Issue No. 221 – January 2005

RECENT INCREASES IN SHIPPING COSTS AND THEIR IMPACT ON EXPORTS FROM LATIN AMERICA

This issue of the FAL Bulletin is based on a study prepared by ECLAC which works out a provisional approach for estimating the impact of increases in freight rates on exports from Latin America during the last few quarters. The total cost of exports from the region reflects the increases in three different components: the quantities exported, the prices of the goods and the freight charges. The influence of each of these is estimated.

The information bases used are comprised of data obtained from the World Trade Organization (WTO), the United Nations Conference on Trade and Development (UNCTAD), the Economic Commission for Latin America and the Caribbean (ECLAC) (International Transport Database) and the authors' own direct compilation. The conclusion is that total exports from Latin America varied by US$ 5.72 billion in the first half of 2004 compared with the first half of 2003; of this amount, US$ 2,105,000,000 correspond to the variation in price and quantity and US$ 3,615,000,000 represent the increase in export freight rates. When compared with the first half of 2002, the variation is in excess of US$ 8 billion.

For further information, contact the authors: José Durán Lima: jose.duran@cepal.org or Ricardo J. Sánchez: ricardo.sanchez@cepal.org, officers in the Division of International Trade and Integration and Natural Resources and Infrastructure Division, respectively.

Figure 1: World export trends
(tasas de crecimiento promedio)
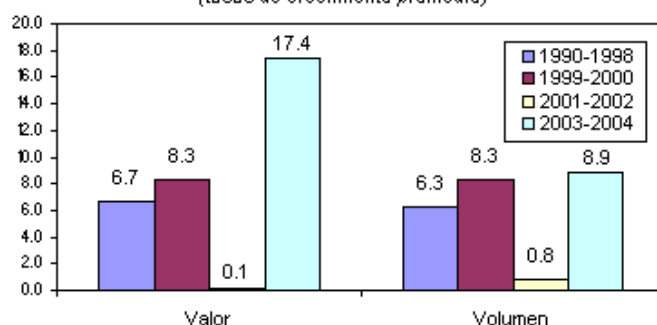
Source: Authors, on the basis of figures from the Department of Economic and Social Affairs (DESA). United Nations

Trends in trade. Global trade in goods recovered strongly in 2004, growing by 10.9%, following an expansion of close to 6.8% in 2003 and leaving behind the weak performance of the 2001-2002 biennium, when its average growth was scant both in volume and value in the wake of the world crisis of 2001; in that year, the explosion of the financial bubble associated with the excessive rise in stocks of information and communications technology companies had led to a dramatic fall in exports of manufactures, especially technological products.

The current expansionary trade cycle stems from the recovery in economic growth in some developed countries, especially the United States and Japan, as well as the constant increase in domestic demand in the South-East Asian countries and China, where demand buoyed up the prices of the main raw materials exported by Latin America and the Caribbean in the last biennium[1], especially soybean and cereals, fish meal, wool, wood pulp, iron ore, copper and oil.

Latin American trade in mining products was particularly brisk in 2004 with rises in excess of 40%.[2] Moreover, exports of manufactures and agricultural products increased by 21% and 11% during the same period. In

breaking down the main components of the increase in exports, it can be observed that approximately 50% corresponds to the increase in prices.

While private-sector exporters in many countries of the region are overjoyed at the increase in export volumes, they have had to face substantial rises in export-related costs, especially in the transport segment, insofar as the demand for storage has increased. In order to respond to this concern and open up the debate concerning the negative impact that the rise in freight rates has had on the competitiveness of exports, this Bulletin seeks to quantify the extent of that impact on the exports bill in a group of countries that are representative of the region.

Factors contributing to the rise in freight rates. In the last few quarters, the world has witnessed the convergence of two elements that have resulted in a generalized rise in freight rates and a scarcity in services in some regions, such as have rarely been seen in the past. These elements are: (a) a significant imbalance between the demand for, and supply of, maritime transport, due to steady growth in the former following a contraction in the latter; (b) a rise in critical costs, such as insurance, fuel, time charters and the purchase prices of new and used ships, among others.

Within the first group, one can observe a variation in the shipping capacity assigned to different trade routes, positive in some and negative in others. Such decisions reflect the transport requirements related to the growth in world trade in the context of a shortage of vessels and warehouses. Thus, some routes which are of secondary importance in the global context show variations in the assigned shipping capacity, which prove to be lower than the requirements, as is the case with various routes linking Latin America with other places of origin or destination. For example, there has been considerable growth in the supply on some of the world's main shipping routes: between June 2003 and May 2004, there was nominal growth of 1.5 million TEUs[3], a figure which largely exceeds the growth of the world fleet during the same period (from 7.1 million TEUs to 8.1 million TEUs). On this understanding, it may be understood that higher allocations on some routes may mean reductions on others.

Similarly, there was also a shortfall in the supply of transport for dry bulk goods compared with an expansion and geographic concentration of demand during much of the period under consideration. The factors leading to this situation on the demand side are related to the performance of some economies in the northern hemisphere and to a concentration of merchandise movements on north-north routes (originating in the north and bound for a destination in the north), with an impact on a greater demand for agricultural and mineral commodities.

In short, in the last few quarters, there was a gap between the increase in the demand for transport of cargo and the supply – represented by the total transport capacity of the world fleet – following a period of oversupply of vessels linked to a more or less generalized reduction in freight rates. This is the situation which shifted radically between 2001-2002 and early 2003, when the prospect of a more sustained demand trend started to upset the precarious balance that had existed between supply and demand. A variation in supply from 2003 was insufficient to meet demand, which resulted in an increase in freight rates.

These imbalances, combined with evidence of increases in the cost of constructing new vessels and of time charters, which reflect a shortfall, suggest that we are dealing with a phenomenon akin to the cattle cycle or cobweb cycle, in which the quantity supplied is a function of the price in the foregoing period or periods. There is a lack of simultaneity of production –reacting to the price (freight) incentive– responsible for the supply being low during the high price period and the quantity supplied becoming excessive some time later, causing a fall in prices and oversupply. Faced with a low-price situation (low freight rates), in the maritime sector, fewer ships are constructed and a greater number are scrapped. When demand for transport services increases, the supply (in terms of the number of ships and/or availability of effective transport capacity) cannot respond rapidly, freight rates rise and construction is restarted, causing a subsequent oversupply, reduction in freight rates, and so forth.

The second element contributing to imbalances between supply and demand is the evidence of increases of critical costs for shipping activity, since the prices of the new or used vessels or those under construction, as well as the cost of time charters, bunker oil and insurance increased sharply. In addition, new measures for port and shipping security and protection have gradually been introduced and imply additional costs.

Between 2002 and June 2004, the cost of constructing new container vessels increased by between 22% and 104%, depending on the size and characteristics of the vessel. Bulk carriers, which played an important role for Latin American exports, cost up to 12% more by the end of 2003 and up to 48% more by June 2004.

In terms of the different transport capacities, the cost of time charters of container vessels increased by

between 31% and 93% between 2002 and 2003 and continued to soar (by a further percentage of between 24% and 68%) during the first half of 2004. Charters of bulk carriers, which had shot up by between 67% and 120% more between 2002 and 2003, saw further price increases of between 13% and 75% in 2004. In addition, on the market for tankers for the bulk transport of oil and oil products, substantial price increases were recorded both for construction and charters. Similarly, insurance and fuel costs trended upwards in line with market characteristics and general conditions, such as armed conflicts. Insurance rose by up to 50% in extreme cases, while fuels followed oil trends.[4]

As a result of the combined action of the abovementioned factors, the imbalances between supply and demand and the increases in the inputs of the activity, freight rates have risen spectacularly since the beginning of 2003. Considering only the period up to the end of 2003, container freight rates had increased by between 18% and 30% in Latin America and up to 27% on the main trade routes.

In the course of the first half of 2004, regular freight rates, under conditions similar to those mentioned above, continued their upward trend, averaging a rise of 39% in Latin America at the beginning of the second quarter compared with June 2003, with peaks of up to 65% on some major routes for Latin America. The freights for non-regular transport of dry cargo followed an even more extreme trend, that was totally unprecedented: considering the low cycle of prices (in mid-2002), freight rates increased six-fold in the extreme cases at the beginning of February 2004.

Changes in transport costs of exports from Latin America. Between January-June 2003 and the same period of 2004, the impact of shipping costs (the ratio of the cost of shipping to total exports) increased by 38.6%. Figure 2 shows the variations of this impact in the subregions.

Figure 2: LATIN AMERICA (17 COUNTRIES) AND SUBREGIONS: CHANGES IN THE

IMPACT OF THE COST OF TRANSPORT (JANUARY-JUNE OF EACH YEAR)

(Index numbers: January-June 2002=100)
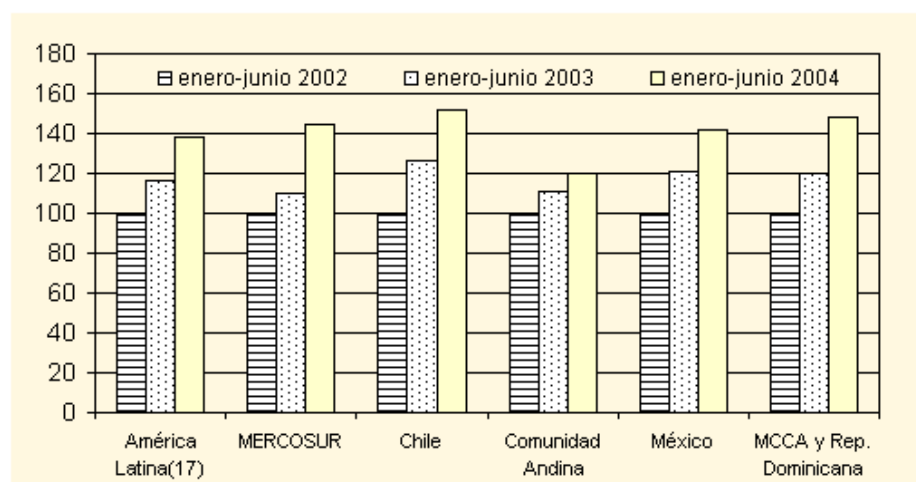
Latin America   Mercosur Chile Andean Community Mexico CACM and Dominican Rep.

Source: ECLAC, on the basis of information provided by the respective countries, commodity and transport prices (soybean, iron ore, oil and merchant freight rates).

a Index numbers calculated on the basis of the coefficient of the value of transport in total exports.

Expressed in terms of values, the highest rises in shipping costs meant a disbursement of US$ 18.4 billion for Latin America, that is, an additional amount of US$ 5.72 billion during the first half of 2004, compared with the same period of 2003, when the region paid out approximately US$ 12.68 billion. In analysing these increases, one must take into consideration other factors that affect the increase in total transport costs, basically those relating to the increase in export volumes, produced by the significant increases in volume in 2003 and 2004. To determine the rise attributable only to freight rates, the freight component was isolated from the volume component and prices, by

applying the simple assumption that freight rates have remained constant at the January-June 2002 level (see note on the methodology used at the end of this issue).

The freight component resulting from the exercice referred to above is estimated at around US$ 3,615,000,000 for the whole region, that is 63% of the total increase of US$ 5,720,000,000, referred to earlier with the peculiarity that this increase meant that it was almost double that recorded in the first quarter of 2002, when the shipping bill amounted to US$2,683,000,000 (see table 3).

Table 3: LATIN AMERICA (17 COUNTRIES): DISAGGREGATION OF THE INCREASE IN TRANSPORT COSTS

(Absolute variation in millions of dollars, broken down into volume effect and price, and the increase in freight)

	2002 (January-June)			2003 (January-June)			2004 (January-June)		
	Total increase[a]	Volume and price effect[b]	Freight effect[c]	Total increase[a]	Volume and price effect[b]	Freight effect[c]	Total increase[a]	Volume and price effect[b]	Freight effect[c]
Latin America (17 countries)	**2 683**	**764**	**1 919**	**3 619**	**875**	**2 744**	**5 720**	**2 105**	**3 615**
MERCOSUR	873	556	317	1 545	439	1 106	2 062	763	1 299
Chile	157	50	107	294	66	228	408	118	291
Andean Community	279	3	276	616	159	457	1 058	600	458
México	1 021	39	981	857	136	721	1 829	602	1 227
Central American Common Market and the Dominican Republic	354	116	238	308	75	232	362	22	341

Source: ECLAC, on the basis of information from the respective countries, prices of commodities and transport (soya, iron, oil and merchandise freight rates).

a. Difference in the value of exports compared with the previous period. b. This estimate was based on the assumption that freight rates remained constant over time at the levels recorded in the first half of 2002. c. The result was obtained by deducting the volume effect from the total value. In this way, the portion corresponding to the exclusive rise in freight rates was broken down. The estimate of the regional value broken down into the volume effect and the freight rate effect stems from the addition of the value of each one of the subregions in Latin America. For purposes of simplification, in order to compensate for the scarcity of information, trade in the region was grouped into broad families of products, such as oil and oil products, agricultural commodities, minerals and manufactures. Similarly, trade flows were concentrated in the main flows between the region and the rest of the world, assuming those transport costs. The transport costs were estimated on the basis of the following criteria: (a) for the transport of oil and oil products, the data on freight and insurance of transactions with the United States, as reported by the Department of Energy, were taken and used as proxy values for those for Latin America; (b) for freight rates for agricultural and mineral commodities, market values for the base year (first half 2002) were taken and adjusted using the Baltic Dry Index; (c) for manufactures, average market information for each of the half-years were taken and unit values were calculated taking the transactions reported for the whole of 2002 by the 11 countries registered in the ECLAC International Transport Database (BTI) as representative of the exports of manufactures from the region, thus obtaining an approximate updated cost for the transport of manufactures throughout the half-years analysed. A detailed explanation of the methodology is given in the final box of this note.

The authors wish to emphasize that the figures given are only provisional. At the same time, they thank the entities and individuals in the region who collaborated in the reconstruction of the values of the freight rates used. In view of the importance that the problem of the rise in freight rates has assumed for Latin America, they urge those interested to contact them in order to deepen and further the analysis by providing comments, data and case studies. Kindly send information to either of the following e-mail addresses: ricardo.sanchez@cepal.org or jose.duran@cepal.org.

METHODOLOGY USED

The calculation is based on the breakdown of the total cost of the export bill - referred to hereinafter as TC for a representative country as defined in equation (1)

$$XFOB_i = \sum_{m=1}^{n} p_{ijm}q_{ijm} \qquad (1)$$

Since the CIF value of exports is not available for the countries of the region, it was estimated by using the impact of the freight per ton, as expressed in the following equation:

$$TC_i = \sum_{m=1}^{n}\sum_{j=1}^{n} p_{ijm}q_{ijm} + \sum_{m=1}^{n}\sum_{j=1}^{n} p_{ijm}q_{ijm}f_{im} \qquad (2)$$

where p = price of exports; q = quantities exported; f = iimpact of the value of the freight on exports per ton; i = country of origin; m = type of merchandise; j = country of destination.

It should be noted that the value TC_1 is a good *proxy* for the CIF value of the exports. Therefore, the total cost of transport for country *i* will be equal to the difference between equations (2) and (1):

$$Transport\ cost_i = TC_i - XFOB_i \qquad (3)$$

The total value of regional transport is equal to the aggregate of the values for all the countries of the region. As the idea is to obtain the freight component of the total value, that component is isolated as follows:

If we take equation (2), and introduce the time element, we can obtain the increase in the total cost of exports from country i during the period t by applying the following equation:

$$\Delta TC_i^t = \left(\sum_{m=1}^{n}\sum_{j=1}^{n} p_{ijm}^t q_{ijm}^t + \sum_{m=1}^{n}\sum_{j=1}^{n} p_{ijm}^t q_{ijm}^t f_{ijm}^t \right) - \left(\sum_{m=1}^{n}\sum_{j=1}^{n} p_{ijm}^{t-2} q_{ij}^{t-2} + \sum_{m=1}^{n}\sum_{j=1}^{n} p_{ijm}^{t-2} q_{ijm}^{t-2} f_{ijm}^{t-2} \right) \qquad (4)$$

where t is the current half-year; and t-2 is the equivalent half-year in the preceding year. It should be noted that all the components —price, quantities and freight charges— have varied over time. In order to isolate the freight effect from the variation in the total cost (ΔTC_i^t), the exercise consisted in recalculating ΔTC_i^t, bearing in mind the impact of the prices during the half-year *t-4,* that is, the level of prices existing before the effective rise in freights under consideration occurred. This implied using the value of the impact of the freight charges during the first half 2002 (t-4), thus obtaining equation (5):

$$\overline{\Delta TC_i^t} = \left(\sum_{m=1}^{n}\sum_{j=1}^{n} p_{ijm}^t q_{ijm}^t + \sum_{m=1}^{n}\sum_{j=1}^{n} p_{ijm}^t q_{ijm}^t \overline{f_{ijm}^{t-4}} \right) - \left(\sum_{m=1}^{n}\sum_{j=1}^{n} p_{ijm}^{t-2} q_{ijm}^{t-2} + \sum_{m=1}^{n}\sum_{j=1}^{n} p_{ijm}^{t-2} q_{ijm}^{t-2} \overline{f_{ijm}^{t-4}} \right) \qquad (5)$$

Equation 5 gives the result of the increase in the costs bill, at constant freight levels, so that it only records the combined increase in the prices of goods plus its volume. By subtracting equation (5) from equation (4), we obtain the increase in freight charges for country i. Thus:

$$\Delta F_i = \Delta TC_i^t - \overline{\Delta TC_i^t} \qquad (6)$$

Lastly, in order to obtain an overall estimate for quantifying the increase in freight for all the countries of the region, the results of individual countries were added as follows:

$$\Delta F_{LAC} = \sum_{i=1}^{n} \Delta F_i \cdots\cdots with \cdots n = 17 \qquad (7)$$

---

[1] For example, judging from just the changes in the trade in soybean, coal, iron and the loads per container, it is estimated that volumes shipped to China increased by at least 167 million tons between 2002 and 2003.

[2] Information disaggregated by broad sectors up to September 2004 reveals that the increases in the export value of mining products exceeded 30% in ten countries of the region: Brazil, Uruguay, Chile, Bolivia, Ecuador, Peru, Venezuela (Bolivarian Republic of), Honduras, Nicaragua and Dominican Republic.

[3] TEU stands for twenty-foot equivalent units and is the standard unit of measurement for accounting for different types of containers.

[4] For futher details on these issues, see Sánchez, Ricardo J. "Puertos y transporte marítimo en América Latina: un análisis de su desempeño reciente", Recursos naturales e infraestructura Series No. 82, ECLAC, Santiago, in http://www.eclac.cl/dmi.