predetermined, but the quantity provided by each firm is determined by the market. The second point, that will be discussed in more detail later, is that unlike an FTA (that implies zero tariffs on all goods), an EIA does not necessarily translate to full market access for *all* or even one type of service. To understand this, we need to first describe what trade in services are defined. There are four defined ways, or "modes", of trading services:

- Mode 1: Cross-border supply – the possibility for non-resident service suppliers to supply services cross-border into the Member's territory (e.g. bank transfers).
- Mode 2: Consumption abroad – the freedom for the Member's residents to purchase services in the territory of another Member (e.g. tourism).
- Mode 3: Commercial presence – the opportunities for foreign service suppliers to establish, operate or expand a commercial presence in the Member's territory, such as a branch, agency, or wholly-owned subsidiary (e.g. foreign direct investment).
- Mode 4: Presence of natural persons – the possibilities offered for the entry and temporary stay in the Member's territory of foreign individuals in order to supply a service (expatriates).

It is clear that trade in goods is quite different then trade in services and though more recent agreements are covering both goods and services, it is not always the case an FTA and an EIA are automatically signed jointly. For instance, EFTA members and Canada negotiated an FTA in 2009 without an EIA, while Panama and Chile decided to include both

goods and services in a bilateral trade agreement signed in 2008.[3] However, the decision to include goods and the decision to cover services are not necessarily independent either. For instance, Lennon (2009) finds that bilateral trade in goods explains bilateral trade in services with a positive estimated elasticity close to one. Moreover, depending on a country's economic orientations, that is to say manufacturing-based economy or services-based economy, whether or not to include services can lead to bargaining in the context of both bilateral and multilateral negotiations. Therefore, in addition to evaluating the economic determinants of trade agreements that cover services, another contribution of this paper is to investigate any interdependence between an FTA and an EIA.

The structure of the paper is as follows. In the next section, we explain in more detail the particulars of an EIA and present the literature related to determinants of trade agreements to provide theoretical intuition of expected results. Section 3 covers the empirical strategy and the data used. In Section 4, we present our estimation results and Section 5 concludes.

2 EIA and Theoretical Background

As mentioned the characteristics of an EIA are very different than that of an FTA. Consequently, it is quite difficult to create one general theoretical model that incorporates all of nuances of an EIA. Therefore, we first describe in detail what an EIA is and then rely on various theoretical models to provide the basis for our theoretical predictions.

2.1 What is an EIA? Services under negotiations

From the ambitious aim of liberalizing service sectors and developing multilateral trade in services amongst WTO members, the main principles of the General Agreement on Trade in Services (GATS) are most-favored nation (MFN) treatment, transparency, national treatment and market access. These principles should be applied to all members and sectors

[3] EFTA members are Iceland, Liechtenstein, Norway and Switzerland since 1970.

(*horizontal commitments*). Moreover, commitments can be applied only to one sector and/or country (*specific commitments*). Sectors included in the agreement are various and comprise of a large array of economic activities. The twelve sectoral classifications include: business services; communication services; construction and related engineering services; distribution services; educational services; environmental services; financial services; health related and social services; tourism and travel related services; recreational, cultural and sporting services; transport and other services. Note that this list is very detailed; for example, communication services sector encompasses 24 sub-sectors. In addition to sectoral classification, the GATS defines four different modes of services supply that we have defined in the Introduction.[4] In modes 1 and 2, the services providers are not located in the same country as the consumers; while in modes 3 and 4, the suppliers are present within the country.

The coverage of sectors committed to liberalization decided by members can be limited. For instance, every member is allowed to schedule MFN exemptions to a given sector and/or country just by notifying it to the WTO, and then apply horizontal or specific limitations to some, or even all, services. According to Adlung and Roy (2005), out of 160 sub-sectors, 106 are committed, on average, by developed countries members and 42 sub-sectors are committed by developing countries, in 2005. Interestingly, amongst country groups, the average number of sub-sectors committed varies significantly, from 87 to 117 for developed countries, and from 1 to 123 for developing economies. Besides, the coverage of sub-sectors committed is substantial for new members (countries acceding after 1995): 103 on average ranging from 37 to 149. While market access limitations in mode 3 resemble closely in all country groups, they find that developing countries are more likely to restrict national treatment to foreign providers. Seemingly, there is no a homogeneous coverage of GATS commitments amongst WTO members. Because of public interest concern, some countries may be reluctant to open their trade and investment in services. Indeed, in liberalizing education, health services, water supply or environmental services to foreign competition,

[4]The entire legal text is available on http://www.wto.org/english/docs_e/legal_e/26-gats_01_e.htm.

the impacts on cost and availability could be detrimental to the consumers. In addition, more commitments cover capital mobility than labor mobility what may lead to asymmetric liberalization between developed and developing countries.

Despite good intentions, the degree of liberalization achieved by the GATS is relatively modest, letting untapped gains for developing and developed countries that bilateral and multilateral EIAs try to capture. Regarding bilateral negotiations on services, signatories face the same difficulties and the same reservations as that of multilateral negotiations. The content of an EIA is very similar to that of the GATS with regard to market access, national treatment, most-favored nation, local presence requirement, right of establishment, performance requirements and senior management and boards of directors obligation, grant and limitations on the entry of workers depending on the categories, transparency and domestic regulation among others.

There is a clear tendency to include services in the negotiations, but even recently, some trading partners still chose voluntarily not to launch into negotiations in terms of services. Therefore, whether or not countries negotiate on services is not exclusively determined by the year of entry to force (before or after 1995). Countries signed agreements on services at a higher rate than agreements on goods. In only fifteen years (from 1995 to 2010), the number of EIAs increased to 65 agreements in force that took more than thirty years for FTAs/CUs. The growth has been faster in terms of agreements including services, without preventing countries from signing pure FTAs. This can be seen from Figures 2 and 3. In particular, Figure 3 illustrates that it is clear, as a share of agreements signed, services are playing a more prominent role, however there are still agreements signed that only include goods.

2.2 Related literature

We base our approach on B-B in which they provide a theoretical framework to explain the signature of FTAs between countries. In a six-country model with imperfect competition,

B-B extend Krugman (1991) and Frankel et al. (1995) models. The set up is a basic Heckscher-Ohlin model characterized by two factors of production and two activities (goods and services). All firms have the same technology and maximize profits. Goods sector is capital intensive, while services are labor intensive. In each country, a representative consumer with Dixit-Stiglitz preferences maximizes utility. These six countries are located on three continents (two countries on each). Each country has to face intercontinental but also intracontinental trade costs which are null in Krugman (1991) and Frankel et al. (1995) frameworks. They assume that trade within a given continent costs less than trade between continents.

Several testable predictions arise from B-B's simulations. It relies on positive trade costs, asymmetric country sizes and factor endowments. The welfare gain from an FTA increases as the bilateral distance decreases, as both countries are remote from the rest of the world and have similar economic size. Nevertheless, the economic size of the rest of the world matters as well. When two large countries conclude an agreement, the gain will be lower. Trade diversion is more likely to occur when factor endowments differ significantly across partners, and across the country pair compared with the rest of the world. Using cross-section data for the year 1996 and 1,431 country-pairs, B-B confirm their predictions. Moreover, for 80% of country-pairs, their model predicts correctly the signature of FTA (or the absence thereof). Compare to B-B, we extend our analysis to EIAs in considering all the FTAs and EIAs recently signed.

Similarly to FTAs, other agreements, such as Preferential Trade Agreements (PTAs) and bilateral investment treaties (BITs), tend to be caused by analogous determinants. Bergstrand et al. (2011) examine the timing of the formation and enlargement of PTAs. They find that geography through distance and contiguity, and the economic size of signatories determine PTAs signature. Moreover, the degree of regionalism the partners face also matters. In introducing the minimum geographical distance and the number of members of the nearest PTA, Baier et al. (2011) highlight that regionalism is endogenous as a

hump-shaped relationship exists between the number of members of the nearest PTA and the timing of PTAs. According to Bergstrand and Egger (2011), the decision to sign a BIT more likely to occur when countries are similar and large in terms of economic size, relatively close geographically without having a common border and language. Political stability and capital-labor ratios widely different are important factors to determine the probability to have a BIT. Similarly, Baldwin and Jaimovich (2010) conclude that Free Trade Agreements are contagious. In addition to economic and geographical determinants, political and contagion index explain FTAs formations. This contagion index between country i and j is based on the shares of total exports between i and other partners that have already signed a trade agreement with country j in the past. Thus, the spread of regionalism is related to domino theory developed by Baldwin (1993). Therefore, we also examine economic, geographic and political determinants in our empirical analysis to determine the FTAs and EIAs negotiations.

Countries negotiate on goods and on services since the agreement leads to trade creation among partners and to welfare gains. Turning to the services issue, there have been various theoretical models. Markusen and Strand (2008, 2009) adapt the knowledge-capital model (Markusen, 2004) that allows three types of multinational firms (national, horizontal and vertical) to examine the impacts of liberalizing trade and investment in business services. Markusen and Strand's works highlight that liberalizing services is mostly welfare-improving for both countries. However, smaller gains are experienced when trading partners differ widely in terms of economic size and factor endowments. As in B-B, economic characteristics determine significantly the gains of trade liberalization.

Another aspect of negotiations on services is the multilateral feature. Egger and Lanz (2008) investigate the determinants of GATS commitment coverage. Using spatial econometrics, they find that the number of commitments is determined by the commitments expressed by neighbors or large trading partners, economic sizes and capital-labor ratios. Decisions of GATS commitment are interdependent across WTO countries. Large countries and coun-

tries involved in FTAs have higher relative GATS coverage. This seems to indicate that the decision to sign a trade agreement covering goods may depend on the decision to sign a trade agreement covering services.

3 Empirical strategy

3.1 Specifications

Discrete choice models allow us to conveniently test why a country-pair has a trade agreement (see McFadden 1975, 1976). The probability that a given country-pair opts for a particular alternative is based on the comparison of different utilities relative to each alternative. The alternative that provides the highest utility amongst all other alternatives will be chosen. When a country-pair decides to be involved in a bilateral trade agreement, each signatory, maximizing his/her own expected utility, will get benefits from this partnership. If this were not the case, a trade agreement could not have been concluded *a priori*. In this framework, the utility is modeled as a latent variable, y^*, which is unobservable.

$$y^* = \beta_0 + x\beta + e \tag{1}$$

where $x$is the vector of explanatory variables; β, the vector of unknown parameters and e is a normally distributed error term. However, the outcome variable, EIA, is observed.

$$EIA = \begin{cases} 1 \text{ if } y^* > 0 \\ 0 \text{ if } y^* \leq 0 \end{cases} \tag{2}$$

The general form of the response probability that a country-pair chooses the alternative $EIA = 1$ or $EIA = 0$ is as followings:

$$\begin{cases} P(EIA = 1) = P(y^* > 0) \\ P(EIA = 0) = P(y^* \leq 0) \end{cases} \tag{3}$$

Following B-B's specification, for the country-pair ij, the vector x is defined by two geographic variables: $Natural_{ij}$ which is the inverse of distance between i and j and $Remote_{ij}$ which is the simple average of the mean distance between both countries and their partners. This latter variable is obtained from equation 4:

$$Remote_{ij} = dcont_{ij} \times \left\{ \frac{\left[\log\left(\sum_{k=1,k\neq j}^{N} d_{ik}/(N-1)\right) + \log\left(\sum_{k=1,k\neq i}^{N} d_{jk}/(N-1)\right)\right]}{2} \right\} \quad (4)$$

where $dist$ is the bilateral distance in kilometers and $dcont_{ij}$ is equal to one if i and j are located in the same continent, zero otherwise. Economic country sizes are included with $RGDP_{ij}$ and $DRGDP_{ij}$ variables. The former corresponds to the sum of the logs of real GDP of country i and j, while the latter is absolute value of the difference between the logs of real GDP of both countries. Moreover, DKL_{ij} and $DROWKL_{ij}$ variables determine the role of factor endowments. DKL_{ij} is the absolute value of the difference between the logs of capital-labor ratios of country i and j. The variable $SQDKL_{ij}$ is DKL_{ij} squared. To compare with the rest of the world endowments, $DROWKL_{ij}$ is introduced and calculated as the absolute value of the difference between the logs of capital-labor ratios of country i and country j and the rest of the world's capital-labor ratio.

$$DROWKL_{ij} = \frac{1}{2}\left[\left|\log\left[\frac{\sum_{k=1,k\neq j}^{N} K_k}{\sum_{k=1,k\neq i}^{N} L_k}\right] - \log\left(\frac{K_i}{L_i}\right)\right| + \left|\log\left[\frac{\sum_{k=1,k\neq j}^{N} K_k}{\sum_{k=1,k\neq i}^{N} L_k}\right] - \log\left(\frac{K_j}{L_j}\right)\right|\right]$$

We expect that the coefficients for most of these variables to be positive except $DRGDP_{ij}$ and $DROWKL_{ij}$. Neighbor countries are more likely to sign a trade agreement particularly if both are remote from the rest of the world. Similar countries in terms of economic size will get large welfare gain concluding an agreement due to varieties gain. The greater the difference in capital-labor ratios between these countries and intercontinental trade costs are large, the more trade creation is generated due to the trade agreement. Similarly, the

greater the difference of capital-labor ratios between these countries and the rest of the world is small, more trade creation with the rest of the world at the expense of the trading partners will occur.

The capital-labor ratio permits us to evaluate what each country produces and to what extent trading partners are specialized in similar activities. In addition to capital-labor ratios, we construct an export basket similarity index which we discuss in greater detail in section 3.3. According to the law of comparative advantages, a country specialized in a given activity will be a net exporter. Because exports can be disaggregated by sector, the export profile of country indicates the sense of specializations in a finer way. In addition, capital-labor ratio can be less relevant in case of services, as services are a skilled labor intensive activities. Therefore, we also use skilled labor-unskilled labor ratio to consider factor endowments.

We test several specifications, on of which assumes that the decision to conclude a trade agreement on services is dependent on the decision to conclude a trade agreement on goods. In this case, a two-step procedure is an appropriate empirical framework where the first step consists of whether or not a country-pair is involved in a bilateral FTA. If so, the second step is estimated and corresponds to whether or not this country-pair additionally signs an EIA. In the two-step estimation of a bivariate Probit, ϵ and ϵ' are jointly normally distributed with correlatins of ρ. The second step can be written as followings:

$$y' = \beta'_0 + x'\beta' + \epsilon'$$

Thus, the two outcomes are observed:

$$FTA = \begin{cases} 1 \text{ if } y^* > 0 \\ 0 \text{ if } y^* \leq 0 \end{cases} \qquad EIA = \begin{cases} 1 \text{ if } y^{'} > 0 \\ 0 \text{ if } y^{'} \leq 0 \end{cases} \tag{5}$$

As previously, x' is the vector of explanatory variables including $Natural_{ij}$, $Remote_{ij}$,

$RGDP_{ij}$, $DRGDP_{ij}$, and the three alternative measures of factor endowments. We assume that the decision to sign an FTA or not and the decision to sign an EIA or not can be mainly explained by the same variables. However, we expect that the explanatory variables play a different role on both decisions.

3.2 Data

We use the Regional Trade Agreements Information System (RTA-IS) from the World Trade Organization (WTO) to build our variable of regional trade agreements (RTAs).[5] There are several types of RTAs that are notified to the WTO, like Preferential Trade Agreement (PTA), Free Trade Agreement (FTA), Economic Integration Agreement (EIA), FTA-EIA, PSA-EIA, Custom Union (CU) and CU-EIA.[6] To have a comparable baseline in terms of degree of liberalization in trade in goods, we only consider FTAs and CUs. In general, the aim of both FTAs and CUs is that "*each Party shall progressively eliminate its customs duties on originating goods*". The dummy FTA is equal to 1 if two countries are involved in a bilateral FTA in 2012 and 0 otherwise. Additionally, the variable EIA is equal to 1 if two given countries have signed an agreement covering services and 0 otherwise. We use lagged variables for time-varying variable such as real GDPs and factor endowments variables to avoid endogeneity issue. Most of the trade agreements we considered were signed before 2012. Thus, these time-varying variables are potentially impacted by the trade liberalization ensuing the RTA. From the Penn World Tables, we have collected the real GDPs for the year 1995. Using this data, we calculate the difference between GDPs and the sum of GDPs for a given country-pair. However, we have to deal with the fact that some countries are involved in a common custom union and negotiate as a bloc with other countries. This is the case for the European Union, but also of the European Free Trade Association (EFTA).[7] Note that EFTA is not a custom union but the members have signed 18 agreements as bloc since then.

[5] See http://rtais.wto.org/UI/PublicAllRTAList.aspx.

[6] Henceforth, PTAs are called Partial Scope Agreement.

[7] European Union composed of 15 countries is Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.

In these specific cases, the balance power differs as long as countries do not negotiate one by one, but one versus a bloc of countries. To account for these blocs, we generate aggregate countries which represent EU and EFTA by taking the sum of individual country's GDPs and constructing an average distance. For example, the GDP of EU is the sum of its 15 members. The two last enlargements are not considered as most of agreements have been signed before. Baier and Bergstrand (2004) deal with this bloc issue considering the share of world GDP of the countries composing a given bloc.

Following the methodology of Extended Penn World Tables (developed by Marquetti), capital-labor ratios are computed from the estimated capital stock and the number of workers.[8] The calculation of the estimated capital stock (Equation (6)) is based on Perpetual Inventory Method (PIM).[9]

$$K_t^{stock} = \sum_{i}^{T} (1-d)^{T-i} \; I_{T-i} \tag{6}$$

with

$$I_t = Pop_t \; RGDP_t^{pc} \; k_t^i \tag{7}$$

I_t corresponds to the real investment in year t, obtained from real investment share of GDP (k_t^i), real GDP per capita in constant dollars (chain index) noted $RGDP_t^{pc}$, and population (Pop_t) provided by Penn World Tables (PWT).[10] By assumption, the asset life is 14 years (that means $i = 1, ...14$) and the depreciation rate, d is 7.5%. K_t^{stock} is the cumulated depreciated sum of the past investments.

The capital-labor ratio is the estimated capital stock, K_t^{stock}, divided by the number of workers, N_t. From the PWT, the number of workers variable.is approximated as followings.

$$N_t = \frac{Pop_t \; RGDP_t^{pc}}{RGDP_t^{w}} \tag{8}$$

with $RGDP_t^w$, real GDP per worker in constant dollars. From here, three variables are

[8] Extended Penn World Tables are available online. See http://homepage.newschool.edu/~foleyd/epwt/.
[9] This procedure is detailed in OECD (2001) page 100.
[10] Penn World Table version 7.0: http://pwt.econ.upenn.edu/php_site/pwt70/pwt70_form.php.

generated following B-B: DKL_{ij} and $DROWKL_{ij}$.

Cepii provides geographic distances between capital cities, used to generate *Natural* and *Remote* variables.We use the percentage of tertiary schooling attained in population and the percentage of no schooling, primary and secondary schooling attained in population, provided by Barro-Lee educational attainment dataset, to proxy the share of skilled and unskilled workers respectively.[11] These measures are available every 5 years between 1950 and 2010. We collect data on exports baskets in 1995 from UN COMTRADE. Based on exports of 10 industries, we determine the similarities and dissimilarities in export profiles of the countries of our sample doing a HAC analysis. The description of the 10 products are displayed in Table 6. Although we have increasing observations overtime, data on export shares forces us to limit the sample to 100 countries. Finally, the institutional variable State Fragility Index is provided by the Center for Systemic Peace for the year 1995. It is a general index, composed by the security, political, economic and social effectiveness and legitimacies.[12]

3.3 Hierarchical clustering analysis

To classify countries according to their export baskets into clusters, we utilize a hierarchical agglomerative clustering (HAC) on principal components of a factorial analysis with a partitional clustering to generate relatively homogeneous clusters of individuals, countries in this case (see Husson et al. (2010) and Husson et al. (2011) for more details on HACs). Originally, there is one individual per cluster. Using a "bottom-up" agglomerative algorithm, clusters are merged progressively according to the similarities between clusters until to get one cluster with all individuals. The similarities are examined through a set of variables (in which industries every country export). Countries that have similar export characteristics are identified and the more dissimilar pairs of clusters are merged into one cluster. The two representations of the hierarchy of clusters are a dendrogram (tree structure in which each

[11] See http://www.barrolee.com/.

[12] More details are available on http://www.systemicpeace.org/SFImatrix2009c.pdf.

individual is a leaf) and a factor map. In cutting the tree before the root, the sample is partitioned into k clusters. The number of clusters can be chosen according to the general appearance of the tree. Moreover, the number of clusters can be defined as the number of clusters which minimizes the within-clusters variance. The criterion is as follows:

$$Min_{k\,\min \leq k \leq k\,\max} \frac{Within(k) - Within(k+1)}{Within(k-1) - Within(k)}$$

with $Within(k)$ the within inertia obtained from k clusters. Husson et al. (2010) recommend a $kmin$ equal to 3 and a $kmax$ equal to 10, as a significant and large decrease in within inertia is observed between $k = 1$ and $k = 2$.

A distance measurement and a linkage rule have to be specified for the HAC to determine respectively the similarity between two given countries and the distance between clusters. As generally used in HACs, the Euclidean distance is utilized to measure dissimilarities between countries. In addition, Ward's method minimizes intra-cluster variance (or maximizes the inter-group distance), and permits to determine the hierarchy amongst clusters.

To classify the countries according to their export baskets, we use a one-digit disaggregation of the exports (i.e. 10 variables) as it is recommended that the number of variables should not be greater than the number of individuals. We retain between 5 factors that explain 72% of the variance.

For each industry, we carry out to mean tests that allow us to determine if the mean for a given cluster is equal to the overall mean. According to Lê et al. (2008), the test statistic follows a Student's distribution and can be written as follows:

$$t = \frac{\overline{x}_q - \overline{x}}{\sqrt{\frac{s^2}{n_q}\left(\frac{N-n_q}{N-1}\right)}} \sim T(N-1)$$

where $\overline{x}_q$, $\overline{x}$ and s are the average of the variable x for the given cluster q, the overall average of the variable x and the standard deviation associated to the variable x (for the whole sample) respectively. N is the total number of countries in our sample and n_q the number

of countries included in the cluster q.

The classification of the countries is reported in Table 7, while some descriptive statistics can be found in Table 8. The classification based on export shares in 1995 shows, in Table 8, that countries in Clusters 4 and 5 export manufactured products; while the countries in the Cluster 1 are more agriculture-oriented economies. On average, crude exports represent the largest share of total exports (more than 20%). Nevertheless, countries in Cluster 2 export particularly this kind of products, while for the other countries, exports of Product 3 remains secondary.

4 Results

In this section, we present our results in five(?) main subsections. In all specifications we have dropped countries that have not signed at least one FTA.

4.1 Baseline Results

In Table 1, we present our baseline results. We take the potentially naïve assumption that the decision to sign an EIA is completely independent of the decision to sign an FTA and run a Probit model in which the choice variable is whether to sign an EIA or not. For comparison, we also include corresponding specifications where the choice variable is whether to sign an FTA or not. All of our independent variables are taken from the year 1995 and our dependent variable represents all agreements signed between 1996 and 2012. At the bottom of each table we report the percentage of country pairs that our model predicts to sign an agreement that actually do (Predict sign) and the percentage of country pairs that our model predicts not to sign and agreement that do not (Predict no sign).

Our first two specifications in Table 1 correspond to the main specification in B-B. The first thing to notice is that the coefficient for *Remote* is negative and significant for signing an FTA (specification 2), which contradicts both the theory and the results of B-B. This result

is robust throughout our specifications and stems from two main reasons. The first reason is that the agreements used in B-B are all signed before 1996 which are almost all dropped from our specifications since our data come from 1995. This is an important omission since *Remote* is a time invariant variable. If a reasonably large proportion of "remote" country pairs have already signed an agreement then by construction, the majority of remaining agreements will come from "non-remote" country pairs. Note, however that this is not an issue for the EIA as only four agreements (ANZERTA, NAFTA, Colombia-Mexico, and Costa Rica-Mexico) were signed before 1996. The second reason the relative set of remote country pairs is smaller in our data set is that we aggregate countries that have entered into a customs union. Another discrepancy with our specification (2) and B-B is the negative and significant coefficient on the differences in capital-labor ratios. However, this does not contradict the typical theory as B-B predicted a quadratic relationship and we could be on the other side of the parabola.[13] With regard to signing an EIA, in addition to the magnitudes being different *Remote* and $DRGDP$ are insignificant. Both specifications are not great at predicting signatures though the model for an FTA does better.

Perhaps it is more appropriate to be concerned with the differences in the ratio of skill to unskilled labor when considering an EIA. Therefore, we drop DKL and $DROWKL$ and include $DSKUSK$ and $DROWSK$ for our next four specifications. With the exception of *Remote* which becomes slightly significant, the coefficients that are present in all six specifications in Table 1 are robust. Similarly to DKL, our results suggest that large difference in terms of skilled-unskilled labor endowment leads to high trade diversion towards the rest of the world and at the expense of the trade with the other signatory. In our last two specification of Table 1, we include our export basket similarity measure which is positive and significant for signing an EIA, but is insignificant for an FTA. Insofar as the variable $ExportBasket^{1d}$ is significant, it means that the content of the trade also matters. More similar they are, more the countries are inclined to expand/diversify their coverage of the

[13] As in B-B, the coefficient on the square of capital-labor differences is insignificant.

negotiations. This is completely plausible that countries negotiate on services as a bargaining tool. For further research, it would be interesting to account for the depth of FTAs to be able to test whether or not liberalizing services represents such a tool for signatories.

This last specification performs fairly well in correctly predicting signatures and non-signatures.

We include a variable for incorporating the State Fragility Index in all of our specifications. The coefficient for *Polity* is positive and significant for all specifications and though we lose some observations, our predictive performance is generally better than that of Table 1. Thus, countries tend to select politically stable partners. This stability may be particularly important for the enforcement of EIAs as negotiations on services do not deal with observable tariff cuts but with market access for foreign suppliers.[14]

We began this subsection stating that we are making a "potentially naïve" assumption that the decision to sign an EIA is completely independent of the decision to sign an FTA. On the one hand, this is not very far fetched as there is no formal requirement that links the two decisions. Two countries (or groups of countries) can legally sign an EIA without an FTA and they have certainly signed FTAs without having an EIA. However, what is done in practice (according to the data) is that an EIA is not signed unless and FTA is also or has been signed. We account for possible interdependence in the next three subsections.

4.2 FTA as a Prerequisite

As mentioned, there is no legal requirement to sign an FTA before signing an EIA, yet this is prevalent in the data (or at least signed simultaneously). This seems reasonable as there is a fixed cost to learn how to negotiate and build relationships with different countries. Moreover, since goods trade has historically and still is the bulk of trade value, it makes sense that countries would start with an FTA. Therefore, we ask the question; Given that two countries have an FTA, what are the characteristics that would make them more likely to

[14] When we run all the specifications without including the variable *Polity*, we obtain very similar results with the exception of $DROWSK$, which becomes insignificant for signing an FTA.

sign an EIA? We present our result for this question in Table 2. This subsample is of course smaller than our previous specifications, however our results are robust with the exception of our *Natural* variable and our GDP measures. If we focus on specification (1) which is our best in terms of overall prediction, we have two coefficients that change sign, *Natural* and *RGDP*. However, *RDGP* is not significant when we control for other variables.

4.3 Seemingly Unrelated

Though informative, it is not clear that reducing the sample and focusing only on the country pairs that have already signed an FTA is the best approach. Therefore, we next consider the situation in which the decisions to sign either an EIA or FTA are separate but we allow for the possibility that the errors of the two decisions are correlated. In Table 3, we present the results of a Bivariate Probit. The results are very similar and in some cases nearly identical to our baseline results in Table 1. As the test that ρ equal to zero is rejected, we can conclude that the decision to sign a FTA and the decision to sign an EIA are interrelated in all specifications. Thus, it is appropriate to be interested in the joint probabilities rather than both probabilities independently.[15]

We find that the economic determinants of an EIA are similar but different than that of an FTA.

4.4 Agreement composition

We focus now on the partner characteristics in more details. In Table 4, we distinguish countries according to their incomes into two groups: developing countries and developed countries.[16] We run a Bivariate Probit when one country is in the developing countries group and the other is a developed country and another one when both countries are developing

[15] We also run an ordered probit in which the outcome is zero if no agreemment is signed, one if the two countries sign a FTA and two if both FTA and EIA are signed. We obtain results in line with the tendancy we observe in Table 3, except for the variable *Remote* which turns significant in all specifications. Results are available upon request.

[16] We use the Word Bank's income categories (low, middle and high income) to do so.

countries. Note that we cannot present the results of a Bivariate Probit for trade agreement signed between two developed countries, as we have too few observations (around 290); almost all variables turn unsignificant and the $Pseudo - R^2$ is very low. Our results indicate that trade agreement signatures between developing and developed countries depend on political stability, economic sizes as well as difference in terms of income. Nevertheless, the *Polity* variable is no longer significant when both partners are developing countries, highlighting the importance for geographical variable (the coefficient of $Natural$ is large and highly signifcant). Although $RGDP$ is positive and significant, the differences in economic sizes and in capital-labor ratios are not significant when a FTA and an EIA are negotiated. Developing countries tend to favor neighbored trading partners.

In Table 5, the results of a Multinomial logit are displayed. The dependent variable is the RTA composition, equal to zero if there is no agreement, equal to one if the agreement is bilateral (two single countries), equal to two if one party is a bloc of countries such as European Union, and equal to three if the agreement is plurilateral (at least three countries, but none party is a bloc). To do so, we use data from 2000.[17] Since $Natural$ is not significant for all types of RTA composition, it means that, after 2000, countries select trading partners located in the same region when the agreement is plurilateral, and one Party is a bloc of countries. Indeed, the European Union negotiates relatively more with neighboring countries such as Croatia or Turkey among others. Nevertheless, concerning bilateral agreement, geography matters less. Interestingly, the economic size of the trading partners, $RGDP$, is positive and significant in the case of bilateral agreements but not significant in the case of plurilateral agreements. The motivation to liberalize trade with several partners goes beyond two-sided interests. Similarly, to be an exporter in the same industry helps to negotiate plurilateral agreement but has no impact on the signature of bilateral trade agreements, indicating that motivations differ from one type of RTA to another.

[17] Note that we use, for all variables, exactly the same data sources as mentioned on Section Data for 1995 and for 2000.

All the tables we present in this paper are available on request using data from 2000. We choose to present only one year for brevity as results resemble closely using data from 1995 with those using data from 2000.

For the other variables, we do not observe significant differences compare with the previous tables.

5 Concluding remarks

It is common for the empirical Trade literature to only focus on the determinants of trade agreements in goods. However, over the past decade, trade in services and consequently trade agreements in services have become increasingly important. We take the differences in trade in goods and services seriously and investigate if these differences translates into differing economic determinants. Though we expect and find similarities, we also find differences and thus motivation for more research.

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Figure 1: Economic Integration Agreements bowl

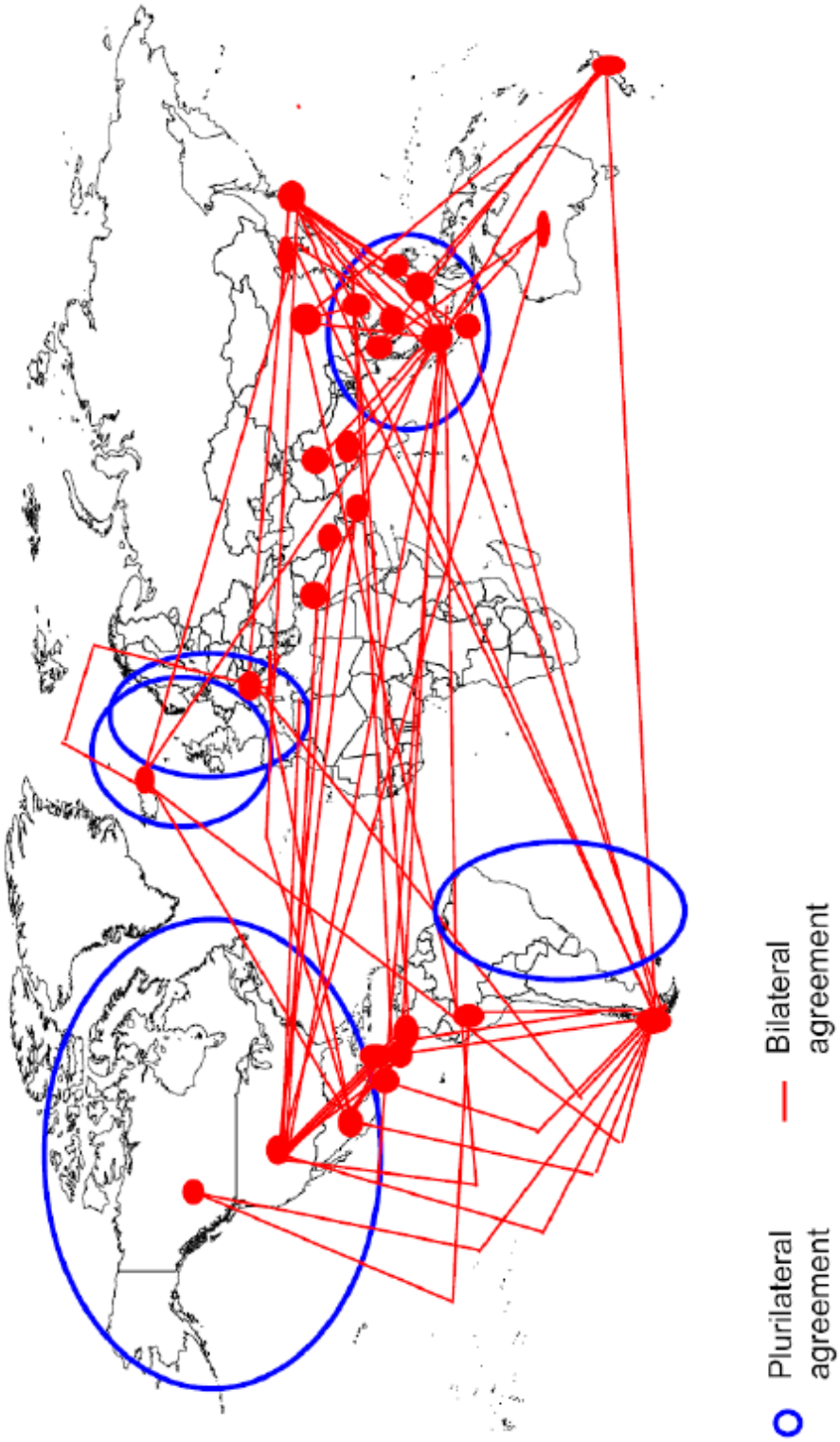

Figure 2: Total Number of Trade Agreements

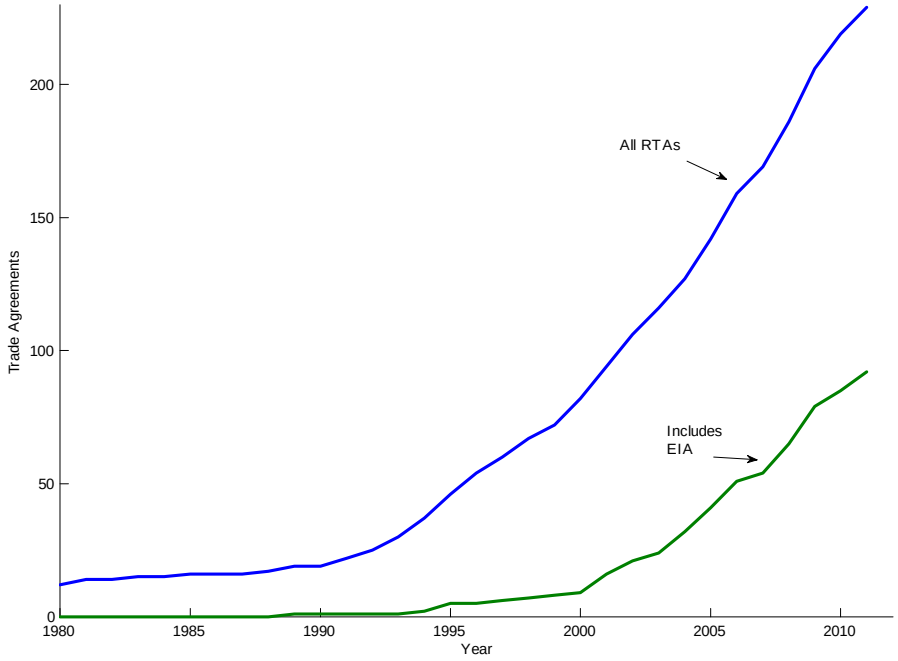

Figure 3: Share of Trade Agreements signed that include Services

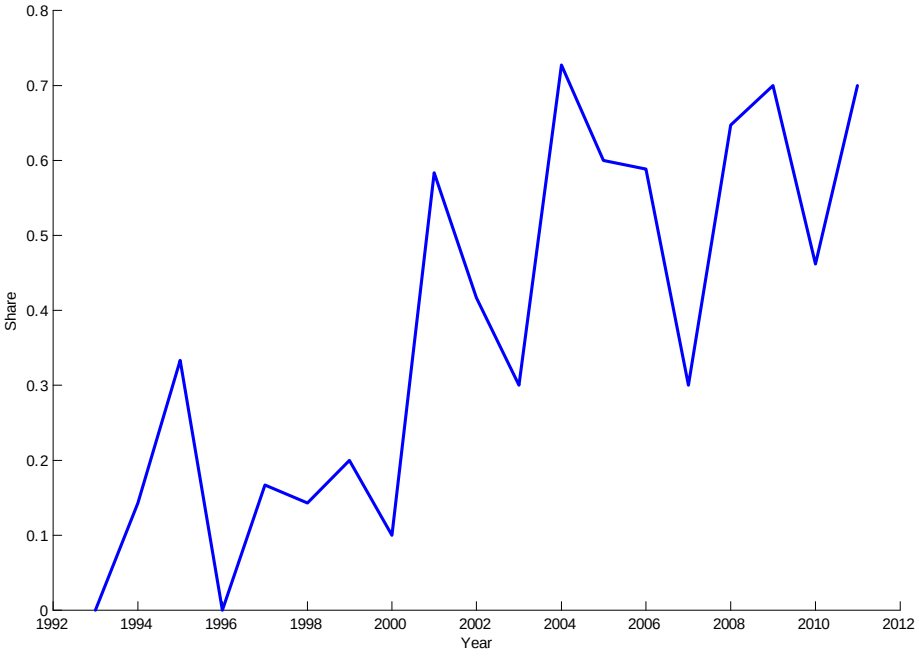

Table 1: Probit – Baseline

	(1) EIA	(2) FTA	(3) EIA	(4) FTA	(5) EIA	(6) FTA	(7) EIA	(8) FTA
Natural	0.405***	0.865***	0.299***	0.980***	0.345***	0.939***	0.386***	1.101***
	(0.039)	(0.049)	(0.053)	(0.059)	(0.040)	(0.044)	(0.055)	(0.076)
Remote	0.010	-0.029***	0.019*	-0.024**	0.018**	-0.035***	0.027**	-0.058***
	(0.008)	(0.008)	(0.011)	(0.009)	(0.008)	(0.007)	(0.012)	(0.013)
RGDP	0.022**	0.075***	0.101***	0.109***	0.062***	0.088***	0.073***	0.111***
	(0.010)	(0.009)	(0.015)	(0.012)	(0.014)	(0.011)	(0.018)	(0.016)
DRGDP	-0.010	-0.057***	-0.035	-0.096***	-0.034	-0.093***	-0.049	-0.113***
	(0.016)	(0.015)	(0.024)	(0.020)	(0.023)	(0.019)	(0.031)	(0.026)
DKL	-0.148***	-0.142***	-0.109**	-0.091**				
	(0.038)	(0.027)	(0.048)	(0.031)				
DROWKL	-6.268***	-3.387***	-4.091***	-2.616***				
	(0.370)	(0.308)	(0.463)	(0.385)				
DSKUSK					-0.165***	-0.064**	-0.210***	-0.137**
					(0.040)	(0.029)	(0.059)	(0.045)
DROWSKUSK					0.091***	0.026	0.103***	0.038
					(0.022)	(0.023)	(0.027)	(0.026)
ExportBasket^{1d}							0.271**	-0.005
							(0.091)	(0.088)
Polity			0.085***	0.070***	0.108***	0.074***	0.089***	0.061***
			(0.014)	(0.014)	(0.010)	(0.010)	(0.013)	(0.013)
Observations	7744	7398	5458	5219	5777	5631	2343	2280
Pseudo R^2	0.23	0.27	0.25	0.32	0.18	0.26	0.22	0.29
Predict sign	0.29	0.60	0.29	0.63	0.71	0.69	0.75	0.73
Predict no sign	0.96	0.94	0.97	0.94	0.96	0.92	0.93	0.90
Total Correct	0.96	0.94	0.97	0.93	0.96	0.91	0.93	0.89

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$. Independent variables taken from 1995.

Table 2: Probit for an EIA given an FTA

	(1) EIA	(2) EIA	(3) EIA	(4) EIA
Natural	-0.404***	-0.480***	-0.560***	-0.439***
	(0.069)	(0.069)	(0.096)	(0.104)
Remote	0.047**	0.047**	0.070***	0.081***
	(0.017)	(0.015)	(0.019)	(0.021)
RGDP	-0.051**	-0.026	-0.030	0.012
	(0.016)	(0.022)	(0.027)	(0.033)
DRGDP	0.121***	0.078**	0.070	0.049
	(0.032)	(0.035)	(0.049)	(0.064)
DKL	-0.123*			
	(0.066)			
DROWKL	-9.105***			
	(0.690)			
DSKUSK		-0.320***	-0.367***	-0.231**
		(0.060)	(0.105)	(0.112)
DROWSKUSK		0.432	0.276*	0.230*
		(0.290)	(0.143)	(0.133)
ExportBasket^{1d}			0.903***	0.653***
			(0.154)	(0.163)
Polity				0.125***
				(0.028)
Constant	10.038***	-3.629***	-4.186***	-5.070***
	(1.165)	(0.793)	(1.059)	(1.211)
Observations	846	805	446	399
Pseudo R^2	0.35	0.14	0.20	0.23
Predict sign	0.71	0.69	0.70	0.77
Predict no sign	0.84	0.72	0.72	0.76
Total Correct	0.79	0.71	0.71	0.76

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.
Independent variables taken from 1995.

Table 3: Bivariate Probit

	(1)		(2)		(3)		(4)	
	EIA	FTA	EIA	FTA	EIA	FTA	EIA	FTA
Natural	0.334***	0.842***	0.392***	0.880***	0.463***	1.001***	0.512***	1.105***
	(0.047)	(0.040)	(0.040)	(0.036)	(0.056)	(0.055)	(0.062)	(0.062)
Remote	-0.002	-0.022**	0.004	-0.030***	0.002	-0.052***	0.009	-0.048***
	(0.010)	(0.008)	(0.008)	(0.007)	(0.012)	(0.011)	(0.013)	(0.012)
RGDP	0.067***	0.081***	0.047***	0.073***	0.041**	0.088***	0.066***	0.109***
	(0.009)	(0.008)	(0.011)	(0.010)	(0.015)	(0.013)	(0.019)	(0.016)
DRGDP	-0.014	-0.059***	-0.028*	-0.059***	-0.048*	-0.076***	-0.071**	-0.110***
	(0.015)	(0.014)	(0.017)	(0.016)	(0.025)	(0.023)	(0.032)	(0.028)
DKL	-0.201***	-0.130***						
	(0.036)	(0.027)						
DROWKL	-4.612***	-3.322***						
	(0.348)	(0.321)						
DSKUSK			-0.233***	-0.125***	-0.335***	-0.215***	-0.234***	-0.128**
			(0.032)	(0.026)	(0.053)	(0.042)	(0.059)	(0.047)
DROWSKUSK			0.121***	0.051**	0.143***	0.062**	0.118***	0.039
			(0.021)	(0.020)	(0.027)	(0.026)	(0.029)	(0.028)
ExportBasket^{1d}					0.327***	0.112	0.272**	0.090
					(0.087)	(0.082)	(0.098)	(0.091)
Polity							0.068***	0.067***
							(0.015)	(0.014)
ρ	1.000		1.000		1.000		1.000	
Likelihood-ratio test of $\rho = 0$	1191.7		1427.5		786		595.7	
Observations	7398		6616		2704		2280	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$. Independent variables taken from 1995.

Table 4: Interdependent decisions: North/South and South/South agreements

	Developing/Developed countries		Developing/Developing countries	
	1995		1995	
	FTA	EIA	FTA	EIA
Natural	0.671***	0.187**	1.118***	0.418***
	(0.08)	(0.09)	(0.07)	(0.08)
Remote	-0.009	0.024	-0.022*	0.030
	(0.02)	(0.02)	(0.01)	(0.02)
RGDP	0.118***	0.127***	0.085***	0.080***
	(0.02)	(0.02)	(0.02)	(0.03)
DRGDP	-0.082***	-0.070**	-0.120***	-0.028
	(0.03)	(0.03)	(0.03)	(0.05)
DKL	-0.286*	-0.380**	-0.139	0.259
	(0.15)	(0.16)	(0.14)	(0.41)
DROWKL	-0.077	0.569	-2.199***	-5.202***
	(1.17)	(1.36)	(0.54)	(1.27)
SQKL	0.007	0.025	0.013	-0.335
	(0.04)	(0.04)	(0.04)	(0.22)
Polity	0.044***	0.071***	0.028	0.050
	(0.02)	(0.02)	(0.03)	(0.03)
Log likelihood		-493		-530
ρ		1.000		1.000
Likelihood-ratio test of $\rho = 0$		356***		253***
Observations		1458		3959

Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

European Union is composed of 15 countries in 1995 and 2000.

Table 5: RTA composition: Multinomial logit

	2000								
	Bilateral	Bloc	Plurilateral	Bilateral	Bloc	Plurilateral	Bilateral	Bloc	Plurilateral
Natural	0.144	0.681***	1.035***	-0.061	0.877***	1.263***	-0.020	0.940***	1.183***
	(0.24)	(0.22)	(0.15)	(0.26)	(0.16)	(0.12)	(0.26)	(0.14)	(0.12)
Remote	0.121***	0.013	-0.064*	0.145***	0.015	0.001	0.122***	0.052	0.005
	(0.04)	(0.05)	(0.02)	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)
RGDP	0.368***	0.253***	0.016	0.389***	0.236***	-0.091*	0.464***	0.162***	-0.043
	(0.06)	(0.07)	(0.05)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
DRGDP	-0.002	-0.209*	0.004	-0.069	-0.107	-0.062	-0.032	-0.067	0.036
	(0.08)	(0.11)	(0.08)	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)
DKL	0.878	-0.323	-0.713*						
	(0.56)	(0.53)	(0.40)						
DROWKL	-8.948***	-8.814***	-6.812***						
	(2.32)	(2.85)	(1.90)						
SQKL	-0.338*	0.023	0.066						
	(0.04)	(0.16)	(0.12)						
DSKUK				-0.396**	-0.559***	-0.329**			
				(0.19)	(0.19)	(0.13)			
DROWSKUK				0.106***	-0.076	0.171***			
				(0.04)	(0.10)	(0.04)			
$ExportBasket^{1d}$							-0.196	0.706***	0.738***
							(0.33)	(0.24)	(0.21)
Polity	0.057	0.221***	0.242***	0.128**	0.296***	0.240***	0.163***	0.329***	0.282***
	(0.06)	(0.06)	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)
Pseudo R^2		0.2187			0.1966			0.1912	
Log likelihood		-713			-985			-1049	
Observations		5822			5707			6293	

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The base outcome is neither FTA nor EIA. European Union is composed of 15 countries in 2000.

A Clustering Appendix

Table 6: Export baskets composition

Name	Description
Product 1	Food and live animals
Product 2	Beverages and tobacco
Product 3	Crude materials, inedible, except fuels
Product 4	Mineral fuels, lubricants and related materials
Product 5	Animal and vegetable oils and fats
Product 6	Chemicals
Product 7	Manufactured goods classified chiefly by material
Product 8	Machinery and transport equipment
Product 9	Miscellaneous manufactured articles
Product 10	Other commodities and transactions

Source: COMTRADE.

Table 7: 1995 Cluster composition at 1-digit

Cluster 1: ARG, BLZ, CIV, COL, COM, CRI, DMA, ECU, ETH, GLP, GMB, GRD, GRL, GTM, HND, JOR, KIR, KNA, LCA, MAR, MDG, MDV, MOZ, MTQ, NIC, NZL, PAN, REU, SDN, SLV, UGA, URY, VCT
Cluster 2: BMU, COG, CYP, DZA, GIN, MDA, MWI, NER, OMN, SAU, SUR, SYC, TTO, VEN
Cluster 3: AUS, BDI, BFA, BOL, BRA, CAF, CHL, CMR, EGY, IND, KAZ, KGZ, MKD, PER, PRY, TGO, ZAF, ZMB, ZWE
Cluster 4: BGD, HTI, MAC, MUS, TUN, TUR
Cluster 5: AND, BLX, CAN, CHN, CZE, EFTA, EST, EU15, GUF, HKG, HRV, HUN, IDN, ISR, JPN, KOR, LTU, LVA, MEX, MLT, MYS, POL, ROM, SGP, SVK, SVN, THA, USA

Table 8: Descriptive statistics by clusters for the year 1995

Cluster		Prod. 1	Prod. 2	Prod. 3	Prod. 4	Prod. 5	Prod. 6	Prod. 7	Prod. 8	Prod. 9	Prod. 10
1	mean	0.4232	0.1897	0.0960	0.0622	0.0533	0.0375	0.0397	0.0308	0.0647	0.0124
	t-stat	7.4696	4.5889	-3.2923	1.2854	-0.9137	-1.1180	-2.1442	-3.6812	-3.2586	-3.3890
		(0.000)	(0.000)	(0.001)	(0.202)	(0.363)	(0.266)	(0.035)	(0.000)	(0.002)	(0.001)
2	mean	0.0673	0.0571	0.7345	0.0181	0.0177	0.0142	0.0192	0.0430	0.0404	0.0083
	t-stat	-2.2228	-1.1815	8.5069	-2.0253	-2.9704	-1.8182	-1.8654	-1.7480	-2.4438	-2.5050
		(0.029)	(0.240)	(0.000)	(0.046)	(0.004)	(0.072)	(0.065)	(0.084)	(0.016)	(0.014)
3	mean	0.1050	0.0684	0.2334	0.0230	0.0635	0.1180	0.0383	0.2701	0.0701	0.0107
	t-stat	-1.8400	-1.0280	0.4149	-2.0626	0.2169	4.1031	-1.5324	6.1255	-2.0967	-2.6240
		(0.069)	(0.306)	(0.679)	(0.042)	(0.829)	(0.000)	(0.129)	(0.000)	(0.039)	(0.010)
4	mean	0.0947	0.0709	0.0554	0.0384	0.0426	0.0611	0.5103	0.0379	0.0570	0.0318
	t-stat	-1.0777	-0.4914	-1.5988	-0.4726	-0.7910	0.3421	8.2926	-1.1905	-1.2862	0.3983
		(0.284)	(0.624)	(0.113)	(0.638)	(0.431)	(0.733)	(0.000)	(0.237)	(0.201)	(0.691)
5	mean	0.0456	0.0353	0.1072	0.0726	0.0916	0.0328	0.0897	0.1092	0.3540	0.0620
	t-stat	-4.0500	-2.8000	-2.6433	2.1593	3.2593	-1.3613	0.4688	0.3871	7.5750	7.2312
		(0.000)	(0.006)	(0.010)	(0.033)	(0.002)	(0.177)	(0.640)	(0.699)	(0.000)	(0.000)
All	mean	0.1887	0.0981	0.2122	0.0504	0.0609	0.0503	0.0798	0.1009	0.1447	0.0270
	Std	0.2192	0.1393	0.2465	0.0640	0.0584	0.0796	0.1305	0.1331	0.1714	0.0300
	Min	0.0013	0.0003	0.0005	0.0001	0.0001	0.0000	0.0000	0.0004	0.0000	0.0000
	Max	0.8314	0.741	0.9939	0.4326	0.2987	0.5745	0.7216	0.8569	0.7126	0.1436

P-values are reported in parentheses. t-stat corresponds to the mean test statistic.