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Transport Costs and Trade. Empirical Evidence for Latin American Imports from the European Union

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Transport Costs and Trade.
Empirical Evidence for Latinoamerican Imports from the European Union

by

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Abstract

This paper aims to investigate the relationship between trade and transport costs. In previous studies the cost of transport was considered as an exogenous variable. However, an expanding volume of trade also reduces the unit cost of transport and therefore, the causal relationship between trade and transport costs may be operating in both directions. A transport-costs equation is estimated using data on transportation costs from the International Transport Data Base (BTI). The relationship between transport costs and trade is then analysed by applying a gravity model for sectoral imports for five South-American Countries from the European Union. We investigate the endogeneity of the trade and transport cost variables by estimating simultaneously both equations. Our results show that, while higher distance and poor importer's infrastructure notably increase transport costs, a higher volume of trade have the opposite effect, lowering transport costs. Moreover, trade is significantly deterred by higher transport costs and fostered by cultural similarities.

Key words: transport costs; infrastructure; imports sectors

JEL classifications: F14

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1. Aims

In this paper, we aim to evaluate the relative importance of different sources of trade costs, namely, freight rates, economies of scale, poor infrastructure and location facilities, in Latin-American imports from the European Union (EU). Recent liberalisation processes in Latin America have reduced both tariff and non-tariff barriers considerably. In 1997, Latin America had an average tariff of 8.4 percent for imports from the EU, considerably lower than the 34 percent average of 1986[1]. This reduction in artificial trade barriers has implied that transport costs have become an increasingly important determinant of trade. In 1998, the average freight rate for Mercosur imports from the EU was 15 percent[2]. Therefore, any additional effort to integrate a country into the trading system has to consider transport costs.

In most cases we have no direct way of observing trade barriers, and therefore we have to rely on proxies, indirect measurement and trade modelling in order to assess their relevance. Hummels (1999) made a significant contribution to the literature by showing clear evidence of the importance of trade costs. His results suggest that, to some extent, import choices are made in order to minimise transportation costs.

In our research we introduce two significant novelties. First, we use disaggregated data on freight rates. Rauch (1999) emphasised that transport costs depend upon the type of product traded. He showed that search costs are higher for trade in differentiated products. When aggregated data are used and the composition of trade is not considered, the effect of transport costs –in terms of distance - in trade patterns can be misleading. To our knowledge, only a few authors have considered disaggregated data, but with different purposes (Hummels, 1999; Rauch, 1999).

We investigate the endogeneity of the transport cost variable by estimating simultaneously the trade and transport cost equations as stated in Kumar and Hoffmann (2002):

> ″What appears to be missing in the reviewed literature is a more thorough consideration of the mutual relationship between trade volumes, transport costs and the quality of transport services."

[1] Source: IMF data
[2] Source: Data Base for International Transport (BTI).

We, therefore, specify an augmented trade cost equation that adds infrastructure, port efficiency and economies of scale as explanatory variables. We made use of an infrastructure index constructed in a similar way to that of Limao and Venables (2001) and also of data on port efficiency from the Global Competitiveness Report. We apply a gravity model to bilateral trade flows between Latin American countries and the European Union in order to investigate to what extent transport costs are an important determinant of imports and to evaluate the trade composition effect.

Section two presents a discussion on the relevant issues with emphasis on the importance of international trade costs for international trade. Section three discusses the different methods used in the recent literature to measure transportation costs. In section four, a transport cost equation is estimated by using sectoral data. Section five presents a variant of the standard gravity model of trade. Section six discusses the results of the empirical application and concludes.

2. The cost of moving goods across countries

A common practice in the literature related to gravity equations has been to proxy transport costs with the geographical distance between countries. It has been shown that distance seems to be a good proxy for transport costs at aggregate level. However it is not clear that this good performance remains at more detailed levels (Hummels,1999). Venables (2001) classifies the costs of distance into four types. First, the cost of moving goods internationally (direct shipping costs). Second, searching costs (the cost of identifying potential trading partners). Third, control and management costs and finally, the cost of time involved in shipping goods. Hence, when distance is added as a regressor in gravity models of trade, it is far from clear how the magnitude of the estimated coefficient should be interpreted.

Most research situates the elasticity of aggregated trade flows with respect to distance in the interval (-0.5, -1.5)[3]. This shows a major decrease in trade volumes caused by higher distances. A growing interest has recently been shown in the study of the "new economics of distance". Researchers argue that most distance-related costs tend to decrease with the continuous development of new technologies.

[3] Coe *et al*. (2002) report a summary of estimates of distance coefficients obtained recently by different authors (page 5).

However, the empirical literature on gravity models shows that the estimated coefficients on distance have been remarkably stable over time. An exception is Coe *et al.* (2002). In their non-linear specification of the gravity model the coefficient estimates of distance clearly decline over time.

Does information technology mark the end of the importance of distance? The answer to this question is not straightforward. The cost of moving materials using different modes has changed at different rates across categories without always showing the expected decrease over time. Only the cost of moving information has steadily declined (92% between 1960-1998[4]), but the cost of moving goods has not declined continuously; the cost of sea transport declined during the 1940's and 1950's but, since then, there has been no clear declining trend, Hummels (2001).

Rauch (1999) identified some of the non-conventional cost of trade associated with search for the case of different types of goods. He claimed that these informational costs fall relatively on differentiated goods. He focussed on the effects of distance and common language/colonial ties in trade of three types of goods: those traded on organised exchanges, those possessing reference prices and all other commodities. The author presented evidence that shows that proximity and common language/colonial ties are more important for differentiated products than for products traded on organised exchanges in matching international buyers and sellers.

Hummels (1999) classified the trade costs implied by trade flows into three different categories: explicit measured costs, given by tariffs and freight rates; costs associated with common proxy variables such as distance, sharing a language, sharing a border or being and island, and implied but unmeasured trade costs, given by geographical position, cultural ties or political stability. His results indicated that explicit measured costs were the most important component. He offered alternative explanations for the costs associated with distance and adjacency effects based on direct trade barriers, on endogenous production responses and on preferences. However, the regression results do not allow the possibility of disentangling elements related to the various interpretations.

Hummels (1999) finds that adjacency and distance effects were rarely relevant when interpreted directly as trade barriers. However, when interpreted as price premia, these effects were important in approximately 75% of the products.

[4] Ward and Huang (1999)

Moreover, the author gives a tentative interpretation of the residuals of the import demand equations in terms of the willingness to pay for preferred varieties, assuming that they are unmeasured trade costs. As he points out, this interpretation implies that the estimation suffers from omitted variables and also from the biases these variables may induce in the estimated coefficients. Hummels concludes that freight rates at disaggregated level are higher than aggregated rates and vary considerably among exporters and among products, which suggests that import choices are made in order to minimise transport costs. He also claimed that the channels through which trade barriers affect trade volumes remain unclear and are a subject for further research. Finally, he offers a complete characterisation of the trade costs implied by trade flows, by establishing a fresh classification of those costs into the three components mentioned above.

Following Hummels' approach, in the next section we focus on the measurement of transport costs. The section gives also an analysis of the data used in this paper.

3. Measurement of transport costs

One of the main difficulties in analysing transport costs is that of obtaining reliable data. In the recent economic literature there have been several attempts to measure directly or indirectly transport costs. Some authors used cif/fob[5] ratios as a proxy for shipping costs (Baier and Bergstrand, 2001, Limao and Venables, 2001; Radelet and Sachs, 1998). Since most importing countries report trade flows inclusive of freight and insurance (cif) and exporting countries report trade flows exclusive of freight and insurance (fob), transport costs can be calculated as the difference of both flows for the same aggregate trade. However, Hummels (2001) showed that importer cif/fob ratios constructed from IMF sources are poor proxies for cross-sectional variation in transport costs and such a variable provides no information about the time series variation. Ogueldo and Mcphee (1994) also doubted the usefulness of cif/fob ratios from IMF sources as a proxy of transportation costs.

Hummels (1999 and 2001) used data on transport costs from various primary sources including shipping price indices obtained from shipping trade journals

[5] Cif stands for "cost, insurance and freight"; fob stands for "free on board."

(Appendix 2 in Hummels, 2001); air freight prices gathered from survey data; and freight rates (freight expenditures on imports) collected by customs agencies in United States, New Zealand and five Latin-American countries (Mercosur plus Chile).

In addition to cif/fob ratios reported by the IMF, Limao and Venables (2001) used shipping company quotes for the cost of transporting a standard container (40 feet) from Baltimore to sixty-four destinations. The authors pointed out that it is not clear how the experience of Baltimore can be generalised. Martínez-Zarzoso, García-Menendez, and Suárez-Burguet (2003) used data on transportation costs obtained from interviews with logistic operators in Spain. They found import elasticities with respect to transport costs similar in magnitude to those found by Limao and Venables (2001).

Micco and Perez (2001) used data from the U.S Import Waterborne Databank (U.S: Department of Transportation), where transport cost is defined as "the aggregate cost of all freight, insurance and other charges (excluding U.S. import duties) incurred in bringing the merchandise from the port of exportation to the first port of entry in the U.S.". Sanchez, Hoffmann and Micco (2002) analysed data on maritime transport costs obtained from the International Transport Data Base (BTI). They focussed on Latin American trade with NAFTA.

Among the diverse sources mentioned above for transport cost data, one of the most extensive is the "US Imports of Merchandise" from the US Census Bureau, used by Hummels (1999) and Micco and Perez (2001). These data report highly detailed custom information on US imports from all exporting countries since 1974. Data contain freight rates with loading and unloading expenses included. Unfortunately, we do not find similar information for other countries.

The above-mentioned research shows that the common perception that transport costs are unimportant is wrong, they are neither small nor uniform across goods. In the empirical application of this paper we aim to add further evidence concerning the importance of transport costs. In order to do so, we use cif/fob ratios obtained from the BTI[6]. Data from the BTI for freight rates are exclusive of loading costs. The main difference between these ratios and those reported by the IMF is that the BTI data on imports at cif prices and imports at fob prices are obtained from the same reporting country. Since information is collected using identical methodology,

[6] Data were provided by Jan Hoffmann (ECLA).

the data are more reliable than the IMF rates. A second advantage is that we have disaggregated data at 3 digit level SITC. We use the same source as Sanchez, Hoffmann and Micco (2002) but for different trade flows. Our data are also similar to those used by Hummels (1999) collected by custom agencies in five Latin-American countries (Argentina, Brazil, Chile, Paraguay) in 1992 and 1994. The main differences between both data-sets are the period and the set of exporters. We have data for the year 1998, and they include imports from the EU to Argentina, Bolivia, Brazil, Chile and Uruguay (Bolivia and Uruguay are added and Paraguay excluded with respect to Hummels' work).

In line with Hummels (1999), an accurate analysis of our data is made by going down to the sectoral level. We observe a very wide variation of transport costs across products and across countries. Figure 1 shows freight rates across sectors (SITC at 1 digit level) and across importers. A great variation can be observed in both dimensions. In the sectoral dimension, freight rates for manufactures (SITC 5-8) are, in most cases, lower than freight rates for commodities. In the importer dimension, Bolivia, which is the only landlocked country among the importers, always shows the highest ad-valorem rates. Table 1 shows the average sectoral (unweighted) freight rates for imports at 2 digits SITC and Table 2 presents the average transport costs for sectors at 1 digit level in descending order. In Table 3 a comparison is made for Argentinean imports of trade-weighted and unweighted freight rates. The rates suggest that destinations with the lowest ad-valorem transport costs have the largest share of trade, since the unweighted freight rate is almost always higher than the corresponding trade-weighted freight rate. The same occurs for the other five importers.

Our data correspond to those of Hummels (1999) in that they show how transport costs might play a relevant role in allocating trade over partner countries. Table 4 shows the percentage shares of sectoral imports with respect to total imports from the EU. Imports are concentrated in the manufacturing categories (sectors 5, 6, 7 and 8 at 1-digit level SITC). Machinery & Transport Equipment show the highest share (higher that 50%) of total imports from the EU and Chemicals & Related products present a share close to 15%. Table 5 reports the15 products at 2 digit level with a highest share in total imports from the EU, the first positions are for products of group 7 (machinery and transport equipment).

Table 6 classifies imports by transportation mode. We observe that more than 50% of total imports are transported by sea. For Brazil and Chile the percentages are close to 70%. Accordingly, we suspect that port efficiency may play an important role in fostering trade.

4. What factors explain transport costs?

A general formulation of transport costs for commodity k shipped between countries i and j, in a given period of time, can be written as:

$$TC_{ijk} = F(X_i, X_j, v_{ij}, x_{ijk}, \mu_k, \eta_{ij}) \qquad (1)$$

where X_i and X_j are country specific characteristics, v_{ij} is a vector of characteristics relating the journey between i and j, x_{ijk} a vector of characteristics depending on the country of origin and destination and the type of product (k), μ_k is a product specific effect that captures differences in transport demand elasticity across goods and η_{ij} represents unobservable variables.

Among the country characteristics, X_i and X_j, we incorporate geographical and infrastructure measures. Typically, dummy variables are used to control for a country that is landlocked or an island. The infrastructure measure used is constructed as an index in which larger values indicate a better infrastructure. In the vector of characteristics, v_{ij}, distance between trading countries, volume of imports that goes through a particular route, and dummy variables for common language and common border[7], are usually considered. Among the characteristics depending also on the type of product, x_{ijk}, we focus on the weight value for product k transported from country i to country j. Product specific dummy variables are also modelled to account for μ_k.

Assuming a multiplicative form, a transport cost function can be written as:

[illegible] (2)

[7] The common border variable is not modelled since in the mutual trade UE-LA countries do not share borders. The same applies for the island dummy.

where TC_{ijk} denotes freight ad-valorem rates, i denotes the importer country, j denotes the exporter country and k is the 3-digit level of the SITC classification. W_{ijk} denotes the weight to value ratio (the inverse of the unit value: tonnes per US$), D_{ij} denotes distance, Q_{ij}, is the volume of imports between countries i and j. This variable accounts for potentials economies of scale. Inf_i and Inf_j denote infrastructure of countries i and j. $Land_i$ and $Land_j$ are dummies that take the value one when the importer or the exporter is a landlocked country, zero otherwise, $Lang_{ij}$ takes the value one when countries i and j speak a common language, zero otherwise. η_{ijk} denotes the error term that is assumed to be independently distributed. The variables Inf_i and Inf_j are first constructed as an index[8] (taking information on roads, paved roads, railroads and telephones), by differentiating between importer and exporter country infrastructure as explanatory variables of transport costs.

Our index is similar to that of Limao and Venables (2001). A rise in our index indicates better infrastructures and is expected to be associated with a decrease in the costs of transport. We also used data on port efficiency from the Global Competitiveness Report as an alternative for the infrastructure variables. This data consists of a 1 to 7 index, with 7 indicating the best score.

We estimate a linear version of equation (2). Taking natural logarithms, the general specification is given by:

(3)

Estimation results from Equation (3) are shown in Table 7.1. We tested for the significance of the explanatory variables by using several specifications in order to compare our results with those obtained previously in the literature. In Model 1, we estimated a pooled regression with only distance and weight variables. We include importer country dummies to compare our results with those obtained by Hummels (1999). The distance coefficient has the expected positive sign showing that a 10% increase in distance increases transport costs by 5.3%. Our estimated distance

[8] Infrastructure in each country is measured by an index constructed by taking the mean over four variables; km of road, km of paved road, km of rail (each one divided by the surface area of the country) and main telephone lines per person. Since these measures are highly correlated among themselves, it is not possible to identify each of their influences on transport cost separately.

elasticity is higher than that found in other studies, even when we use commodity specific distance coefficients (0.68 in Model 2). Using a very similar specification, Hummels (1999) found commodity specific distance coefficients clustered in the 0.2 to 0.3 range. Similarly, Micco and Pérez (2001) obtained a distance coefficient close to 0.2 in their transport cost equation. However, when distance specific coefficients and sectoral dummies are specified in the model, the significance level and the sign of the distance coefficient varies greatly (Model 3), but still the average coefficient is high (0.68). One reason for this disparity in results may be that trade costs associated with Latin American imports are higher than trade costs associated with USA imports.

In Model 4 a $Land_i$ and $Lang_{ij}$ were added to the basic specification. Since in our sample of exporters we do not have any landlocked country, $Land_j$ cannot be included. Both estimated coefficients are significant at conventional levels. They indicate that when the importer is a landlocked country transport costs are a 61% [exp(0.48)-1]*100 higher than when it is a coastal country. A common language reduces transport costs in a 5% [exp(-0.05)-1]*100. Infrastructure variables were added In Model 5. The importer infrastructure variable shows a statistically significant coefficient with the expected negative sign. We can interpret the importer infrastructure variable as a proxy for port infrastructure when the transport is by ship. The estimated coefficient indicates that poor infrastructure notably increases transport costs for importers: a 1% increase in infrastructure reduces transport costs by 0.29%. On the other hand, the coefficient on Inf_j shows that the reduction in transport costs induced from an improvement of 1% in the exporter infrastructure is only of 0.05%. We show that the distance coefficient remains statistically significant but with a significantly lower magnitude (0.14) when infrastructure variables were added. When port efficiency is replaced by the infrastructure index, Inf_i still gives a negative and significant coefficient, slightly higher in magnitude (-0.37), showing that an increase in port efficiency reduces transport costs for LA countries. However the coefficient on Inf_j is non significant and positive signed, may be because European ports have already reached a considerable level of port efficiency, compared to LA ports.

Models 6 and 7 show that economies of scale are also a relevant variable explaining the variation of transport costs. Model 6 presents the results obtained when import volumes are considered as an exogenous variable. The estimated elasticity is -0.10 and we observed that the distance coefficient loses significance and the infrastructure elasticities are lower than before but still significant. Since this model may suffer from endogeneity problems - lower transport costs induce more trade - we performed a new estimation considering the import volume as endogenous (Model 7). The estimated elasticity for Q_{ij} is only slightly reduced in magnitude (-0.06) and the rest of estimated parameters are very similar. This confirms the importance of economies of scale. Our estimated elasticity is only slightly higher than that reported by Micco and Pérez (2001)[9].

inally, Table 7.2 presents the results of estimating Equation (3) at 1 digit SITC level, since we suspect that there may be some heterogeneity among the estimated coefficients when aggregated over all products. In fact, we observe important differences among sectors. The weight-value ratio, landlocked dummy and importer infrastructure variables are significant at 1% level for all categories. However, the distance variable is only significant for categories 7 and 8 when infrastructure variables are added. The magnitude of the product-weight elasticity with respect to transport costs varies within the range (0.12-0.37). Categories 1, 7 and 8 show the highest elasticities. Those are sectors with higher than average unit values and therefore, air transport may be a good substitute for sea transport. Additionally, the significance and magnitude of the distance elasticity is higher for manufactured products (with the exception of category 3). Products in these categories are the most heavily exported from the EU to Latin-America.

Finally, when the landlocked country is added as a explanatory variable it shows a significant and positive coefficient within the range (0.30-0.95) which confirms the higher transport costs incurred for landlocked countries (in our case, Bolivia). Transport costs for landlocked countries is a 35% [exp(0.30)-1]-158% [exp(0.95)-1] higher than for non-landlocked countries.

5. Trade and transport costs

In order to assess the relative importance of transport costs on trade we need and appropriate theoretical framework. In recent years, the gravity model of trade has become the workhorse of international trade. From the large empirical literature, it is commonly accepted that gravity models explain well bilateral trade patterns.

[9] Micco and Perez (2001) found that using instrumental variables the economy of scale variable remained negative and highly significant, but the magnitude of the coefficient increased in absolute value (-0.042 v/s -0.025).

According to the simplest gravity model of trade, the volume of imports (exports) between pairs of countries, M_{ij}, is a function of their incomes (GDPs), their geographical distance and a set of dummies:

[illegible] (4)

where Y_i (Y_j) indicates GDPs of the exporter (importer), D_{ij} measures the distance between the two countries' capitals (or economic centres) and A_{ij} represents any other factors aiding or preventing trade between pairs of countries. u_{ij} is the error term.

rade is expected to be positively related to economic mass and negatively related to distance. The majority of estimates of the gravity equation are based on a log-linear transformation of equation (4):

[illegible] (5)

where ln denotes variables in natural logs. $\sum_h \delta_h P_{ijh}$ is a sum of preferential trade dummy variables. P_{ijh} takes the value one when a certain condition is satisfied (e.g. belonging to a trade bloc), zero otherwise. Usually models include dummy variables for trading partners sharing a common language and common border as well as trading blocs dummy variables evaluating the effects of preferential trading agreements. The coefficients of all these trade variables (δ_h) are expected to be positive.

Theoretical support of the research in this field was originally very poor, but since the second half of the 1970s several theoretical developments have appeared in support of the gravity model. Although distance is included in all empirical gravity models, the theoretical models relate trade to transport costs, for which distance is a proxy. The relationship between trade cost and distance, already specified in equation (3) above, indicates that the elasticity of trade cost with respect to distance is positive, so $\alpha_2>0$.

Starting with a theoretical model that relates bilateral trade with income and transport costs and then substituting equation (3) for transport cost, one gets an augmented gravity equation relating trade to distance and other variables:

[illegible] (6)

where

[illegible] (7)

The model is estimated for bilateral exports from twelve EU countries to five Latin American importers with data for 1998 disaggregated at 3 digits level (SITC). We performed OLS estimation on the double log specification as given by equations (6) and (7). In the standard model (Equation 5 without dummies) α_3 is a 'gross' distance elasticity of trade, while in the models augmented with infrastructure or/and dummies and once controlled for the composition of trade (sectoral dummies), the distance elasticity is a 'residual'.

Table 8.1 shows our results for aggregate trade flows. Model 1 presents the OLS results for the baseline case, which excludes infrastructure variables and dummies and $\gamma_k=\gamma$.
(there are no sectoral effects). The standard regressors are income and distance variables. The coefficients on the income variables show the expected positive sign. The income elasticity is lower for the importer income (0.68). The exporter income elasticity (1.06) indicates a high sensitivity of LA imports to the EU economic cycle. Both are significant at 1% level. In Model 2, sectoral dummies at 2 digit level are added to the list of explanatory variables. Their inclusion considerably improves the fit of the regression and the distance coefficient increases slightly in magnitude. In Model 3 we add the landlocked and language dummy variables, the estimated coefficients indicate that a landlocked country trades a 56% less than a non-landlocked country and sharing a language increases trade in a 289%. The inclusion of these dummies considerable reduces the distance coefficient (-0.24). Infrastructure variables are added in Models 4 and 5. In model 4 we used the infrastructure index similar to Limao and Venables (2001). The importer infrastructure has a positive and significant coefficient, thus showing that an improvement in the infrastructure in LA countries will foster trade, whereas the exporter infrastructure coefficient is not significant. We can observe how the distance coefficient is still significant and it shows the correct sign but a different magnitude (-0.77). In Model 5 port efficiency is

used as a proxy for port infrastructure. The fit of the equation is slightly better that in Model 4, the estimated coefficient for Liporti indicates that higher levels of efficiency in LA ports leads to an increase in imports. However, Liportj has a negative coefficient, which is significant at conventional levels. Additionally, the distance coefficient has an implausible large coefficient which is not significant.

Model 6 adds language to the list of explanatory variables, the estimated coefficient indicates that sharing a language increases mutual trade and therefore cultural similarities play an important role in international trade. In Model 7 transport cost is directly introduced in the trade equation. First, this variable is considered as exogenously determined and finally, the mutual relationship between trade and transport cost is modelled. The results point towards the importance of this mutual relationship.

Table 8.2 presents the results of estimating equation (6) at 1 digit SITC level since we suspect that there may be some heterogeneity among the estimated coefficients when aggregated over all products. In fact, important differences are observed among sectors. We can see that the fit of the regressions is better for manufactured categories (5-8) and that the significance and sign of the distance and infrastructure variables vary considerably across categories. Further research is needed at a higher level of disaggregation to evaluate the relevance of transport costs in trade for different sectors.

6. Concluding comments

The aim of this paper was to investigate the determinants of transport costs and the nature of the relationship between trade and transport costs. We estimated a transport costs equation using data on transportation costs for five Latin-American countries. We also studied the relationship between transport costs and trade and we estimated an export demand model.

The results from our first estimation show that higher distance and poor partner infrastructure notably increase transport costs. Inclusion of infrastructure measures improves the fit of the regression, corroborating the importance of infrastructure in determining transport costs. The distance coefficient remains significant and does not always decreases in magnitude when we add infrastructure.

The results from our second estimation show that - as expected - importer and exporter income variables have a positive influence in bilateral trade flows. Importer income elasticity is lower than exporter income elasticity. Being landlocked significantly deters trade while cultural similarities, such as sharing a language, foster trade. Distance does not appear to be a good proxy for transport costs in several categories.

Further estimations for other countries and years, would be of interest because they would allow us to find out more about the effects of transportation costs on trade flows under diverse conditions of international transport.

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Figure 1. Freight rates across sectors (1-digit level) and across importers (imports from the EU in 1998)

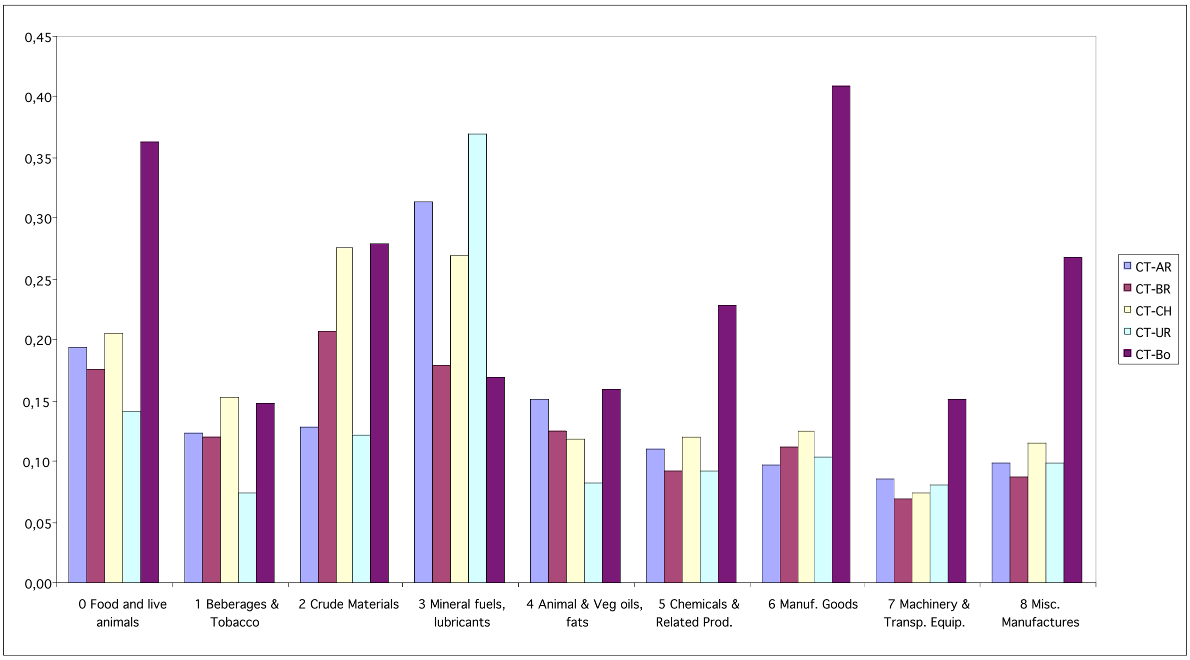

Table 1. Average sectoral freight rates for imports (CIF/FOB)-1

1998 Average Freight Rates SITC-2D:	Argentina	Brasil	Chile	Uruguay	Bolivia
0 Food and live animals	**0.19**	**0.18**	**0.21**	**0.14**	**0.36**
00 Live animals chiefly for food	0.45	0.74	0.64	0.57	0.88
01 Meat and meat preparations	0.05	0.12	0.09	0.06	0.22
02 Dairy products and birds' eggs	0.15	0.09	0.09	0.12	0.32
03 Fish, crustaceans, molluscs, preparations thereof	0.11	0.08	0.11	0.07	0.51
04 Cereals and cereal preparations	0.44	0.15	0.38	0.11	0.74
05 Vegetables and fruit	0.26	0.17	0.18	0.14	0.14
06 Sugar, sugar preparations and honey	0.08	0.16	0.18	0.10	0.24
07 Coffee, tea, cocoa, spices, manufactures thereof	0.07	0.08	0.11	0.07	0.29
08 Feeding stuff for animals, not including unmilled cereals	0.26	0.08	0.08	0.13	0.14
09 Miscellaneous edible products and preparations	0.07	0.08	0.20	0.05	0.16
1 Beverages & Tobacco	**0.12**	**0.12**	**0.15**	**0.07**	**0.15**
11 Beverages	0.15	0.11	0.13	0.09	0.21
12 Tobacco and tobacco manufactures	0.10	0.13	0.17	0.06	0.09
2 Crude Materials	**0.13**	**0.21**	**0.28**	**0.12**	**0.28**
21 Hides, skins and fur-skins, (raw)	0.04	0.11	0.07	0.03	0.20
22 Oil seeds and oleaginous fruit	0.26	0.10	0.97	0.23	0.34
23 Crude rubber (including synthetic and reclaimed)	0.12	0.17	0.09	0.10	0.10
24 Cork and wood	0.12	0.30	0.12	0.16	-
25 Pulp and waste paper	0.16	0.12	0.59	-	-
26 Textile fibres (except wool) and their wastes	0.11	0.13	0.13	0.06	0.54
27 Crude fertilisers and crude materials (excluding coal)	0.15	0.20	0.27	0.37	0.35
28 Metalliferous ores and metal scrap	0.11	0.66	0.11	0.07	0.19
29 Crude animal and vegetable materials n.e.s.	0.08	0.08	0.13	0.07	0.23
3 Mineral fuels, lubricants	**0.31**	**0.18**	**0.27**	**0.37**	**0.17**
32 Coal, coke and briquettes	0.75	0.31	0.37	0.77	-
33 Petroleum, petroleum products and related materials	0.11	0.12	0.12	0.08	0.29
34 Gas, natural and manufactured	0.08	0.10	0.32	0.26	0.05
4 Animal & Veg oils, fats	**0.15**	**0.13**	**0.12**	**0.08**	**0.16**
41 Animal oils and fats	0.21	0.14	0.15	0.09	0.19
42 Fixed vegetable oils and fats	0.10	0.09	0.09	0.03	0.15
43 Animal-vegetable oils-fats, processed, and waxes	0.14	0.15	0.12	0.12	0.15
5 Chemicals & Related Products	**0.11**	**0.09**	**0.12**	**0.09**	**0.23**
51 Organic chemicals	0.06	0.06	0.10	0.07	0.11
52 Inorganic chemicals	0.12	0.11	0.19	0.11	0.45
53 Dyeing, tanning and colouring materials	0.09	0.06	0.11	0.09	0.21

54 Medicinal and pharmaceutical products	0.04	0.03	0.04	0.06	0.13
55 Essential oils & perfume materials; toilet, polishing and cleansing preparations	0.11	0.10	0.10	0.12	0.19
56 Fertilisers, manufactured	0.25	0.14	0.19	0.10	0.51
57 Explosives and pyrotechnic products	0.08	0.12	0.12	0.09	0.34
58 Artificial resins, plastic materials, cellulose esters and ethers	0.13	0.09	0.10	0.12	0.14
59 Chemical materials and products n.e.s.	0.11	0.09	0.12	0.08	0.18
6 Manuf. Goods	**0.10**	**0.11**	**0.13**	**0.10**	**0.41**
61 Leather, leather manufactures n.e.s. and dressed fur skins	0.08	0.11	0.11	0.08	2.14
62 Rubber manufactures n.e.s.	0.09	0.09	0.11	0.09	0.27
63 Cork and wood manufactures (not furniture)	0.10	0.11	0.11	0.15	0.24
64 Paper, paperboard, articles of paper, paper-pulp/board	0.10	0.14	0.16	0.08	0.22
65 Textile yarn, fabrics, made-up articles, related products	0.08	0.11	0.10	0.10	0.23
66 Non-metallic mineral manufactures n.e.s.	0.12	0.15	0.21	0.18	0.26
67 Iron and steel	0.10	0.11	0.11	0.07	0.20
68 Non-ferrous metals	0.10	0.08	0.12	0.06	0.12
69 Manufactures of metal n.e.s.	0.11	0.10	0.09	0.11	0.21
7 Machinery & Transp. Equip.	**0.09**	**0.07**	**0.07**	**0.08**	**0.15**
71 Power generating machinery and equipment	0.08	0.07	0.07	0.06	0.19
72 Specialised machinery (specialized) for particular industries	0.07	0.06	0.07	0.10	0.15
73 Metalworking machinery	0.06	0.05	0.07	0.10	0.20
74 General industrial machinery & equipment, and parts	0.08	0.06	0.07	0.09	0.09
75 Office machines & automatic data processing equipment	0.17	0.05	0.05	0.06	0.11
76 Telecommunications & sound recording apparatus	0.09	0.09	0.07	0.07	0.23
77 Electrical machinery, apparatus & appliances n.e.s.	0.09	0.06	0.07	0.08	0.15
78 Road vehicles (including air-cushion vehicles)	0.08	0.09	0.10	0.09	0.24
79 Other transport equipment	0.06	0.08	0.09	0.08	0.44
8 Misc. Manufactures	**0.10**	**0.09**	**0.11**	**0.10**	**0.27**
81 Sanitary, plumbing, heating and lighting fixtures	0.10	0.09	0.14	0.08	0.24
82 Furniture and parts thereof	0.13	0.09	0.17	0.12	0.39
83 Travel goods, handbags and similar containers	0.13	0.09	0.12	0.08	0.12
84 Articles of apparel and clothing accessories	0.06	0.09	0.07	0.10	0.48
85 Footwear	0.10	0.10	0.09	0.08	0.36

87 Professional, scientific & control instruments	0.06	0.05	0.07	0.08	0.09
88 Photographic apparatus, optical goods, watches	0.09	0.08	0.12	0.11	0.19
89 Miscellaneous manufactured articles n.e.s.	0.11	0.11	0.13	0.13	0.27
All goods	**0.15**	**0.14**	**0.18**	**0.13**	**0.31**

Table 2. Transport costs in descending order

SITC-2D	SITC	CT-AR	CT-BR	CT-CH	CT-UR	CT-Bo	Aver-4	Aver-5
3 Mineral fuels, lubricants	3	0.31	0.18	0.27	0.37	0.17	0.28	0.26
0 Food and live animals	0	0.19	0.18	0.21	0.14	0.36	0.27	0.22
2 Crude Materials	2	0.13	0.21	0.28	0.12	0.28	0.18	0.20
6 Manufactured Goods	6	0.10	0.11	0.13	0.10	0.41	0.11	0.17
8 Misc. Manufactures	8	0.10	0.09	0.11	0.10	0.27	0.10	0.13
5 Chemicals & Related Products	5	0.11	0.09	0.12	0.09	0.23	0.10	0.13
4 Animal & Vegetable oils, fats	4	0.15	0.13	0.12	0.08	0.16	0.12	0.13
1 Beverages & Tobacco	1	0.12	0.12	0.15	0.07	0.15	0.12	0.12
7 Machinery & Transport Equipment	7	0.09	0.07	0.07	0.08	0.15	0.08	0.09

Table 3. Comparison of unweighted and weighted sectoral freight rates for Argentinean imports (CIF/FOB)-1

1998 Average Freight Rates	Unweithed	Weighted
SITC-2D:		
0 Food and live animals	**0.19**	**0,10**
00 Live animals chiefly for food	0.45	0,27
01 Meat and meat preparations	0.05	0,04
02 Dairy products and birds' eggs	0.15	0,09
03 Fish, crustaceans, molluscs, preparations thereof	0.11	0,06
04 Cereals and cereal preparations	0.44	0,14
05 Vegetables and fruit	0.26	0,11
06 Sugar, sugar preparations and honey	0.08	0,06
07 Coffee, tea, cocoa, spices, manufactures thereof	0.07	0,07
08 Feeding stuff for animals, not including unmilled cereals	0.26	0,07
09 Miscellaneous edible products and preparations	0.07	0,07
1 Beverages & Tobacco	**0.12**	**0,06**
11 Beverages	0.15	0,05
12 Tobacco and tobacco manufactures	0.10	0,06
2 Crude Materials	**0.13**	**0,12**
21 Hides, skins and fur-skins, raw	0.04	0,04
22 Oil seeds and oleaginous fruit	0.26	0,14
23 Crude rubber (including synthetic and reclaimed)	0.12	0,09
24 Cork and wood	0.12	0,13
25 Pulp and waste paper	0.16	0,17
26 Textile fibres (except wool tops) and their wastes	0.11	0,08
27 Crude fertilizers and crude materials (excluding coal)	0.15	0,27
28 Metalliferous ores and metal scrap	0.11	0,08
29 Crude animal and vegetable materials, n.e.s.	0.08	0,07
3 Mineral fuels, lubricants	**0.31**	**0,30**
32 Coal, coke and briquettes	0.75	0,70
33 Petroleum, petroleum products and related materials	0.11	0,13
34 Gas, natural and manufactured	0.08	0,08
4 Animal & Veg oils, fats	**0.15**	**0,11**
41 Animal oils and fats	0.21	0,19
42 Fixed vegetable oils and fats	0.10	0,05
43 Animal-vegetable oils-fats, processed, and waxes	0.14	0,10
5 Chemicals & Related Products	**0.11**	**0,08**
51 Organic chemicals	0.06	0,04
52 Inorganic chemicals	0.12	0,12

53	Dyeing, tanning and colouring materials	0.09	0,06
54	Medicinal and pharmaceutical products	0.04	0,03
55	Essential oils & perfume materials; toilet polishing and cleansing preparations	0.11	0,06
56	Fertilizers, manufactured	0.25	0,22
57	Explosives and pyrotechnic products	0.08	0,07
58	Artificial resins, plastic materials, cellulose esters and ethers	0.13	0,07
59	Chemical materials and products, n.e.s.	0.11	0,05
6 Manuf. Goods		**0.10**	**0,08**
61	Leather, leather manufactures, n.e.s. and dressed furskisg	0.08	0,05
62	Rubber manufactures, n.e.s.	0.09	0,07
63	Cork and wood manufactures (not furniture)	0.10	0,06
64	Paper, paperboard, articles of paper, paper-pulp/board	0.10	0,09
65	Textile yarn, fabrics, made-up articles, related products	0.08	0,07
66	Non-metallic mineral manufactures, n.e.s.	0.12	0,11
67	Iron and steel	0.10	0,08
68	Non-ferrous metals	0.10	0,06
69	Manufactures of metal, n.e.s.	0.11	0,13
7 Machinery & Transp. Equip.		**0.09**	**0,05**
71	Power generating machinery and equipment	0.08	0,05
72	Machinery specialized for particular industries	0.07	0,04
73	Metalworking machinery	0.06	0,04
74	General industrial machinery & equipment, and parts	0.08	0,05
75	Office machines & automatic data processing equipment	0.17	0,04
76	Telecommunications & sound recording apparatus	0.09	0,02
77	Electrical machinery, apparatus & appliances n.e.s.	0.09	0,06
78	Road vehicles (including air-cushion vehicles)	0.08	0,06
79	Other transport equipment	0.06	0,04
8 Misc. Manufactures		**0.10**	**0,07**
81	Sanitary, plumbing, heating and lighting fixtures	0.10	0,08
82	Furniture and parts thereof	0.13	0,11
83	Travel goods, handbags and similar containers	0.13	0,09
84	Articles of apparel and clothing accessories	0.06	0,03
85	Footwear	0.10	0,10
87	Professional, scientific & controlling instruments	0.06	0,04
88	Photographic apparatus, optical goods, watches	0.09	0,04

89	Miscellaneous manufactured articles, n.e.s.	0.11	0,07
All goods		**0.15**	**0.09**

Table 4. Percentage shares of sectoral imports with respect to total imports from the EU

1998 %shares SITC-2D:	M from the EU-15					
	Argent.	Bolibia	Brazil	Chile	Paraguay	Uruguay
0 Food and live animals	**2.04**	**3.26**	**3.53**	**2.11**	**1.44**	**3.13**
00 Live animals chiefly for food	0.03	0.07	0.04	0.06	0.00	0.03
01 Meat and meat preparations	0.47	0.02	0.04	0.07	0.02	0.08
02 Dairy products and birds' eggs	0.17	2.06	0.44	0.49	0.05	0.12
03 Fish, crustaceans, molluscs, preparations thereof	0.14	0.09	1.11	0.09	0.08	0.46
04 Cereals and cereal preparations	0.20	0.42	0.65	0.17	0.23	0.27
05 Vegetables and fruit	0.38	0.06	0.71	0.24	0.48	1.14
06 Sugar, sugar preparations and honey	0.08	0.11	0.09	0.07	0.11	0.15
07 Coffee, tea, cocoa, spices, manufactures thereof	0.21	0.13	0.08	0.23	0.19	0.38
08 Feeding stuff for animals, not including unmilled cereals	0.15	0.16	0.14	0.21	0.16	0.12
09 Miscellaneous edible products and preparations	0.23	0.14	0.24	0.48	0.13	0.39
1 Beverages & Tobacco	**0.58**	**1.33**	**0.81**	**0.82**	**19.97**	**5.75**
11 Beverages	0.56	1.30	0.70	0.80	19.71	5.15
12 Tobacco and tobacco manufactures	0.02	0.02	0.11	0.03	0.26	0.59
2 Crude Materials	**0.64**	**1.03**	**0.77**	**1.04**	**0.20**	**1.00**
21 Hides, skins and fur-skins, raw	0.04	0.00	0.02	0.00	0.00	0.00
22 Oil seeds and oleaginous fruit	0.00	0.00	0.00	0.00	0.00	0.00
23 Crude rubber (including synthetic and reclaimed)	0.05	0.03	0.05	0.04	0.00	0.32
24 Cork and wood	0.05	0.00	0.04	0.03	0.00	0.01
25 Pulp and waste paper	0.02	0.00	0.01	0.01	0.01	0.00
26 Textile fibres (except wool tops) and their wastes	0.07	0.83	0.09	0.51	0.16	0.11
27 Crude fertilizers and crude materials (excluding coal)	0.09	0.03	0.14	0.07	0.01	0.21
28 Metalliferous ores and metal scrap	0.01	0.01	0.09	0.00	0.00	0.00
29 Crude animal and vegetable materials, n.e.s.	0.31	0.14	0.33	0.37	0.02	0.34
3 Mineral fuels, lubricants	**1.07**	**0.16**	**1.85**	**0.69**	**0.83**	**0.99**
32 Coal, coke and briquettes	0.00	0.00	0.00	0.01	0.00	0.00
33 Petroleum, petroleum products and related materials	1.07	0.16	1.70	0.64	0.83	0.98

34 Gas, natural and manufactured	0.00	0.00	0.15	0.05	0.00	0.00
4 Animal & Veg. oils, fats	**0.16**	**0.27**	**0.42**	**0.30**	**0.14**	**0.20**
41 Animal oils and fats	0.02	0.03	0.01	0.01	0.00	0.02
42 Fixed vegetable oils and fats	0.09	0.22	0.37	0.08	0.10	0.17
43 Animal-vegetable oils-fats, processed, and waxes	0.05	0.01	0.04	0.21	0.04	0.01
5 Chemicals & Related Products	**15.12**	**13.25**	**15.90**	**11.92**	**16.76**	**14.76**
51 Organic chemicals	4.05	1.95	5.08	1.14	0.99	1.77
52 Inorganic chemicals	0.76	3.22	0.65	0.40	0.21	0.31
53 Dyeing, tanning and colouring materials	0.94	1.16	1.07	2.15	0.42	1.78
54 Medicinal and pharmaceutical products						
55 Essential oils & perfume materials; toilet polishing and cleansing preparations	3.91	2.42	3.87	2.11	8.42	3.97
56 Fertilizers, manufactured	1.14	1.14	0.94	1.74	3.55	2.06
57 Explosives and pyrotechnic products	0.12	0.21	0.74	0.43	0.03	0.15
58 Artificial resins, plastic materials, cellulose esters and ethers	0.00	0.00	0.00	0.00	0.00	0.00
59 Chemical materials and products, n.e.s.	2.05	1.47	1.88	1.52	1.08	2.07
6 Manuf. Goods	2.15	1.68	1.66	2.43	2.06	2.65
61 Leather, leather manufactures, n.e.s. and dressed furskisg	**12.97**	**9.40**	**11.70**	**16.82**	**6.82**	**11.79**
62 Rubber manufactures, n.e.s.	0.10	0.08	0.09	0.20	0.00	0.13
63 Cork and wood manufactures (not furniture)	1.05	0.31	1.00	1.40	0.55	0.55
	0.52	0.08	0.13	1.21	0.03	0.23
64 Paper, paperboard, articles of paper, paper-pulp/board	3.20	2.24	1.89	2.90	2.50	2.17
65 Textile yarn, fabrics, made-up articles, related products	1.21	0.79	1.33	2.46	0.74	3.07
66 Non-metallic mineral manufactures, n.e.s.	1.41	2.03	1.47	1.84	1.03	1.92
67 Iron and steel	1.77	1.63	1.86	2.31	0.23	1.14
68 Non-ferrous metals	0.49	0.17	1.39	0.70	0.15	0.17
69 Manufactures of metal, n.e.s.	3.23	2.08	2.55	3.79	1.59	2.41
7 Machinery & Transp. Equip.	**57.58**	**60.83**	**57.10**	**54.15**	**37.00**	**51.33**
71 Power generating machinery and equipment	6.73	4.88	6.39	5.22	1.56	1.03
72 Machinery specialized for particular industries	7.52	14.69	10.08	12.47	6.72	10.90

73 Metalworking machinery	1.00	0.43	2.06	1.02	0.04	0.33
74 General industrial machinery & equipment, and parts	9.56	10.60	9.65	11.52	3.22	7.24
75 Office machines & automatic data processing equipment	0.86	0.34	1.18	1.16	0.98	0.43
76 Telecommunications & sound recording apparatus	4.33	13.12	4.79	6.18	7.03	2.87
77 Electrical machinery, apparatus & appliances n.e.s.	7.70	5.12	7.33	6.12	7.46	8.59
78 Road vehicles (including air-cushion vehicles)	19.42	10.61	10.97	7.26	9.91	19.43
79 Other transport equipment	0.45	1.04	4.64	3.20	0.09	0.52
8 Misc. Manufactures	**9.84**	**10.48**	**7.92**	**12.15**	**16.84**	**11.05**
81 Sanitary, plumbing, heating and lighting fixtures	0.40	0.28	0.12	0.85	0.19	0.57
82 Furniture and parts thereof	0.71	0.47	0.62	0.96	0.23	1.38
83 Travel goods, handbags and similar containers	0.03	0.02	0.04	0.09	0.03	0.09
84 Articles of apparel and clothing accessories	0.69	0.47	0.34	2.05	0.66	1.30
85 Footwear	0.04	0.10	0.03	0.77	0.10	0.17
87 Professional, scientific & controlling instruments	2.51	2.34	3.14	2.47	3.93	1.85
88 Photographic apparatus, optical goods, watches	0.88	0.71	0.87	0.86	1.64	0.66
89 Miscellaneous manufactured articles, n.e.s.	4.58	6.10	2.78	4.11	10.06	5.03
All goods						

Table 5. Main products imported from the EU

1998 % Over total	**M from the EU**					
SITC	**Argent.**	**Bolivia**	**Brazil**	**Chile**	**Paraguay**	**Uruguay**
78	19.42	10.61	10.97	7.26	9.91	19.43
74	9.56	10.60	9.65	11.52	3.22	7.24
77	7.70	5.12	7.33	6.12	7.46	8.59
72	7.52	14.69	10.08	12.47	6.72	10.90
71	6.73	4.88	6.39	5.22	1.56	1.03
89	4.58	6.10	2.78	4.11	10.06	5.03
76	4.33	13.12	4.79	6.18	7.03	2.87
51	4.05	1.95	5.08	1.14	0.99	1.77
54	3.91	2.42	3.87	2.11	8.42	3.97
69	3.23	2.08	2.55	3.79	1.59	2.41
64	3.20	2.24	1.89	2.90	2.50	2.17
87	2.51	2.34	3.14	2.47	3.93	1.85
59	2.15	1.68	1.66	2.43	2.06	2.65
58	2.05	1.47	1.88	1.52	1.08	2.07

67	1.77	1.63	1.86	2.31	0.23	1.14
%	**82.72**	**80.91**	**73.90**	**71.54**	**66.76**	**73.11**

Table 6. Imports by transportation mode

Country	Air	Road	Rail	Maritime (including river and lake)	Others and not stated
Argentina	17.49%	22.34%	0.65%	56.57%	2.96%
Bolivia	0.00%	0.00%	0.00%	0.00%	100.00%
Brazil	24.31%	8.20%	0.21%	66.72%	0.56%
Chile	17.02%	11.42%	0.09%	68.09%	3.38%
Uruguay	12.47%	42.45%	0.10%	44.95%	0.03%

Table 7.1. Spatial structure of freight rates for five importers in 1998

Intercepts	Constant	Weight-value (kg/$)	Distance to exporter	Importer Infrastructure	Exporter Infrastructure	R^2	obs
Model 1: Pooled regression							
Argentina	-5.42	0.243 (46.84)	0.535 (5.39)	-	-	0.312	7298
Bolivia	-4.86						
Brazil	-5.34						
Chile	-5.31						
Uruguay	-5.39						
Model 2: Regression with sectoral dummies							
Argentina	-4.83	0.256 (34.37)	0.687(7.12)	-	-	0.383	7298
Bolivia	-4.69						
Brazil	-4.25						
Chile	-4.73						
Uruguay	-4.78						
Model 3: Regression with distance-specific coefficients							
			Average Coefficient				
Argentina	-6.73	0.2561 (34.37)	0.6889 (7.12)	-	-	0.383	7298
Bolivia	-6.16						
Brazil	-6.59						
Chile	-6.63						
Uruguay	-6.68						

Model 4: Regression with sectoral and landlocked dummies							
				Landlocked	Lang		
	-3.07 (-5.61)	0.256 (34.66)	0.501 (8.89)	0.48 (19.61)	-0.05 (-2.57)	0.386 0	7313
Model 5: Regression with sectoral dummies and infrastructure variables							
				Lvinfi	Lvinfj		
	-0.64 (-1.16)	0.2602 (35.03)	0.14 (2.41)	-0.29 (-17.1)	-0.05 (-3.23)	0.369	7298
				Liporti	Liportj		
	-3.08 (-5.42)	0.264 (25.47)	0.54 (8.81)	-0.37 (-14.37)	0.10 (0.038)	0.360	7313
Model 6: Regression with sectoral dummies, infrastructure variables and exports volume							
Mvol				Lvinfi	Lvinfj		
-0.10 (-31.58)	3.21 (6.07)	0.28 (40.59)	-0.07 (0.22)	-0.13 (12.78)	-0.02 (-1.64)	0.47	7328
Model 7: Regression with sectoral dummies, infrastructure variables and estimated exports volume							
Mvolf				Lvinfi	Lvinfj		
-0.06 (-11.83)	1.86 (3.13)	0.27 (26.82)	0.006 (0.10)	-0.18 (9.71)	-0.03 (-2.10)	0.39	7328

Notes: Landlocked is a dummy that takes the value one when a country is landlocked, zero otherwise. Lang is a dummy that takes the value one when the trading countries speak a common language, zero otherwise. Lvinfi and Lvinfj are infrastructure indices of countries i and j. Liporti and Liportj are port infrastructure measures for countries i and j. Mvol denotes import volume traded between countries i and j and Mvolf are estimated imports obtained from Model ... in Table 8.

Table 7.2. Sectoral structure of freight rates for five importers in 1998

Sectors	Constant	Weight-value (kg/$)	Distance to exporter	Landlocked country dummy	Own Infrastr.	Partner Infrastr.	Adj. R^2	No s
0	-3.29 (-1.93) -0.98 (-0.57)	0.232 (5.54)* 0.234 (5.53)*	0.50 (2.68)** 0.128 (0.65)	0.478 (4.58)* -	- -0.36 (-5.42)*	-	0.313 0.331	67
1	-3.32(-0.74) -0.59 (-0.13)	0.36(5.17)* 0.37 (5.52)*	0.38 (0.80) -0.05 (-0.12)	0.30 (1.85)* -	- -0.45 (-2.88)*	-	0.234 0.271	98
2	-3.45 (-1.32)	0.258 (8.89)*	0.281 (1.00)	0.95	-	-	0.338	39

	0.59 (0.22)	0.263 (9.13)*	-0.32 (- 1.09)	(7.14)* -	-0.50(- 5.50)*		0.314	
3	-11.13 (- 2.45) -8.59 (-1.82)	0.191 (4.72)* 0.183 (4.49)*	1.208 (2.46)* 0.838 (1.59)	0.526 (2.50)* -	- -0.27 (- 1.80)*	-	0.438 0.420	96
4	-2.93 (-0.59) 0.12 (0.02)	0.127 (2.10)* 0.127 (3.28)*	0.19 (0.36) -0.29 (- 0.25)	0.46 (2.97)* -	- -0.42 (- 2.92)*	-	0.194 0.221	95
5	-6.64 (- 4.81)* -3.13 (- 2.29)**	0.239 (14.60)* 0.244 (14.94)*	0.61(1.08)* 0.11 (0.72)	0.51 (8.19)* -	- -0.36 (- 8.28)*	- -0.14 (- 3.63)*	0.394 0.397	116 4
6	-5.02 (- 4.96)* -2.09 (- 2.00)**	0.204 (14.28)* 0.207 (14.18)*	0.483 (4.39)* 0.066 (0.57)	0.55 (10.47)* -	- -0.27 (- 7.61)*	- -0.09 (- 2.98)*	0.273 0.250	169 0
7	-4.63 (- 4.85)* -2.86 (- 2.90)*	0.276 (19.75)* 0.283 (20.03)*	0.473 (4.62)* 0.20 (1.89)**	0.405 (9.36)* -	- -0.23 (- 7.85)*	- -0.01 (- 0.53)	0.321 0.309	200 2
8	-4.28 (- 3.04)* -2.97 (- 2.09)*	0.343 (19.55)* 0.356 (19.81)*	0.538 (3.53)* 0.345 (2.21)*	0.402 (7.07)* -	- -0.18 (- 4.61)*	- 0.03 (0.88)	0.449 0.925 3	110 8

Note: *, **, ***, denotes significance level at 1, 5 and 10% respectively.

Table 8.1. Aggregated estimates of Import Demand

	Constant	Importer GDP	Exporter GDP	Distance to exporter	Land locked	Lang	Importer Infrastr.	Exporter Infrastr.	Adj. R^2
Model 1: Pooled regression									
	-37.83 (0.68)	0.68 (30.17)	1.06 (31.85)	-0.53 (-2.03)	-	-		-	0.207
Model 2: Regression with sectoral dummies									
	-40.57 (-14.57)	0.69 (32.47)	1.13 (35.10)	-0.70 (-2.89)	-	-		-	0.344
Model 3 Regression with sectoral, landlocked and language dummies									
	-43.19 (-12.11)	0.618 (20.24)	1.14 (35.13)	-0.24 (-0.83)	-0.83 (-9.18)	1.36 (14.3)		-	0.368
Model 4: Regression with sectoral dummies and infrastructure variables									
							Lvinfi	Lvinfj	
	-38.03 (-13.56)	0.64 (28.06)	1.14 (33.59)	-0.77 (-3.15)	-	-	0.28 (3.96)	-0.10 (-1.52)	0.345
Model 5: Regression with sectoral dummies and port efficiency									
							Liporti	Liportj	
	-4.66 (-0.98)	0.28 (6.15)	1.07 (33.26)	-3.48 (-0.33)	-		2.31 (10.78)	-0.44 (-2.12)	0.359
Model 6: Regression with sectoral and language dummies and port efficiency									
								Liportj	

				Lang	Liporti			
-34.92	0.53	1.12	-0.90	-1.19	1.22	-0.59		0.370
(-6.31)	(10.34)	(5.23)	(-1.86)	(11.51)	(5.23)	(-2.79)		

Model 7: Regression with sectoral and language dummies, infrastructure and transport costs

				Lang	Lvinfi	Lvinfj	LTC	
-34.20	0.71	0.99	-	0.97	0.27	-0.10	-0.79	0.47
(-35.16)	(42.86)	(38.72)	-	(13.86)	(4.95)	(-1.06)	(-20.8)	
				Lang	Lvinfi	Lvinfj	LTCF	
-27.66	0.53	0.85	-	1.03	-	-	-2.29	0.54
(-31.23)	(34.31)	(38.23)	-	(9.72)		-	(-43.3)	

Notes: Landlocked is a dummy that takes the value one when a country is landlocked, zero otherwise. Lang is a dummy that takes the value one when the trading countries speak a common language, zero otherwise. Lvinfi and Lvinfj are infrastructure indices of countries i and j. Liporti and Liportj are port infrastructure measures for countries i and j. LTC denotes freight rates and LTCF are estimated transport costs obtained from Model 6 in Table 7.

Table 8.2. Sectoral Estimates of Import Demand

Sect.	Constant	Importer GDP	Exporter GDP	Distance to exporter	Land locked dummy	Own Infrastr.	Partner Infrastr.	Adj. R^2
0	2.26 (0.22) -11.30 (-1.27)	0.349 (3.66)* 0.512 (6.80)*	0.19 (1.68)*** 0.15 (1.26)	-1.60 (-1.86)** -0.38 (-0.49)	-1.17 (-2.57)* -	- 0.26 (1.08)	- 0.467 (1.93)*	0.176 0.172
1	41.55 (1.67) 17.31 (0.77)	-0.03 (-0.17) 0.20 (1.09)	0.67 (2.69)* 0.53 (1.93)**	-5.80 (-2.47)* -2.96 (-1.48)***	-2.57 (-2.26)* -	- 1.18 (1.94)**	- 0.86 (1.58)***	0.239 0.240
2	28.45 (1.68)*** 4.99 (0.35)	0.05 (0.35) 0.29 (2.42)*	0.36 (2.04)** 0.40 (2.13)**	-3.89 (-2.98)* -1.99 (-1.70)***	-2.13 (-2.89)* -	- 0.48 (1.23)	- 0.003 (0.01)	0.109 0.091
3	-81.36 (-1.82)** -101.5 (-2.73)*	1.05 (2.539)* 1.20 (3.84)*	2.21 (4.93)* 2.26 (4.98)*	-0.14 (-0.04) 1.78 (0.57)	-1.81 (-0.99) -	- 0.91 (0.93)	- -0.45 (-0.50)	0.368 0.362
4	-5.31 (-0.11) -2.66 (-0.07)	0.33 (1.00) 0.36 (1.51)***	-0.58 (-1.48) -0.76 (-1.72)***	1.69 (0.46) 1.47 (0.49)	0.23 (0.16) -	- -0.31 (-0.41)	- 0.60 (0.94)	0.016 0.015
5	-34.77 (-3.96)* -54.00 (-7.56)*	0.64 (8.58)* 0.82 (14.61)*	1.30 (17.08)* 1.24 (16.09)*	-1.34 (-1.83)** 0.57 (0.35)	-1.32 (-3.82)* -	- 0.42 (2.36)*	- 0.64 (4.01)*	0.354 0.357
6	-15.88 (-2.46)* -33-64 (-5.91)*	0.48 (7.97)* 0.84 (14.96)*	1.07 (15.80)* 1.125 (15.15)*	-2.72 (-5.11)* -1.48 (-2.97)*	-1.68 (-6.09)* -	- 0.31 (2.07)**	- -0.31 (-2.23)**	0.351 0.341
7	-51.72 (-8.86)* -52.61(-10.58)*	0.66 (12.32)* 0.71 (16.92)*	1.37 (24.32)* 1.46 (24.62)*	0.07 (0.16) -0.21 (-0.50)	-0.42 (-1.69)*** -	- 0.06 (0.49)	- -0.64 (-5.68)*	0.390 0.399
8	-5.14 (-0.96) -25.13 (-3.88)*	0.30 (4.70)* 0.54 (10.45)*	1.22 (16.40)* 1.21 (15.04)*	-3.52 (-5.60)* -1.91 (-3.33)*	-1.51 (-5.38)* -	- 0.22 (1.42)***	- 0.18 (1.15)	0.381 0.361

Note: *,**,***, denotes significance level at 1, 5 and 10% respectively.