



Universiteit
Leiden
The Netherlands

Shipping costs: a rising challenge to the region's competitive development

Alvarez, M.; Duran Lima, J.E.

Citation

Alvarez, M., & Duran Lima, J. E. (2007). Shipping costs: a rising challenge to the region's competitive development. *Bulletin On Trade Facilitation And Transport In Latin America And The Caribbean*, (256). Retrieved from <https://hdl.handle.net/1887/20567>

Version: Not Applicable (or Unknown)

License: [Leiden University Non-exclusive license](#)

Downloaded from: <https://hdl.handle.net/1887/20567>

Note: To cite this publication please use the final published version (if applicable).



SHIPPING COSTS: A RISING CHALLENGE TO THE REGION'S COMPETITIVE DEVELOPMENT

This issue of the FAL Bulletin examines the impact of shipping costs on the exports of five Latin American and Caribbean countries by analysing the difference between the unit value of goods at the port of origin and at the port of destination, in three of the region's main external markets.

In the past few years, international trade has outpaced GDP in terms of growth. The buoyant economies of China and India and their positive influence on world trade have driven up commodity prices and stimulated export activity in the region. Also, some countries, such as Chile, Mexico and Peru, have signed free trade and association agreements, which has increased the efficiency of border procedures and improved the conditions for market access. Attention now needs to be turned to the other significant barriers to trade and ways in which they might be tackled. Shipping costs (mainly insurance and freight) are now considered to be one of the main obstacles limiting the region's export growth potential.

Four factors were revealed by the analysis to significantly drive up shipping costs: (a) distance; (b) economies of scale; (c) mode of transport; and (d) product type. The results also showed that, in some cases, the shipping costs incurred in exporting a product could be twice as high as the tariff applied to that product.

The costs analysed in this study consist mainly of transportation expenses. Though not the sole component, transportation expenses are certainly the most significant contributor to shipping costs and largely explain the phenomenon. Transportation is also the one area, however, that affords significant opportunities for implementing innovative and creative trade policies and for reducing the expenses currently generated by logistical shortfalls. One of the goals of this article is to draw attention to the urgent need to upgrade and streamline shipping infrastructure and procedures in Latin America and the Caribbean so as to lower export costs in the region.

For further information, please contact the authors: Jose.Duran@cepal.org and Mariano.Alvarez@cepal.org of the International Trade and Integration Division. The authors would like to thank Jan Hoffmann, Mikio Kuwayama, Marcelo Lafleur, Sebastián Sáez and Ricardo Sánchez for their invaluable comments and contributions during the preparation of this issue.

1. Current Status of the Latin American Export Sector

Latin American and Caribbean goods exports have grown faster over the past six years than during the 15 preceding years. The growth rate for the five countries selected for inclusion in this study (Argentina, Brazil,

Chile, Mexico and Peru) together surpassed growth for the region and for the world as a whole. This is largely due to the steady rise in commodity prices that the region has enjoyed since the turn of the century (see graphs 1a and 1b).

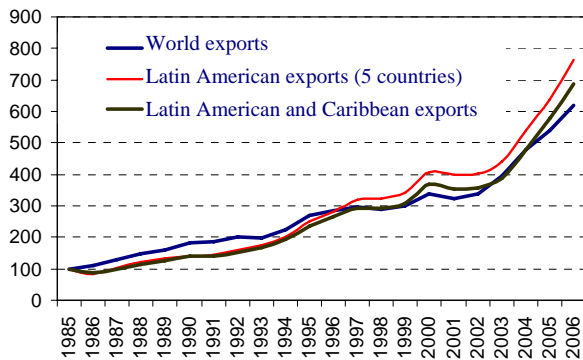


This new export boom has been accompanied by a decline in tariffs in the region. There have also been significant increases in oil and maritime transport prices, however, (graphs 1c and 1d), which have made it increasingly expensive to place products in foreign markets. In order to improve the region's competitiveness and maximize profits, therefore, shipping costs

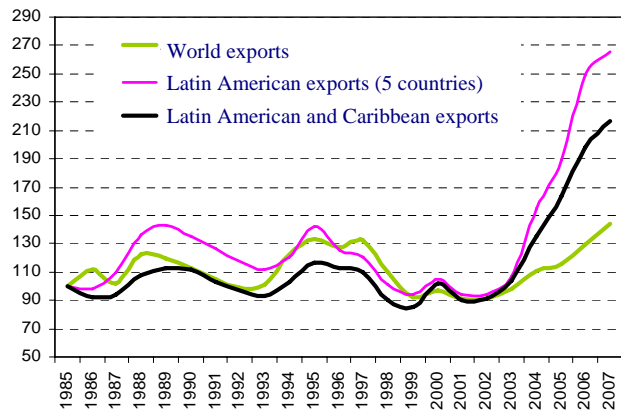
must be lowered and logistics must be optimized. The profits from export activities are currently partially reaped by intermediaries, a situation that adversely affects not only the export sectors of the region's countries, but also the consumers in the destination markets as prices for products are pushed up without there being a parallel improvement in quality.

Graph 1
Evolution of exports, prices and transport costs
(Index numbers and dollars per barrel)

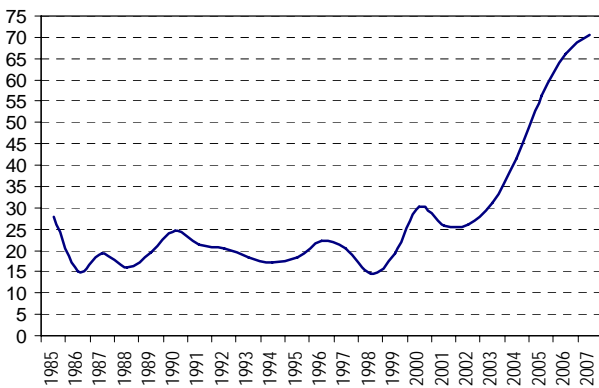
A. Goods Exports (1985=100)



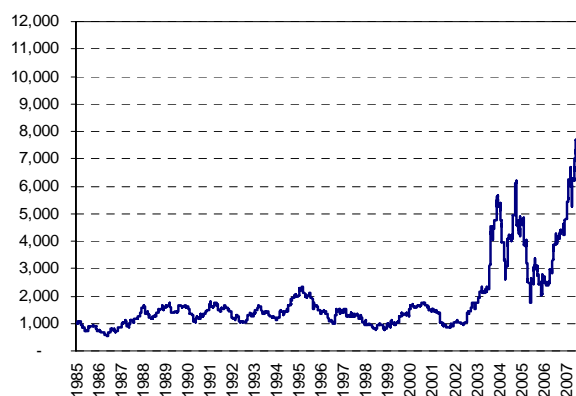
B. Selected Latin American Commodities (1985=100)



C. West Texas Oil Price (dollars per barrel)



D. Baltic Exchange Dry Index (1985=1000)



Source: Prepared by the authors, on the basis of data obtained from the WTO (goods exports), ECLAC (commodity prices) and Bloomberg (BEDI and WTOP).

The region's countries therefore face a complex situation. On the one hand, international prices for their exports are rising, and many (but not all) tariff barriers are being reduced through GSP programmes and FTAs, etc., which is opening up

more competitive opportunities for exporters. On the other hand, the region's trade potential is being limited by the rising cost of placing goods in foreign markets.



The proportion of shipping costs associated with the transportation of goods between the port of origin and the port of destination is analysed below. The costs incurred between the factory and the port of origin and between the port of destination and the final consumer are not included in this analysis.

2. Sample

The five countries included in the study were selected on the basis of a basket of products

identified with up to five digits under the Standard International Trade Classification system (SITC Rev.3) that were considered representative of the different trade sectors. Products from the categories starting with the numbers 3 (Mineral fuels and lubricants) and 9 (postal packages, special transactions, coins and non-monetary gold) were not taken into account. The five countries together account for 95% of the region's total exports of the 30 products included in the sample (see table 1 and graph 2).

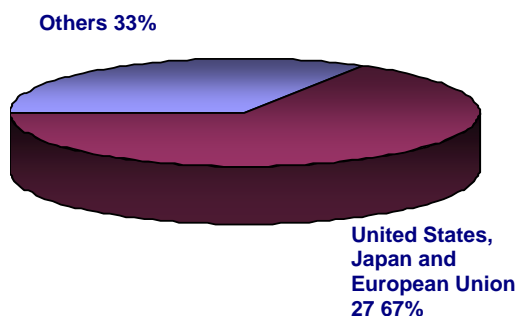
Table 1
LIST OF THE 30 PRODUCTS USED AS A REPRESENTATIVE SAMPLE
(SITC Revision 3)

<i>Refrigerated primary products</i>	<i>Frozen pork (01222); frozen poultry cuts (01235); frozen salmonidae (03421); frozen fish fillets (0344); chilled fish fillets and other fish meat (03451); fresh grapes (05751)</i>
<i>Non-refrigerated primary products</i>	Coffee, not roasted, not decaffeinated (07111); oilcake of soya beans (08131); flours, meals and pellets of fish, unfit for human consumption (08142); soya beans (2222)
<i>Forestry products</i>	Wood of coniferous species, of a thickness exceeding 6 mm (2482); wood of coniferous species, continuously shaped (2483).
<i>Minerals and metals</i>	Iron ore and concentrates (2815); copper ores and concentrates (2831); zinc ores and concentrates (2875); molybdenum ores and concentrates, roasted (28781); molybdenum ores and concentrates, other than roasted (28782); ferrous products (67133); ferronickel (67155); unwrought silver, (68113); unrefined copper (68211); refined copper (68212); aluminium, not alloyed (68411)
<i>Electronics</i>	Television receivers, colour (7611); transmission apparatus incorporating reception apparatus (76432); telecommunications parts and apparatus (76493)
<i>Automobiles</i>	Motor vehicles for the transport of persons (7812); motor vehicles for the transport of goods (78219)
<i>Clothing</i>	T-shirts of all kinds (8454)
<i>Footwear</i>	Footwear with outer soles of leather (85148)

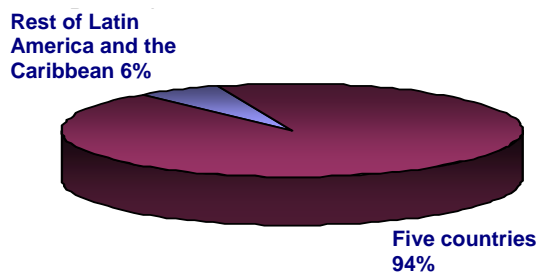
Source: Prepared by the authors.

Graph 2
EXPORTS FROM LATIN AMERICA AND THE CARIBBEAN
BY DESTINATION AND BASKET OF SELECTED PRODUCTS

A. Structure by selected destinations



B. Total exports of the 30 products^a



Source: Prepared by the authors, on the basis of data obtained from World Bank, The World Integrated Trade Solution (WITS) software.
a: Excludes SITC categories 3 and 9 from the total.



Of the average total exports recorded for the 33 countries of Latin America and the Caribbean between 2004 and 2005, over 65% were destined for the markets of the United States, Japan or the European Union (27 members). The analysis therefore focuses on these markets.

3. Results and Analysis

As shown in table 2, as far as trade barriers are concerned, import duties are becoming less of an obstacle, but shipping costs are becoming increasingly relevant for exporters. The comparison between the effective duties¹ paid by the five selected countries in the three chosen markets and the costs of shipping goods to those markets² reveals the huge gap that currently

exists between tariffs and shipping costs in terms of their impact on export costs.

In the United States market, although tariffs are at or close to 0% for most groups of products, shipping costs are high. This applies to all the destination markets analysed. The impact of shipping costs is almost 17 times higher than the corresponding average tariff for the group of products in question in the United States, twice as high in the Japanese market (which, of the three countries analysed, is the one with the highest import duties), and 19 times higher in the case of the European Union. If Mexico is excluded from the analysis, the shipping costs involved in exporting to all three markets are similar (see table 2).

Table 2
FIVE COUNTRIES: TARIFF APPLIED AND SHIPPING COSTS

Groups	United States		Japan		European Union	
	Tariff applied	Shipping costs	Tariff applied	Shipping costs	Tariff applied	Shipping costs
<i>Refrigerated primary products</i>	0.0%	60.1%	40.8%	20.7%	11.2%	23.9%
<i>Non-refrigerated primary products</i>	0.0%	12.8%	0.0%	16.4%	0.0%	18.7%
<i>Forestry products</i>	0.0%	30.2%	0.0%	31.8%	0.0%	18.6%
<i>Minerals and metals</i>	0.1%	8.7%	0.0%	14.9%	0.2%	14.1%
<i>Electronics</i>	0.0%	2.5%	0.0%	31.6%	0.1%	80.3%
<i>Automobiles</i>	0.0%	5.1%	0.0%	24.0%	1.4%	9.4%
<i>Clothing</i>	4.2%	0.8%	8.9%	24.6%	4.9%	27.8%
<i>Footwear</i>	6.5%	6.6%	19.5%	21.5%	4.1%	12.6%
<i>Weighted Total</i>	0.4%	6.7%	9.6%	16.8%	0.9%	17.2%
Weighted without Mexico	2.4%	16.4%	9.6%	17.4%	1.0%	17.1%

Source: Prepared by the authors on the basis of data obtained from the United Nations, Commodity Trade Database (COMTRADE); World Bank, The World Integrated Trade Solution (WITS) software; Statistical Office of the European Communities (EUROSTAT); United States International Trade Commission (USITC); Japan Customs.

The case of Mexico is special inasmuch as, of the three destination markets selected, one of them, the United States, accounts for around 90% of Mexico's total exports, and 70% of these are transported by road or rail³. There is only a slight difference between the weighted regional total shipping costs including Mexico and those same costs excluding Mexico as far as trade with Japan and the European Union are concerned, but the difference is considerable, almost

threefold, in the case of exports to the United States (see table 2). An analysis of the cost per product group reveals that the opportunity to use land transportation and the country's geographical proximity to the United States give Mexico considerable advantages in products such as automobiles and electronics (costs double for the other countries in these categories).



According to the analysis of the results, there are four important factors in shipping costs: (a) costs increase with distance, making closer destinations far less expensive; (b) economies of scale lower shipping costs and even mitigate the effect of distance; (c) the means of transport used influences costs; and (d) the product type can push costs up or down.

The influence of distance can be seen to be a direct relationship between geographic proximity and lower costs. In the case of Mexico, export costs for goods destined for the United States market are far lower than for exports to the European Union or Japan. Export costs to the United States are lower than to the European Union and Japan for all the region's exports taken as a whole as well, and manufactured goods on average are less expensive to export than other products (see table 2 and graph 4).

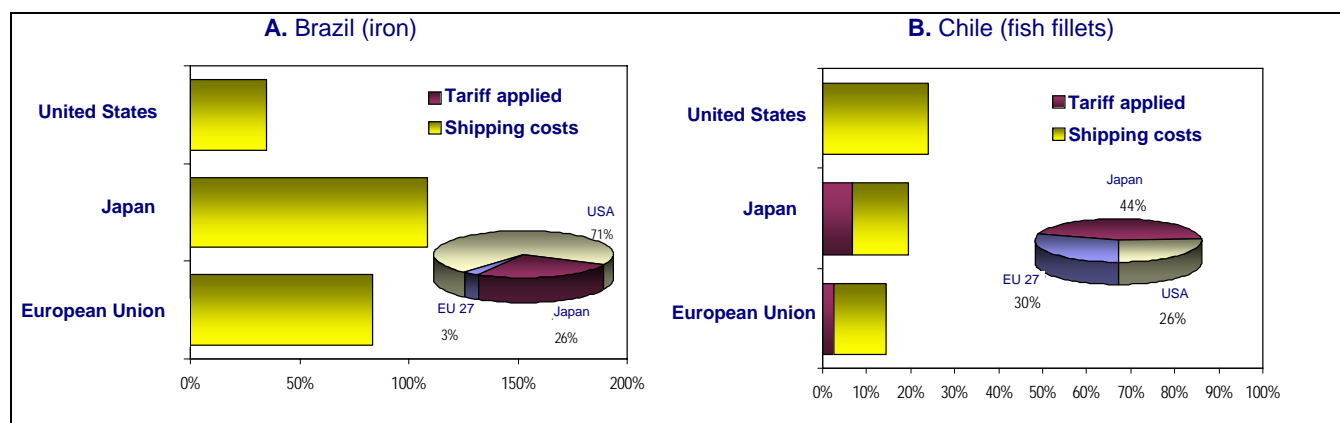
This can be seen to apply to the consolidated averages for the five countries presented in table 2. Doubling the distance results in an increase in cost of 16%⁴. Geographical location obviously matters and, to a certain extent, confers “competitive advantages”, but this does not mean that countries should focus all their export efforts on their closest markets. Nor should they overlook the possibilities of exporting to other, smaller

markets that might be considered less significant.

The presence of economies of scale, when expressed in terms of larger or smaller export volumes, turns out to be a significant determinant of cost. A comparison of the cost of exporting the same product to different destinations shows that the greater the export volume, the lower the associated cost. This is the case of Chile's frozen fish exports to Japan, and Brazil's iron exports to the United States, for example (see graph 3). Exporting to markets with less dynamic trade flows similarly involves greater costs. Various studies performed by Hoffmann, Wilmsmeier and Sánchez⁵ highlight this fact: “Shipping in one individual transaction 10,000 tonnes instead of 100 tonnes reduces transport costs per tonne by 43%” (FAL 191). Although not be considered a rule of thumb, this ratio did turn out to be applicable for most of the products under study.

It is important to note that increasing the volume of goods exported to distant ports can offset the unwanted influence of distance on costs. Simply sharing the fixed costs of shipping among more items makes exports more competitive.

Graph 3
SHIPPING COSTS^a AND DISTRIBUTION OF IRON AND FISH FILLET EXPORTS^b



Source: Prepared by authors on the basis of official figures.

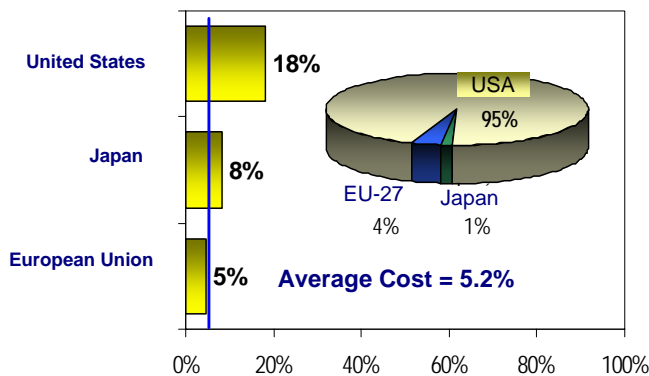
(a) As a percentage of product value.

(b) Structure of exports to the reference markets (pie chart).



In addition to geographical proximity, the means of transport used and the product type have a direct impact on the final shipping costs of a product. This is the case of the unit costs for exporting cars from Mexico to the United States, for example, where the main mode of transport is road transport which has only a slight bearing on the value of the product (5%). Shipping the same product to the European Union or Japan would require the use of maritime transport and would increase the influence of shipping costs on the value of the final product to 11% and 19%, respectively. The same applies for electronic goods such as television receivers, transmitters and telecommunications parts and apparatus.

Graph 4
SHIPPING COSTS^a AND DISTRIBUTION
OF IRON AND FISH FILLET EXPORTS^b



Source: Prepared by the authors, on the basis of official figures.
(a) As a percentage of product value.
(b) Structure of exports to the reference markets (pie chart).

Generally speaking, the shipping costs incurred in placing products in any of the three destination markets under analysis are, to say the least, high. They vary considerably, however, according to the product, country of origin and country of destination. The weighted average shipping costs for the five countries' exports to the United States is 1% in the case of textiles, but 60% in the case of refrigerated primary goods. An analysis of exports to the European market reveals similar disparities (see table 2).

The weight of shipping costs in the total costs of exports to the Japanese market varies less (slightly over 10%) from 15% of total costs

for metals and 32% for electronics, this is largely due to the determining factors mentioned above, and economies of scale in particular.

For practical purposes, the differences in costs for exports to the same market can be considered to reflect the variations in the region's competitiveness in different products. If shipping costs that constitute close to 0% of total export costs represent the highest degree of competitiveness, then the countries included in this study obviously enjoy a huge comparative advantage in textile exports to the United States, but suffer from elevated costs when exporting refrigerated goods to that market.

4. Corollary

Despite the notable recovery of international prices and international trade and the reduction of tariff protection that has favoured the region's trade activities in the past few years, the analysis reveals sufficient evidence that now that tariffs have come down, the trade system itself (represented and approximated in this study by shipping costs) has emerged as the new big barrier limiting the region's growth potential. This implies that the future development of the region's competitiveness in the global market will largely depend on the action taken to improve logistics in the region and to reduce the costs exporters currently incur when placing their products in foreign markets. Efforts in this area will make it possible to add value to local produce and bring down the by no means small (in some cases over 20%) mark-up on a product's unit value in its market of origin that shipping costs currently represent.

The tariff reductions the region now enjoys were achieved through negotiations that depended on the region's trading partners. Latin American and Caribbean governments and exporters can and should, however, spearhead the process to lower shipping costs in the region. Several companies have already begun to tackle shipping costs in different ways. Some basic commodities producers are even buying or leasing their own vessels⁶. Such measures are of course feasible for large enterprises, but greater coordination is required to take similar action that favours small and medium-sized enterprises (SMEs). This will, from now on, be



an important field of action for private and public-private alliances, because the steps taken or not taken now will directly affect a country's competitiveness in foreign markets and

determine its capacity to reduce the percentage that shipping costs represent in total export costs.

Methodology

The traditional equation for calculating the impact of shipping costs on FOB value rests on the supposition that the value of each product exported from country i to country j is the FOB value at i and the CIF value at j , and that the shipping costs are the difference between the two. Seasonal variations, transportation times, merchandise losses and duty free zones obviously skew and possibly undermine the validity of this methodology. It is, however, the only approximation possible, and the value thus obtained is therefore still highly relevant. Equation 1 shows the formula used: M is imports (CIF value); X is exports (FOB value); i and j refer to the countries of origin and destination, and k is the product in question.

$$\text{CIF versus FOB Ratio} = \left(\frac{M_{ji}^k}{X_{ij}^k} - 1 \right) * 100 \quad (1)$$

In order to reduce the margin of error in the ratio calculation, unit values of products taken from the broadest category possible according to SITC Revision 3 (up to 4 or 5 digits) were used. The methods of calculation vary as the cost is approximated through unit values on the basis of the value and the quantity reported in both ports. The use of the unit values constant mitigates the effects of seasonal variations and merchandise losses as differences in product prices rather than general values are taken into consideration. The formula is shown in equation 2, in which V represents the value and Q quantity. The other notations used refer to the same concepts as in equation 1.

$$\text{Unit Values} = \left(\frac{Vm_{ji}^k / Qm_{ji}^k}{Vx_{ij}^k / Qx_{ij}^k} - 1 \right) * 100 \quad (2)$$

The data were obtained from the United Nations COMTRADE database and then compared and contrasted with those reported by EUROSTAT in the case of the European Union, Japan Customs in the case of Japan, and USITC in the case of the United States, for corroboration or completion as required.

N.B.: The authors stress the provisional nature of the figures presented. They would also like to thank the entities and persons in the region who collaborated in the reconstruction of the shipping costs and urge all those interested or who could provide data or case studies that might extend and improve the analysis to please contact them.

Notes:

- ¹ MacMap (<http://www.intracen.org/mas/welcome.htm>). Tariffs applied ad-valorem (estimated) in 2004.
- ² Idem, ant.
- ³ J. Hoffmann, G. Pérez and G. Wilmsmeiner, "International Trade and Transport Profiles of Latin American Countries, year 2000", Manuales series, No. 19 (LC/L.1722-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), 2002.
- ⁴ J. Hoffmann and I. M. Sarzoso, "Costes de transporte y conectividad en el comercio internacional entre la Unión Europea y Latinoamérica", Cuadernos del ICE, No. 834, January-February 2007.
- ⁵ J. Hoffmann, "The cost of international transport, and integration and competitiveness in Latin America and the Caribbean", FAL Bulletin, No. 191, Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), July 2002; and G. Wilmsmeier, J. Hoffmann and R. Sánchez, "The impact of port characteristics on international maritime transport costs", Port Economics, Research in Transportation Economics, K. Cullinane and W. Talley (eds.), vol.16, Elsevier, 2006.
- ⁶ Wall Street Journal Americas "Las firmas de commodities encaran un reto nuevo" 22 October, 2007.

