Box 2
Analysis of Recent Disturbances in Global Logistics Chains and their Impact on Colombian Import Markets

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This box analyzes the price increase in Colombian imports during the first months of 2021, which reflects different tensions in global markets. Specifically, two sources of price pressure were identified. On the one hand, there have been extraordinary disruptions in the global logistics chains that have led to increases in transport costs. On the other hand, there have been increases in the prices of certain goods, in particular the prices of intermediate goods used by the manufacturing and agriculture sectors.

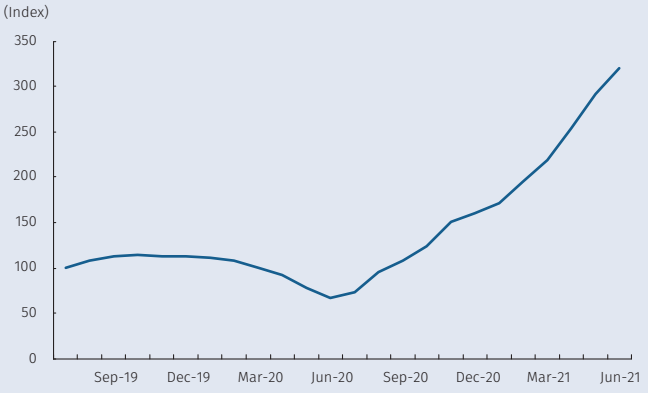
The first part of the text focuses on the global environment and discusses the various factors that have caused extraordinary increases in logistics costs. The second part examines the price increases of Colombian imports, which reflect these increases in transport costs, but also reflect substantial increases in the underlying net prices of imported goods, in particular intermediate goods. Estimates indicate that the impact of this shock on the costs of the country's manufacturing and agriculture firms lies between 3.0% and 5.0% of their production costs.

1. The Global Situation

In the past year, the increase in the volume of the international trade of goods has been accompanied by a significant increase in maritime transport costs. Graph B2.1 shows the Harpex index of global container transport costs as of June 2021. The index shows a 380% growth from its lowest point in June 2020, and a 100% growth throughout 2021. This substantial increase in maritime transportation costs has been driven by both demand and supply factors.

On the one hand, there has been an increase in the global demand for goods. According to the United Nations Conference on Trade and Development (UNCTAD, 2021) and the Organization for Economic Cooperation and Development (OECD, 2021), factors that could explain these dynamics include the recovery of the world economy, the recomposition of consumption patterns toward durable goods and e-commerce, the recovery of demand that was contained by quarantines, government support to household incomes, and the restoration of inventories by firms, among others. This has been reflected in the strong recovery of global trade of goods. As can be seen in Graph B2.2, real exports and global container traffic have grown steadily in 2021, in particular exports from Asia. This recovery of trade followed the sharp fall observed during the second quarter of 2020 and has taken place faster than expected. A significant part of these goods is transported by sea, leading to port congestion and shortages of containers.

Graph B2.1
Harpex Index for Global Maritime Transport Costs



Source: Harper Petersen (harpex.harperpetersen.com).

On the supply side, the expansion of installed transportation capacity faces rigidities, and bottlenecks and delays have been experienced in the logistics chains due to health restrictions and measures to contain the Covid-19 virus. For example, the port of Yantian, which is very important to global trade and close to China's manufacturing center, has been affected in its operation in recent months due to outbreaks of Covid-19, which resulted in disruptions in maritime transport logistics in that country and internationally as well. Additionally, following the wave of Covid-19 infections in India, it has been reported that several ports in different countries introduced restrictions on ships and crews from that country, from where a significant proportion of crew members of transnational vessels are native. Added to this was the blockade in the Suez Canal due to the stranding of a large vessel. This, together with increased demand for shipping services, has led to increased cargo transit and waiting times at ports, delays in established timetables, and a shortage of containers. These dynamics has taken place in a highly concentrated industry, in which 80% of the market is controlled by the ten largest shipping companies through multiple commercial alliances (The White House, 2021).

Price increases, higher demand, and supply disruptions have also been observed in the markets for manufactured goods and raw materials, including food markets (see Box 3 of this Report). The manufacturing sector has faced increased delivery times of inputs required for the production processes. According to the Institute of International Finance (IIF), in 2021 these waiting times are above their historical average and increasing, and have been accompanied by higher prices of inputs and final products. The

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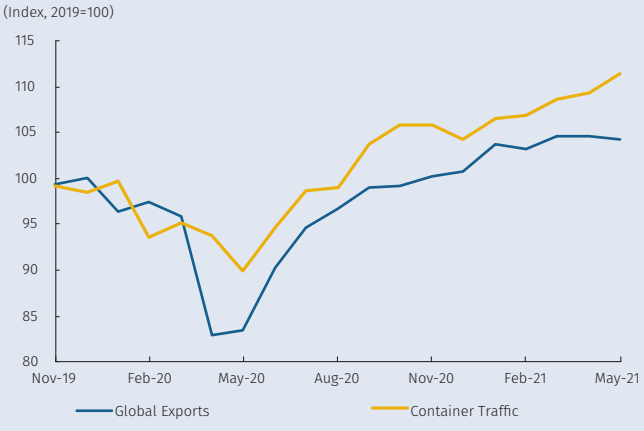
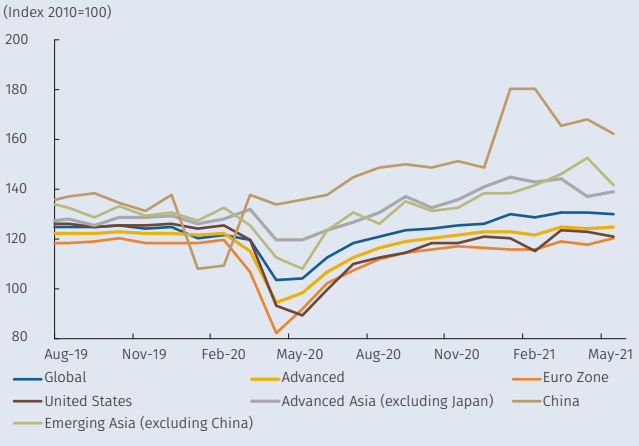
Graph B2.2
Real Exports and Container Traffic

A. Real Global Exports and Container Traffic



B. Real Exports by Region of Origin



Sources: Institute of shipping economics and logistics, CPB Netherlands Bureau for Economic Policy Analysis, and Bloomberg.

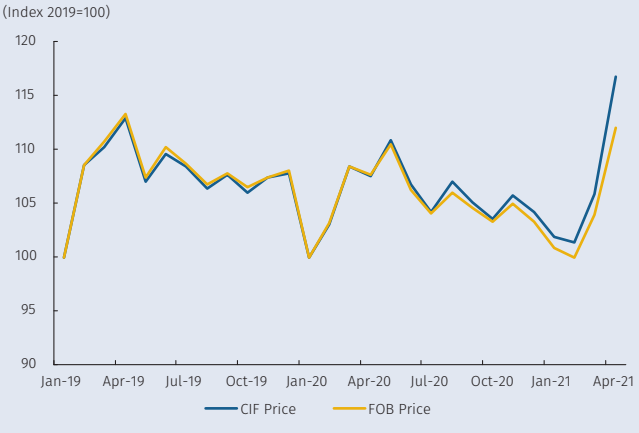
case of semiconductors (microchips), used in multiple products such as computers, cell phones and automobiles, stands out. In the case of the United States and according to analysts and specialized agencies, the scarcity of this input hinders the recovery of economic activity. Moreover, in June, insufficient production of new cars using these semiconductors would have contributed to the maximum monthly increase in all history of the CPI component associated with trucks and used vehicles (10.5%), thus contributing to more than one third of the monthly total CPI change in the United States (0.9%).

2. The Prices of Colombian Imports

The price increase of Colombian imports, caused by increases in logistics costs and international prices of intermediate goods, is shown below. Graph B2.3 shows a US dollar price index of the Colombian imports, based on their 2019 composition and using the prices implied by the CIF and FOB values per volume of the country's monthly import records until April 2021. As shown, the aggregate price of all imports is volatile and has shown a rebound so far in 2021; however, its recent increase is comparable with the increase observed early in 2019. Secondly, since 2020, there has been an increasing gap between the CIF price (which includes logistics costs to Colombian ports of entry) and the FOB price, which is the price at the port of origin.

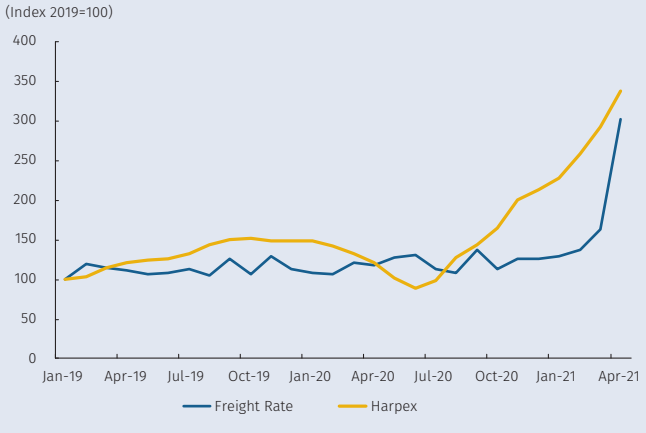
Graph B2.4 specifically shows the transport cost index (calculated as the difference in trade values by volume, CIF – FOB), using the same fixed basket of imported goods as in 2019 and the Harpex index of global logistics costs shown in the previous section. As shown, the increase in the costs of logistics for Colombian imports is similar to their global increase and should therefore be the result of the sup-

Graph B2.3
Price Indexes in CIF and FOB Dollars for Colombian Imports



Sources: DANE and DIAN; calculations by *Banco de la República.*

Graph B2.4
Implicit Transport Cost Index and Harpex Index of Overall Container Transport Costs



Sources: DANE, DIAN, and Harper Petersen and Co. (HARPEX); calculations by *Banco de la República.*

ply and demand factors discussed in the previous section. Note that, despite the increase in the costs of logistics, the bulk of the observed variation in the price of imported goods comes from their FOB values, which do not include direct transport costs from the country of origin. Moreover, it can be seen that the increase observed in the aggregate price index in 2021 reflects, in part, a reversal of declines observed in 2020, and is comparable with the increase observed in 2019.

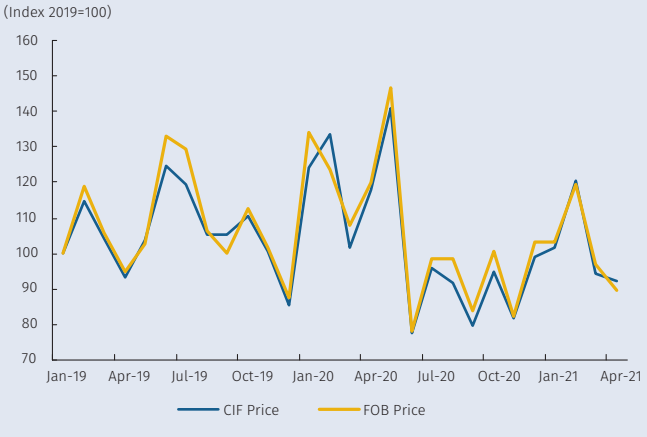
The increase in prices differs depending on the type of imported product: consumer goods, intermediate goods, capital goods, and others (labeled "miscellaneous"). As can be seen in Graph B2.5, the phenomenon of price increases throughout 2021 is concentrated in intermediate goods, whose price index reaches a much higher level in March and April than the average of the last two years. Besides, the increase in freight costs, given by the difference between the CIF and FOB values, is much higher for intermediate goods. Consumer goods and capital goods, on the other hand, show an increase in prices in the last month of the sample, but their level remains comparable to their recent historical average.

Graph B2.6 shows the evolution of US dollar price indexes (base 2019) for the three most important types of intermediate goods: fuel, intermediate goods for agriculture, and intermediate goods for manufacturing. Increases in fuel prices are attributable to the increase in the price of oil, and to some extent reflect a reversal of the decreases observed since 2019. On the other hand, substantial price increases in intermediate goods for agriculture and manufacturing and their recent levels (which are historically high) stand out. There is also a high increase in the transport costs of intermediate goods for manufacturing.

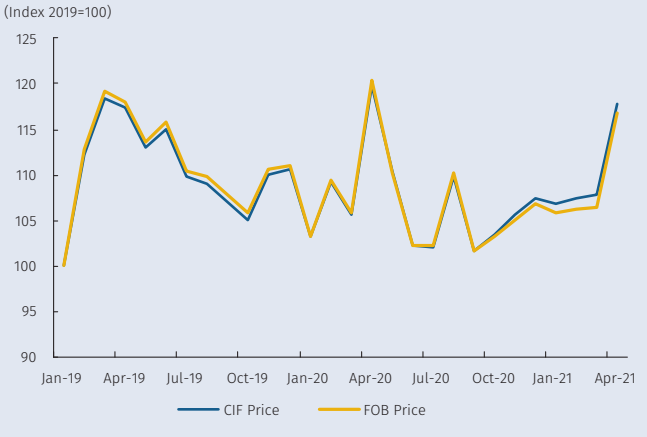
Given the price inflation of imported intermediate goods, the behavior of their prices was inspected at a two-digit product level. For this purpose, Graph B2.7 shows, on the horizontal axis, the inflation in FOB dollars between December 2020 and March 2021 by type of input, and, on the vertical axis, its share in total imports of inputs for industry or agriculture. As shown, most of the points are located to the right of the zero-inflation level. Besides, it may be noted that this inflation is not skewed by any particular product; rather, it occurs for all types of products with different weights in total imports.

Graph B2.5
Dollar Price Indexes of Imports by Product Type

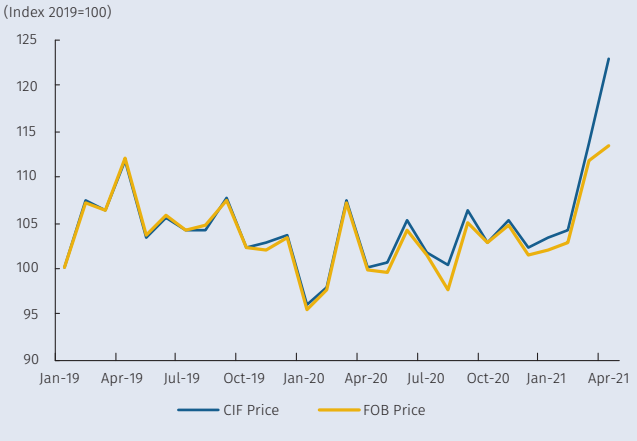
A. Miscellanea



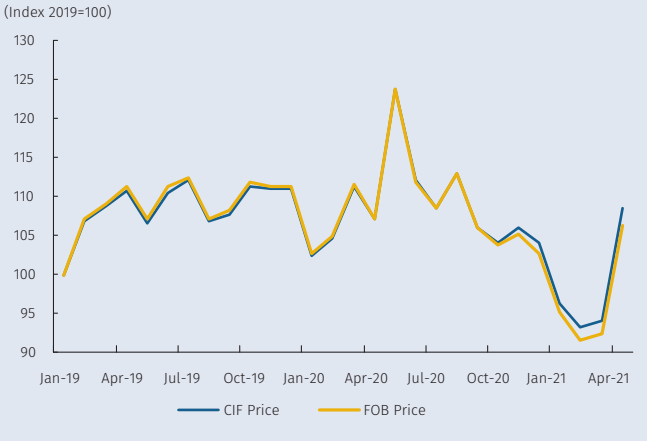
B. Consumer Goods



C. Intermediate Goods



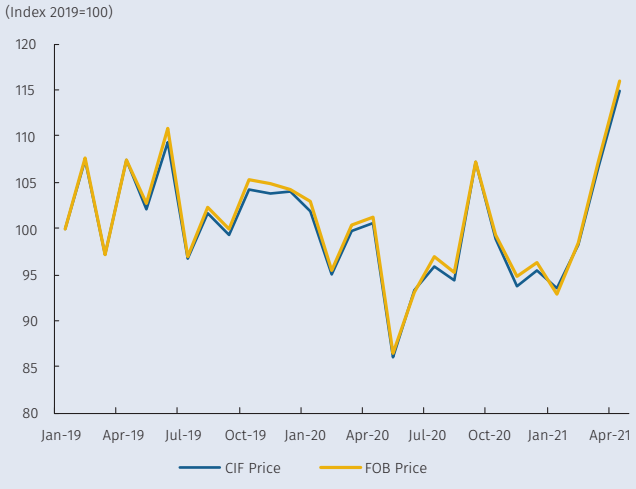
D. Capital Goods



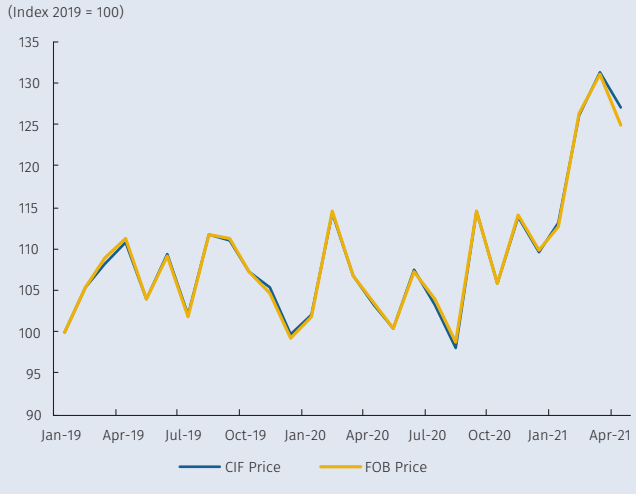
Sources: DANE and DIAN; calculations by *Banco de la República*.

Graph B2.6
Dollar Price Indexes of Intermediate Goods by Product Type

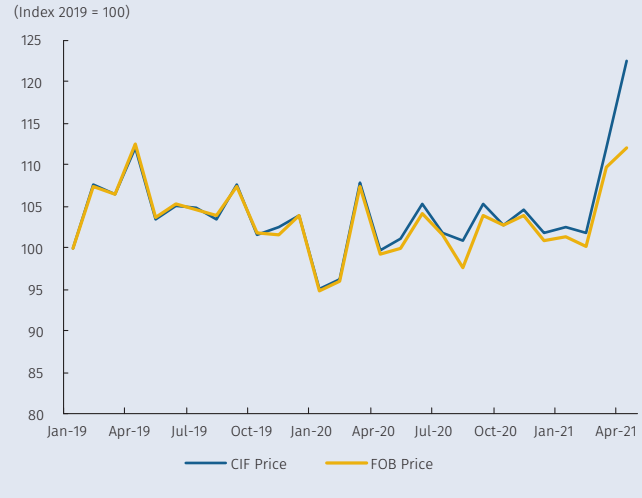
A. Fuel, lubricants, and related products



B. Raw Materials and Intermediate Products for Agriculture

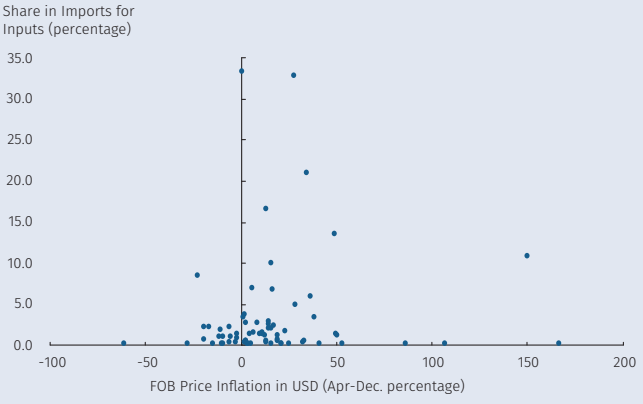


C. Raw Materials and Intermediate Products for Manufacturing



Sources: DANE and DIAN; calculations by *Banco de la República*.

Graph B2.7
Share of Inputs in Total Imports (from the agricultural or manufacturing sector) *vs.* FOB Price Inflation (USD, Dec-20 to Apr-21)

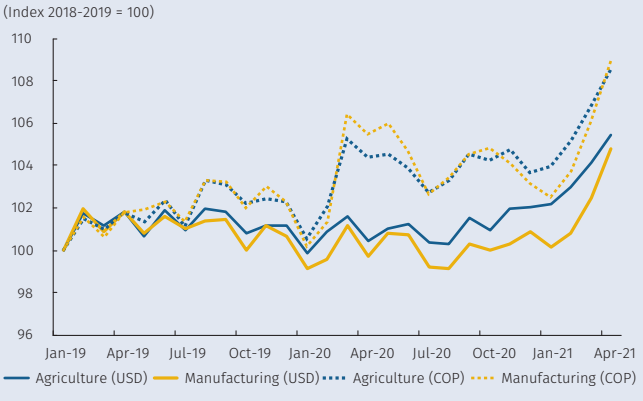


Sources: DANE and DIAN; calculations by *Banco de la República*.

To illustrate the potential impact of inflation on imported input prices, an index was calculated to measure the impact of the costs of imported goods on the total costs of the manufacturing and agriculture sectors (Graph B2.8). To obtain this index, domestic costs and the demand of imported inputs were assumed to remain constant, based on the 2018 national accounts 2019 imports. In other words, the index measures the average costs of agriculture and manufacturing, assuming that everything else remains constant, except for the costs of imported inputs, which are supposed to change over time according to the variation identified for the data of imported goods by product. Two versions of this index were calculated for each sector: one in which the exchange rate was assumed to be constant and another in which it was adjusted according to the representative exchange rate (TRM) for each period. This difference allows the effect of international dollar prices to be isolated from fluctuations in the nominal exchange rate.

As can be seen in Graph B2.8, the cost indexes in pesos (illustrated with dotted lines) show an increasing trend over the past two years, with an accumulated growth of more than 8.0% since January 2019. On the other hand, indexes in US dollars (illustrated with solid lines) were more or less stable until early 2021. Since then, their increase is simi-

Graph B2.8
Impact Indexes for Import Costs on the Total Costs of Agricultural and Manufacturing Firms



Sources: DANE and DIAN; calculations by *Banco de la República*.

lar to the increase in the international price of imported inputs described in previous graphs. That is, the cost increase observed in 2020 was mainly due to the change in the exchange rate, while the cost increase in 2021 has been due more to increases in dollar import prices.

So far in 2021, the cost indexes in pesos for agriculture and industry have grown by 4.0% and 5.2%, respectively. Please note, however, that the increase observed in the first months of this year is comparable to that observed during the first months of 2020. However, the annual inflation of this cost index for agriculture and industry from April 2020 to April 2021 is 3.2% and 2.9%, respectively. It is worth reiterating that the recent increase has been caused by the increase in global prices, and that this trend could still be prolonged over the next few months, as stated in the previous section.

3. Final Comments

So far in 2021, there has been a significant increase in the costs of Colombian imports due to increases in their prices and in international transport logistics costs. The increase in logistics costs has resulted from capacity constraints on the global cargo infrastructure as well as from demand spikes related to the recomposition of consumption of goods and services during the pandemic. On the other hand, there have been increases in net transport cost prices that reflect additional supply and demand pressures in global markets.

The increase in import prices is noticeable in the prices of inputs for agriculture and manufacturing, with an estimated impact of about 3.0% on their average production costs over the past year. This calculation does not consider any additional effects related to the law-and-order situation in the country.

The observed increase in prices and its impact on domestic production costs are not negligible and will have to be monitored in the coming months. Until now, their effect has been heterogeneous across products and sectors, but their aggregate effect will depend on their evolution in the coming months and on the transmission mechanisms to the rest of the economy.

On the other hand, the underlying component of the prices of traded goods is the result of supply and demand forces, which are subject to aggregate and policy shocks that are difficult to predict. On the supply side, economies are still exposed to uncertain pandemic developments that could continue to affect global supply chains due to the impact of the virus on workers and the imposition of health measures to contain it. On the other hand, increasing the installed capacity of the manufacturing and transport sector in order to respond to the increased demand for goods requires large investments whose results would not be fully observed in the short term.

On the demand side, there are also risks associated with the evolution of the pandemic. In terms of demand for consumer goods, the recovery observed in the short term may slow down as the relative demand for services recovers. Finally, there is also uncertainty about the persistence of the effects of fiscal support to families, which have been a key driver of recovery in some of the world's largest economies.

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