Pathways to integration

Trade facilitation, infrastructure, and global value chains

Executive Summary

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CAF DEVELOPMENT BANK OF LATIN AMERICA

2021 RED Report on Economic Development

Regional integration and the international insertion of Latin American firms

Economic openness and a greater participation of firms in international trade flows promote higher levels of productivity and welfare. Moreover, the possibility of expanding production beyond the limits of domestic markets enables economies of scale and a greater specialization or diversification into new products. This process is strengthened by the opportunities for firms to take part in global value chains, which also promote technology and knowledge spillovers and facilitate access to critical inputs to support productive diversification and specialization.

Most countries in the region have unilaterally and multilaterally adopted and implemented trade liberalization policies over the last 30 years, in the context of trade agreements reached within the region and with extra-regional partners. Although on average these policies have generated increases in trade and investment for the region, their results have been rather modest. In fact, the region's participation in global exports has not changed substantially and the impact on growth does not match countries' expectations when implementing them.

One reason for this is that these liberalization policies did not generate significant and sustained increases in intraregional trade, which has remained at around 15% of total exports since the mid-1990s, with little variation over time. In contrast, when looking at the high levels of participation in global trade in other regions, like East and Southeast Asia, Europe, or North America, the regional component of these flows is a critical aspect. For example, intraregional trade accounts for almost 60% of total trade in Europe, while in North America it reaches 45%, and in East and Southeast Asia, 35%.

Even taking into account structural differences like the smaller size of their economies, which would explain Latin America's lower levels of intraregional exchange of goods and services, the countries of the region trade little with each other. In the region, geographic proximity does not seem to have had a significant impact in terms of lower trade costs, as is seen in other regions and blocs that boost trade between neighboring economies.

What have been the causes of this poor performance? What aspects of international trade costs have not been duly addressed by the negotiations carried out in recent years? To what extent is this low level of trade also related to the region's low participation in global value chains? What regulatory policies could be applied to promote greater integration of the different productive sectors in the region? What are the institutional conditioning factors that affect the progress of a policy agenda for greater regional and global integration?

This report attempts to answer these questions by exploring the hypothesis that the low participation of Latin American firms in international trade flows is due in part to the limited use of the regional space as a complement to a strategy of global export (and import) expansion. This hypothesis focuses on the feedback effects and benefits between regional and global openness, or what has been called «open regionalism». These feedback effects are determined by the fact that when generalized tariff reduction processes are undertaken, as seen in several countries in the region in the late 1980s and early 1990s, lower transportation and logistics costs induced by geographical proximity become more relevant. This naturally boosts trade between neighboring economies, which, in turn, creates incentives to further reduce tariffs and other barriers to regional trade, like non-tariff barriers (e.g., the standardization of phytosanitary requirements), and promotes trade facilitation measures, like the simplification of border procedures. It also encourages investment in infrastructure that enhances the benefits of geographical proximity. These measures encourage productive linkages between neighboring countries and, to an even greater extent, foster the trade of regional goods, as in the case of energy.

Many of these trade liberalization initiatives are established in the context of free trade agreements (FTAs) that ensure reciprocity (and stability) in market access. Physical proximity and better identification of the benefits that these actions can produce in the participating economies and territories facilitate the coordination of these policies between States and the signing of these agreements. This reciprocal exchange of liberalization measures, in turn, is reinforced by pressure from exporting sectors that benefit from these actions. In this way, regional integration spaces or «natural blocs» are created, where the different measures to reduce trade cost, both unilateral and preferential, reinforce each other, maximizing the gains from trade creation and minimizing the losses from trade diversion (Ethier, 1998; Frankel, 1997; Garriga and Sanguinetti, 1995a, 1995b; Krugman, 1991).[1]
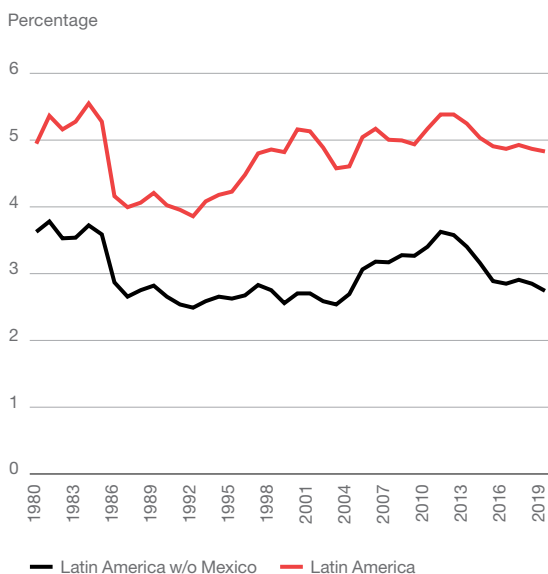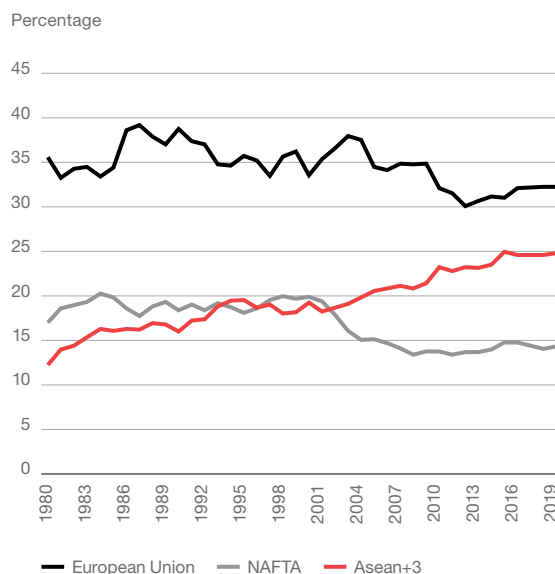
The evolution of global and regional trade

Latin America has not made significant progress in its involvement in international trade flows in recent decades. As a result, its share in global exports has not changed, remaining at values of between 4% and 5%, although this performance is partly explained by Mexico's integration with its northern neighbors. If Mexico is not included in the region, Latin America's export share falls by 1 percentage point, from approximately 4% to 3%, as shown in Graph 1. This stagnation contrasts with significant increases in the share of other developing regions, like East and Southeast Asia,[2] which, driven by China, increased its share in global exports from 12% to 25%.

1. Welfare gains from «trade creation» occur when increased imports from countries that are members of a trade agreement replace higher-cost domestic production. On the other hand, welfare losses from «trade diversion» occur when preferential tariff reductions encourage imports from within the region to replace more efficient imports (at lower costs, excluding tariffs) from third-party countries.

2. East and Southeast Asia corresponds to the member countries of the Association of Southeast Asian Nations (Asean), which are Burma, Brunei, Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam, plus China, South Korea, and Japan (Asean+3).

Graph 1

Participation in global exports of goods and services,
by region or trade bloc, 1980-2019

Panel A. Latin America

Percentage

— Latin America w/o Mexico   — Latin America

Panel B. Benchmark regions

Percentage

— European Union   — NAFTA   — Asean+3

Notes: The graps show the share of world exports of goods and services over the total in Latin America (panel A) and the different regions or trade blocs. (panel B).
Source: Authors using the WTO and UNCTAD database (2020).

This assessment of the relative stagnation of Latin America's participation in world markets does not change significantly when evaluated in terms of the ratio of exports to gross domestic product (GDP). On average, this ratio in the region rose moderately over the 30+ years between 1980-1984 and 2015-2018, although the results show great heterogeneity among countries. Table 1 presents this information, along with the import and total trade indicators. In South America, Paraguay stands out. It almost tripled its level of exports relative to GDP (from 13% to 37% of GDP). Other countries that were initially more open, like Chile and Uruguay, also increased their external shipping of goods and services (relative to the overall economic activity), although much more moderately. Like Brazil, Argentina raised its exports to GDP ratio, but its levels still remained very low at the end of the period. Among the Andean countries, Ecuador shows an outstanding performance, almost doubling its exports to GDP ratio, while Peru and Colombia display more modest increases. In the latter case, the relatively low level of the indicator is noteworthy (only slightly higher than that of Argentina and Brazil). Central American economies are much more open, which in part is expected for smaller economies but the strong increase in trade to GDP in the case of Honduras, Nicaragua, and El Salvador is striking. Finally, an exceptional case is undoubtedly Mexico, which recorded a remarkable increase (almost tripling) in the level of internationalization of its economy.

Table 1

Trade openness in Latin America by country (as a percentage of GDP)

Country	1980-1984			2015-2019		
	Exports	Imports	Total trade	Exports	Imports	Total trade
Argentina	8	6	14	13	14	28
Barbados	57	58	116	42	41	83
Bolivia	26	25	51	26	33	59
Brazil	10	9	19	13	13	27
Chile	20	24	44	28	28	57
Colombia	12	14	27	15	21	37
Costa Rica	37	40	77	32	32	64
Ecuador	16	16	32	21	22	44
El Salvador	26	31	57	29	46	75
Guatemala	16	19	35	19	28	47
Honduras	27	37	64	42	60	102
Mexico	14	10	24	37	39	77
Nicaragua	20	34	54	42	54	95
Panama	55	59	115	43	47	90
Paraguay	13	19	32	37	33	70
Peru	21	21	42	24	23	47
Dominican Republic	19	28	48	24	28	51
Trinidad and Tobago	48	51	99	41	43	85
Uruguay	19	20	40	26	22	48
Venezuela	27	22	49	n.a	n.a	n.a
Latin America	25	27	52	29	33	62

Notes: The table shows the average trade openness from 1980-1984 and 2015-2019 for the different countries, measured as the percentage in GDP of their exports, imports, and total trade level. The values for Latin America correspond to the simple average of the countries presented in the table (including Barbados, Dominican Republic, and Trinidad and Tobago); n. a. indicates no data was available.
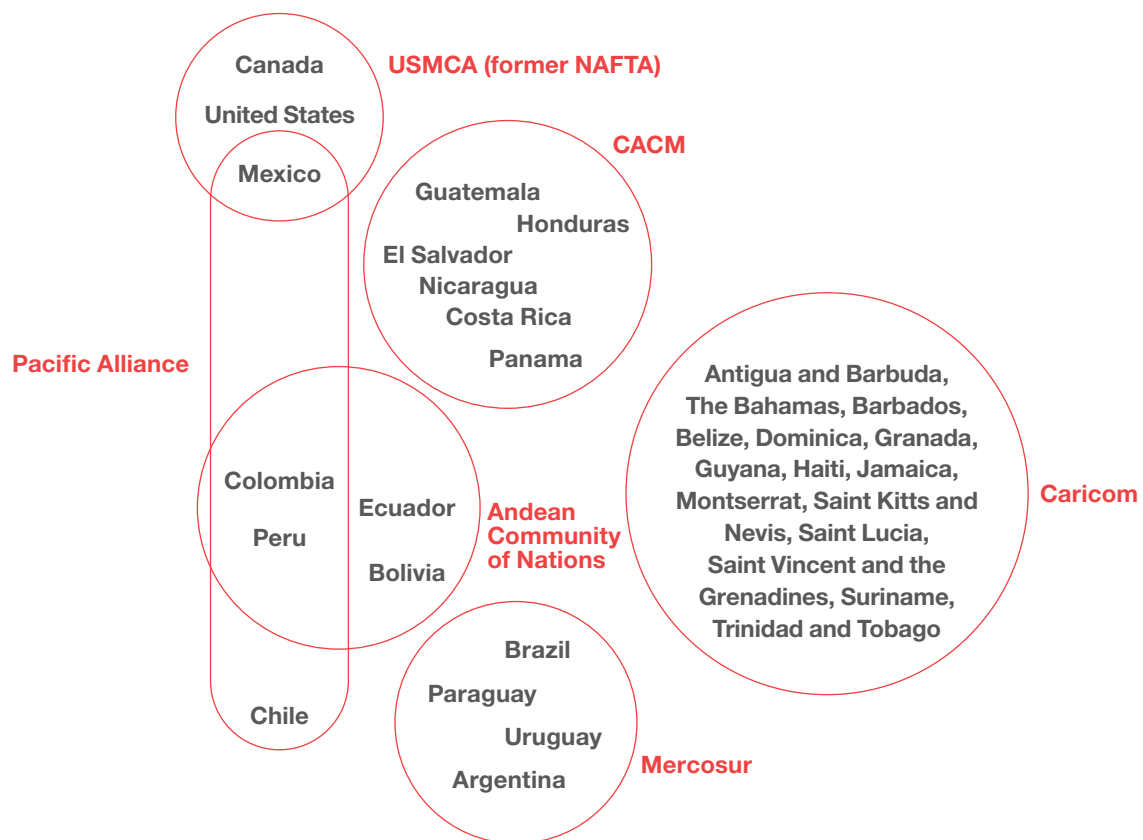
Source: Authors using data from the World Bank (2020b) and WTO and UNCTAD (2020) for Trinidad and Tobago.

One explanation for the relative stagnation of Latin American exports is that the opening of the region's economies did not generate significant increases in intraregional trade. However, before evaluating this hypothesis, it is worth recalling the map of the main regional trade agreements that connect the different countries in the region, shown in Figure 1.[3] Throughout the report, reference will be

3. In addition to these agreements, defined by their own rules and with a certain geographical affiliation, there are many other bilateral treaties between countries (approximately 33); some cover a wide range of products, while others have a partial scope. For example, the Dominican Republic is not a founding member of any of these agreements but has signed bilateral treaties with many of these blocs and individual countries. See Mesquita Moreira (2018) for more information.

made mainly to the North American Free Trade Agreement (NAFTA),[4] the Southern Common Market (Mercosur), the Central American Common Market (CACM), the Andean Community of Nations (CAN), and the Pacific Alliance (PA). In addition, the Caribbean nations are integrated into the Caribbean Community (Caricom). Not all these agreements share the same characteristics and depth in terms of liberalization policies. Mercosur, CAN, CACM, and Caricom are formally constituted as customs unions, in which, in addition to the internal liberalization of tariffs and non-tariff barriers (NTBs), a common external tariff is established. On the other hand, the PA and NAFTA are free trade agreements, whereby the signatory countries have reduced tariff and non-tariff barriers to internal trade and coordinated a series of other policies (e.g., government procurement, services, etc.) but maintain their independence in terms of external tariffs.

Figure 1
Main regional trade agreements

Notes: The figure uses a Venn diagram to illustrate the different regional trade agreements countries of the Americas have signed.
Source: Authors.

4. NAFTA was in effect until its successor, the United States–Mexico–Canada Agreement (USMCA) came into force on July 1, 2020.

As Table 2 shows for the Latin American region, the share of intraregional exports in total exports has fluctuated around 15% since the mid-1990s, with little change over the years. This compares with levels close to 60% for the European Union (EU), 45% for NAFTA, and 35% for the Association of Southeast Asian Nations (Asean) member countries, together with China, South Korea, and Japan (known as Asean+3). However, there is heterogeneity among the different sub-regions within the region. Central America has some of the highest levels of intraregional trade (between 15% and 17% in recent years),[5] followed by Mercosur, where there has been a significant decrease in internal trade flows, from 20% in the mid-1990s to 12% in 2015-2018. On the other hand, the Andean Community (CAN), the Caribbean Community (Caricom), and the more recently created Pacific Alliance (PA) show much lower and relatively stable levels of regional trade in relation to global trade (7% for the first two and 3% for the latter).

Table 2

Evolution of intraregional exports in total exports of goods and services,
by region or trade bloc (in percentage)

	1995-1999	2000-2004	2005-2009	2010-2014	2015-2018
Latin America and subregions					
Latin America	18	15	17	18	15
Mercosur	21	13	13	13	12
Pacific Alliance	3	2	3	4	3
CAN	8	8	8	7	7
CACM+DR	12	13	13	13	14
Caricom	8	8	9	8	7
Benchmark groups					
European Union	58	57	58	55	55
NAFTA	39	46	42	40	38
Asean+3	32	32	32	34	34

Notes: The table contains information on intraregional exports as a percentage of total exports of goods and services by region (average by sub-period). For the periods in which the different trade blocs were not formally constituted, trade between member countries is reported based on the current conformation of each bloc.
Source: Authors using data from BACI (CEPII, 2020), BaTIS (OECD and WTO, 2020), WTO and UNCTAD (2020).

Another way of analyzing the evolution of overall trade openness and its regional and extra-regional components is through the construction of so-called proximity indicators, which reflect the ratio between bilateral international trade flows and domestic trade (Moncarz et al., 2021). By incorporating domestic trade, these indicators better capture the efforts made by countries to open their economies and reduce international trade costs, given that such policies substitute internal trade with international trade.[6] Graph 2 shows estimates of the evolution of proximity indicators between the beginning and
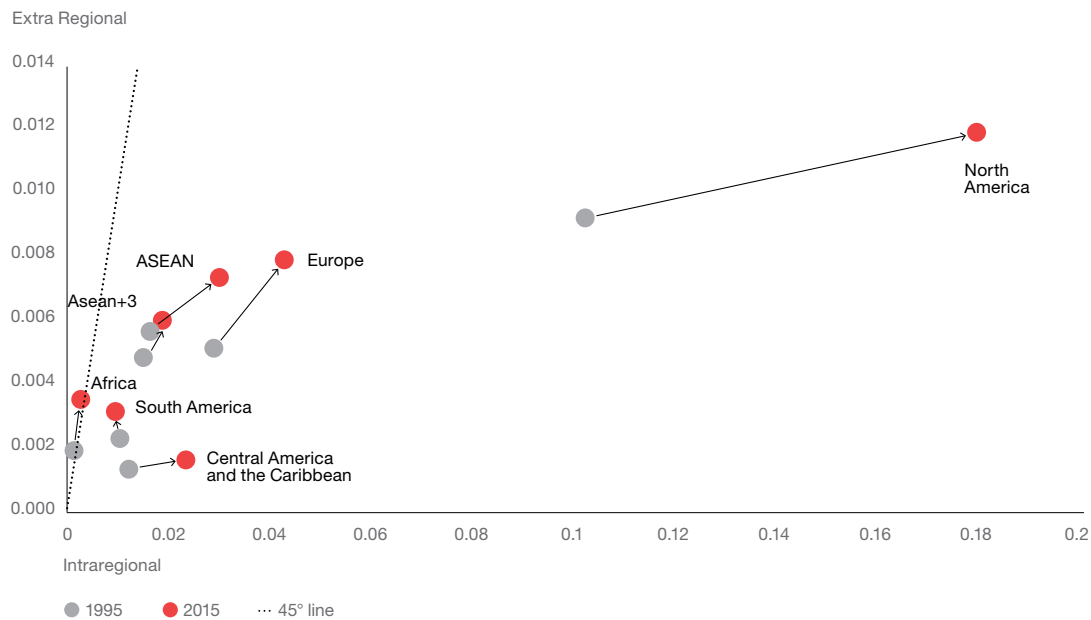
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5. If only exports of goods are taken into account, the proportion reaches 20-22%.

6. These proximity indicators are inversely related to international trade costs versus domestic trade costs. (Novy, 2013).

the end of the 1995-2015 period, distinguishing intraregional from extra-regional exchange of goods using manufacturing exports of each country or region. This distinction illustrates how the integration of each trade bloc with the world economy has been determined by the evolution of trade costs within or outside the region.[7] The distance of the segments describes the magnitude of this expansion, while their slope, in comparison with the 45-degree line, shows the bias in terms of trade within the regions vis-à-vis the rest of the world.

Graph 2

Proximity indicators by region and destination, 1995 and 2015

Notes: The graph shows the estimates of the proximity indicators (inverse of trade costs) comparing the years 1995 and 2015, for various regions of the world and distinguishing intraregional trade (X-axis) from extra-regional trade (Y-axis). The distance of the segments describes the integration trend of each trade bloc and the extent to which this is determined by the evolution of trade costs within and outside the region, while its slope compared to the 45-degree line shows the bias it has had in terms of trade within the regions vis-à-vis the rest of the world.

Source: Authors based on data from Moncarz et. al (2021).

At one end, North America and the European Union stand out. There was a significant increase in trade, both overall and within the regions, but which was clearly more intensive at the regional margin, reflecting reductions in the relative costs of trade between neighboring countries to a greater extent than with extra-regional partners. Asean, which is made up of developing countries with smaller economies, also shows a marked reduction in trade costs, with a greater bias in favor of trade within the region. The same effect occurs when the larger economies of Asia (Asean+3) are added, although to a lesser degree. The information for Latin America shows that, in the case of Central America and the Caribbean, there has also been a significant expansion of international trade (and the implied trade cost reduction) with greater weight within the subregion. At the other extreme, South America stands out, where international trade is increasing at a lower rate. At the same time, the slope of the

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7. Corresponds to items included in sections 5-8 of SITC 3, excluding 68.

line suggests that trade costs fell toward extra-regional destinations, while they increased toward those located within the region. This evidence reaffirms in part the weak increase in intraregional trade in Latin America (much more significant in the case of South America) seen above.

Evolution of tariffs and non-tariff barriers

As expected, unilateral openness measures and regional integration processes implemented across Latin America over the years have reduced tariffs. For example, since 2000, tariffs dropped from values close to 12% to approximately 6% in 2018 on average. This is a significant reduction, but these levels are still quite higher than those observed in developed (OECD) countries, with values of around 2% in recent years, suggesting there is still large room for further reduction.

The situation, however, is heterogeneous among the blocs as a result of the plurilateral trade agreements signed across the region (Table 3). On one hand, Caricom and Mercosur countries maintain high levels of trade protection compared with other Latin American subregions or external trade blocs. For example, external tariffs reach 12% in the Caribbean, although internal tariffs are much lower (2.7%). Mercosur, in turn, applies tariffs that reach almost 8% on average to NAFTA, the EU, and the Asean+3, and charges similar tariffs within the region for Central American countries. On the other hand, negotiations between Mercosur and the Pacific Alliance countries have largely reduced trade protection (with tariffs of 1.6%), although the agreements between Mexico and the largest Mercosur economies continue to be limited and significant tariff barriers persist (Mesquita Moreira, 2018; Mesquita Moreira et al., 2019). In addition, the internal liberalization within Mercosur has been completed for the most part, with average tariffs close to zero. This is also observed in the internal tariffs of the other trade blocs, which are very low (zero for the EU and NAFTA, and 2% for Asean+3).

Table 3
Internal and external tariffs per trade bloc (as a percentage), 2017

Importing region	Exporting region							
	Mercosur	**Pacific Alliance**	**CAN**	**CACM+DR**	**Caricom**	**European Union**	**NAFTA**	**Asean+3**
Mercosur	0.04	1.55	0.55	7.59	7.77	7.78	6.75	7.77
Pacific Alliance	1.23	0.34	0.62	2.31	5.03	1.09	0.55	4.50
CAN	0.69	1.04	0.26	6.15	6.70	4.29	4.30	7.09
CACM+DR	5.37	2.79	4.58	0.65	4.54	3.82	2.05	5.34
Caricom	12.24	12.10	12.10	11.49	2.57	6.91	12.25	12.26
European Union	3.57	0.60	0.37	0.45	0.02	0.00	1.75	2.30
NAFTA	2.15	0.42	0.98	1.01	2.68	1.42	0.24	2.95
Asean+3	6.87	5.86	6.28	6.83	6.91	6.17	6.46	1.98

Notes: The table shows the average tariffs applied in 2017 (as a percentage). The importing region is the trade bloc that applies the tariff, while the exporting region receives the tariff.

Source: Authors based on data from Teti (2020).

The Pacific Alliance levies the lowest tariffs on other countries and regions (below or close to 2%, except on Asean+3, reaching 4.5%, and Caricom, of approximately 5%) as a result of the multiple agreements signed by its member states with other trade blocs. Within the Alliance, the tariff preference is low; the internal tariff is close to zero. Central America is a similar case, although it applies slightly higher tariffs (4% to 6% for external tariffs and 2.8% for internal tariffs).

Non-tariff barriers (NTBs) are classified into technical and non-technical measures. The former comprise sanitary and phytosanitary measures, along with labeling and technical product requirements, including certification, tests, and inspection. These technical measures should not necessarily be considered as trade restrictions that decrease welfare because many of them aim to safeguard the quality of products and the sanitary safety of people and farming. What is important is that these requirements are implemented transparently and predictably.

Non-technical measures include trade restrictions that are hard to justify from a welfare perspective. These include anti-dumping, compensatory, and safeguarding measures, along with quantitative restrictions, like license requirements, quotas, and other measures to control quantities, in addition to import prohibitions, that are unrelated to sanitary and phytosanitary, or technical barriers. Non-technical barriers also include price controls on imported goods to support or stabilize the internal price of competing products or increase tax revenues.

Given the level of restrictions that these barriers involve (as suggested by the estimation of tariff equivalence measures) they may significantly restrict trade and, in several cases, are comparable to tariff barriers in magnitude if not higher. For example, within Mercosur, the sum of the costs of technical plus non-technical measures in Argentina results in an import tariff equivalent to 11%, higher than the average external tariff (8%). In the case of the Pacific Alliance, Colombia has an equivalent NTB of 7%, while the average tariff is 5.7%.[8] The negotiation of (both regional and extra-regional) free trade agreements gradually reduces these barriers or makes them more homogeneous, while limiting their discretionary use.

The impact of trade costs on bilateral trade flows

The persistence of these tariff and non-tariff barriers is one of the reasons why trade has not been fully dynamic within Latin America. The report brings new evidence on this matter by estimating a gravity trade equation where the exchange of goods between two countries depends on the size of their economy and the costs of trade (including trade barriers, and distance or transport costs). The estimation used data from the period 1995-2015 for the manufacturing sector[9] and includes domestic trade of these products. Using the resulting regression coefficients, Table 4 describes the decomposition of the impact of the different drivers on trade of manufactured goods: market size and complementarity (similarity of productive structures), preferential trade policy (the effect of free trade agreements), non-discriminatory trade policy (Most Favored Nation [MFN] tariffs) and statistical error.

Estimates presented for the different sub-regional blocs—Mercosur, CAN, and CACM—and for benchmark extra-regional blocs—the EU plus Europe's non-community partners with which it signed trade agreements (EU+FTZ), NAFTA, and Asean+3.

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8. This is also the case for the EU and NAFTA, where the tariff equivalent of NTBs is quite higher (6.5% vs. 1-1.2%), given the relatively low level of applied tariffs. The difference is much smaller in Asean+3 countries (6.3% vs. 5.2%).

9. In Chapter 2 of the report, the estimation also covers the agricultural sector.

In terms of the magnitude and dynamics of the absolute variation (see table columns 1 and 2), intraregional trade under Latin America's free trade agreements is marginal compared to NAFTA, the EU+FTZ, and Asean+3. However, this should not be surprising, given the different sizes of these economies. On the other hand, the increase in intraregional trade in the Asean+3 countries, which multiplied by a factor of 8+, is remarkable. This variation can be largely explained by the effect of the market size, where China's sudden and sharp entry has had a significant impact. Market size is also the most relevant driver in the other integration agreements analyzed in Table 4 (columns 3 and 8).

Table 4

Breakdown of intraregional trade drivers for the manufacturing sector
per selected plurilateral trade agreements, 1995-2015

Trade bloc	Intraregional trade 2015	Change in intraregional trade 2015-1995	Size +TC	FTA: Direct and indirect effects	MFN tariff	Residual	Intraregional trade variation 2015-1995 (%)	Size +TC	FTA: Direct and indirect effects	MFN tariff	Residual
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Millions of USD							Share in trade variation 2015-1995 (%)			
Mercosur	29,153	16,512	14,065	742	-1,181	2,886	130.6	85.2	4.5	-7.1	17.5
CAN	6,598	5,173	3,672	167	1,094	240	362.9	71.0	3.2	21.1	4.6
CACM	8,292	6,779	4,132	712	1,048	887	447.8	61.0	10.5	15.5	13.1
NAFTA	921,462	643,677	340,514	48,171	117,089	137,903	231.7	52.9	7.5	18.2	21.4
Asean+3	665,581	586,676	555,014	34,249	68,904	-71,490	743.5	94.6	5.8	11.7	-12.2
EU	2,293,310	1,150,905	427,534	392,132	329,023	2,215	100.7	37.1	34.1	28.6	0.2

Notes: Trade decomposition is based on Bennet's method. The International Standard Industrial Classification of All Economic Activities (ISIC), revision 3, was used to form the primary (AB) and manufacturing (D) sectors.
Source: Authors based on Moncarz et al. (2021).

As mentioned, trade policy was divided into two channels: the preferential channel (FTA) (columns 4 and 9)[10] and the non-discriminatory channel (MFN) (columns 5 and 10). The FTA-related effects played a dynamic role in CACM's manufacturing trade (accounting for over 10% of the variation) and contributed very little to South America plurilateral trade agreements (CAN and Mercosur). Liberalization resulting from MFN's reduced tariffs, in turn, had a regressive role across Mercosur (because these tariffs increased during the period under analysis) and a positive impact on the other two Latin American agreements (CAN and CACM). Overall, all forms of trade liberalization accounted for a quarter of the variation in manufacturing trade across CAN and CACM member countries and had a slightly negative impact on Mercosur (the sum of the coefficients in columns 9 and 10).

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10. The effect of free trade agreements (see the absolute variation in column 4 and their share in total variation in column 9) adds the direct form of influence represented by the binary variable that indicates the existence of a free trade agreement and its interaction with the preference margins, in addition to the interactions of these preferences with the number of agreements signed by the country of origin and the country of destination of exports. It also includes the effect of the indicator that summarizes the aggregate accumulation of free trade agreements between both countries. This variable is intended to capture the complementarity between preferential openness and non-discriminatory openness.

In addition to trade liberalization, estimates under the gravity model of trade can assess the effect of more structural variables, like geography (e.g., distance). An aspect worth analyzing is whether the low trade observed in the region could also be due to the advantage of geographic proximity within Latin America not being as relevant as in other blocs in terms of lower transportation and logistics costs. In other words, the effective distance is larger than what the physical proximity among the countries would suggest, compared with other regions of the world. Data seem to confirm this assumption, suggesting that border requirements and formalities need to be simplified to drive trade in Latin America, not just a lowering of tariffs and non-tariff barriers. In addition to fostering productive integration, infrastructure for the transport and exchange of merchandise and regional goods, like energy, must be improved. These topics will be discussed below.

Customs costs and trade facilitation

Costs incurred from customs formalities and procedures required by other agencies (for example, animal health) must be added to the costs represented by tariffs and non-tariff barriers, both for imports entering Latin American countries and for exports to regional and extra-regional destinations.

Even though these measures, in principle, do not depend on the origin of imports and the destination of exports, they may have a higher impact on regional trade. In a context of lower MFN tariffs, the reduction of these alternate sources of trade costs could disproportionally benefit regional trade, as it enables the advantages of geographic proximity to emerge, and this encourages new trade agreements that further reduce tariffs. These policies will strengthen the process of open regionalism, given that regional trade does not increase with distortions leading to trade diversions, but because of measures that result in trade creation.

Trade facilitation comprises the simplification, standardization, digitization, and harmonization of the different procedures, such as the required paperwork, the payment of fees, the certification of technical requirements, and the inspection of merchandise, among other mandatory formalities for the movement of goods, services, or productive factors among countries that impact the final cost for consumers (Maldonado and Pérez, 2020). In line with the importance of these costs for trade flows, the WTO Trade Facilitation Agreement was signed (in force since 2017). The agreement contains provisions expediting the movement, release, and clearance of goods, including goods in transit, in addition to measures for effective cooperation between customs and other incumbent authorities in the matter of international trade flows.[11]

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11. The agreement further contains provisions for technical assistance and capacity building in this area (WTO, 2021).

The OECD has implemented a system to collect and process data on trade facilitation indicators (TFIs) in eleven areas that are relevant to assess these policies.[12,13] Panel A in Graph 3 presents information on the different indicators for the region's plurilateral trade agreements as of 2019 (Mercosur, Pacific Alliance, and the CACM), as well as for Asean+5,[14] the U.S. and Canada, and the EU. As the graph shows, the U.S.+Canada and the EU countries record the highest indicators on average across all areas. CACM countries feature the lowest record in most areas. Mercosur and Asean+5 countries rank at comparable intermediate levels. The position of the Pacific Alliance countries is slightly better than those of Mercosur but lower than the best-observed standard. Overall, the average value for the region's plurilateral trade agreements shows that these sub-regional blocs lag in terms of the institutional areas associated with governance and impartiality, border agency cooperation, and availability of information.

Within the region and each sub-region, the performance of this indicator is heterogeneous. Countries like Bolivia, Honduras, or Venezuela perform poorly, in line with low or lower-middle-income countries. On the other hand, the Pacific Alliance, Costa Rica, and Mercosur countries (except for Paraguay) perform well with indicators close to the average of high-income countries, although lower than U.S.+Canada or the EU (panel B).

As has already been described, border time and costs are a significant component of trade costs, and trade facilitation aims to reduce them. Based on information from the World Bank's Doing Business report, Graph 4 shows the monetary and time costs of a standard foreign trade transaction under the above plurilateral trade agreements. Monetary costs associated with foreign trade (panel A) are lower in U.S.+Canada and the EU. Information for Latin America shows that the different sub-regions are quite heterogeneous. Mercosur charges for border formalities are the highest. One step below, the Pacific Alliance charges slightly more than CACM and Asean+5.

On the other hand, the poor performance under most plurilateral trade agreements in Latin America compared with the U.S.+Canada and the EU stands out regarding the time required for the completion of transactions (panel B). While border formalities in Latin American countries demand from 80 to 100 hours (similar to Asia), the U.S.+Canada and the EU require less than 10 hours.
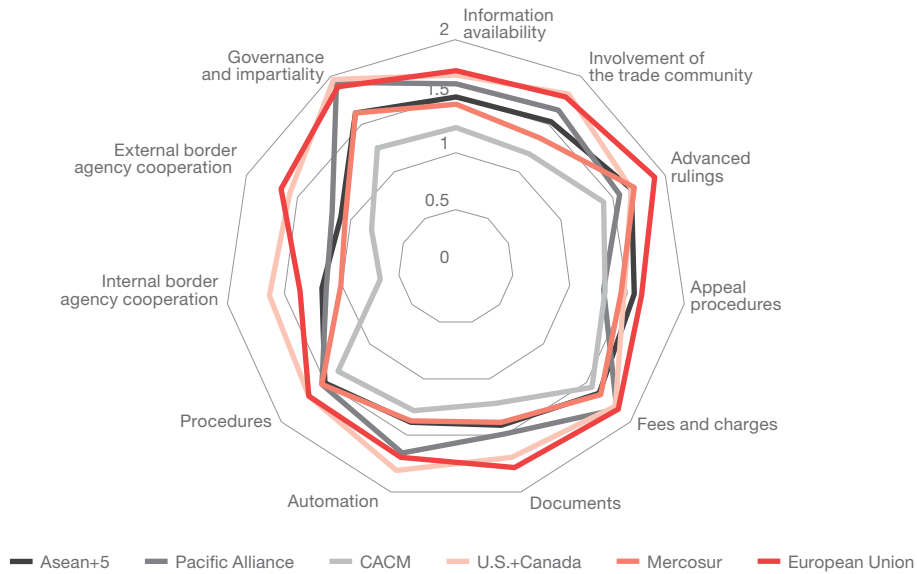
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12. Available on OECD's website: http://www.oecd.org/trade/facilitation/indicators.htm

13. According to the OECD (2018), TFIs are based on a questionnaire that can be compared over time and among different jurisdictions. Data are drawn from three sources: a) public information available on the website of customs and other border government agencies; b) data sent by countries' administrations; and c) information received from the private sector. The construction mechanism involves a full process of primary data review and adjustment that is performed by OECD's technical services.
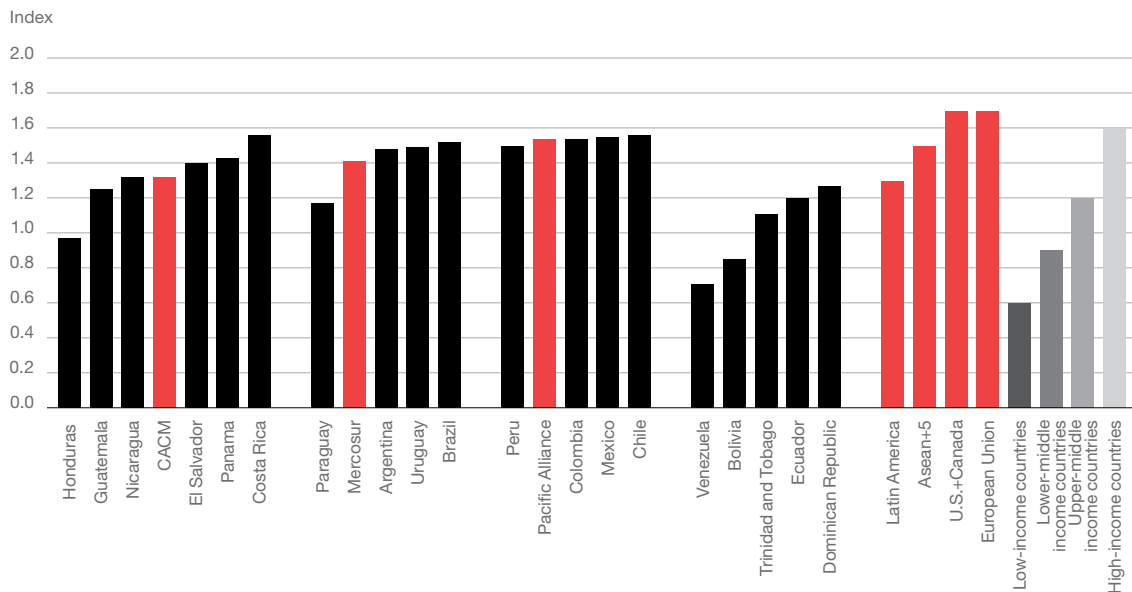
14. Japan, China, South Korea, New Zealand, and Australia have joined the Asean group of nations to form the Asean+5 group.

Graph 3

OECD's Trade Facilitation Index, 2019

Panel A. Dimensions

- Asean+5
- Pacific Alliance
- CACM
- U.S.+Canada
- Mercosur
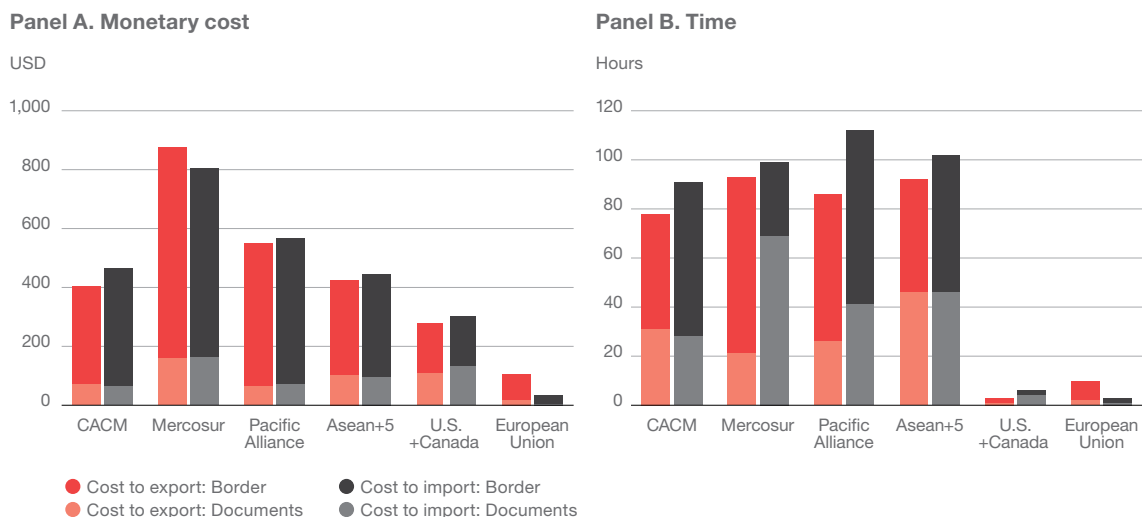- European Union

Panel B. Values

Index

Notes: Panel A shows the simple average in each group of countries for each of the OECD's 11 trade facilitation indicators in 2019. Each bar on Panel B represents the average of these 11 indicators for the different Latin American countries and benchmark regions. The indicator values range from 0 to 2, where 2 is the best performance attained.

Source: Authors based on Trade Facilitation Indicators data (OECD, 2019).

Graph 4
Cost and time of a standard foreign trade transaction, 2019

Panel A. Monetary cost

USD

Panel B. Time

Hours

● Cost to export: Border   ● Cost to import: Border
● Cost to export: Documents   ● Cost to import: Documents

Notes: In the case of imports, the transaction is based on 15 tons of auto parts imported by the most relevant trading partner of the sector. For exports, the transaction is based on exporting the product having the largest comparative advantage to the most relevant trading partner of the sector. Simple averages are shown for each country group.

Source: Authors based on data from Doing Business (World Bank, 2020).

Trade facilitation in services

Trade facilitation in services focuses on aspects regarding economic regulation in these sectors. While the liberalization of international transactions in this activity increased through multilateral negotiations, regional and extra-regional preferential trade agreements gradually moved forward with regulatory harmonization. Economic integration agreements (EIAs), which go beyond FTAs in terms of trade liberalization, have become a predominant modality since 2000. Moreover, they have been the leading driver in the harmonization of regulations having an impact on trade in services.

The challenge of assessing this matter is the availability of comparable data both between countries and over time. The OECD Services Trade Restrictiveness Index (STRI) attempts to systematize this information for 22 sectors in OECD countries and a group of non-member countries. For Latin America, the STRI covers Brazil, Chile, Colombia, Costa Rica, Mexico, and Peru. In each sector, STRI indicators reflect five types of regulatory restrictions that impact trade or productive integration in these sectors among different countries. They are: a) restrictions on foreign entry; b) restrictions to the movement of people; c) other discriminatory measures; d) barriers to competition; e) regulatory transparency.[15]

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15. A range is defined for each of these areas, which are then weighted to construct combined indices with values between 0 and 1, where 1 is the most restrictive value.

An analysis of the aggregate level of restrictions for all sectors shows that the region's average (0.28) is higher than the OECD's (0.24), suggesting stronger limitations for trade in services in general. The largest differences are found in foreign entry and regulatory transparency areas. Within the region, Mexico and Brazil, with values of 0.36 and 0.34, respectively, are the economies having the strongest restrictions, while Chile, with an average of 0.20, is the country in the region imposing the mildest barriers.

The analysis of restriction levels per sector reveals that Latin America has enforced fewer limitations than the OECD in sectors related to professional services, like accounting, engineering, architecture, or legal. However, restrictions are stronger in some key sectors for productive development, like telecommunications and financial services (considering both commercial banking and insurance), and most subsectors associated with transportation and logistics, like road transport, courier services, customs clearance, or warehousing.

Facilitation initiatives

Four instruments stand out among those most widely used by countries to implement these trade facilitation measures: the single window for foreign trade (SWFT), supporting digitalization and simplification of customs formalities in one portal concentrating all foreign trade operation procedures; the implementation of the *Exporta Fácil (EF) p*rogram, aimed at expanding the participation of SMEs in exports by introducing simplified postal services; the so-called Authorized Economic Operator (AEO) to certify companies with proven capacities and compliance with foreign trade operation requirements to reduce controls on them; and the International Goods in Transit system (*Tránsito Internacional de Mercancías, TIM),* which facilitates the international transport of export goods entering and leaving the territory of a country with the aim of reaching a third market.

Most of the region's countries have already implemented or are taking steps to implement SWFTs, ensuring their interoperability with their main trade partners. Costa Rica's SWFT is a very interesting example. Its positive impact on exports, particularly international sales by SMEs, has resulted in large savings of time and costs with a significant environmental impact.

The *Exporta Fácil progra*m was first implemented as an initiative in Brazil. It was later replicated in other Latin American countries after it was included among the priority projects of the Initiative for the Integration of the Regional Infrastructure of South America (*Iniciativa para la Integración de Infraestructura Regional en Sudamérica, IIRSA*). Peru launched a similar project in 2008, followed by Colombia and Uruguay (2009), Ecuador (2011), Chile (2015), and Argentina (2017), among others. This instrument has reaffirmed that postal services can be an important tool for economic development. In addition, it highlights the importance of developing and strengthening postal infrastructure in South America for governments to support regional integration and implement public policies targeting inclusion.

TIM is a system that facilitates international trade for goods that are in transit in a country to enter a third market. It has been successful in Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama), where it was first implemented at the beginning of the past decade (2011-2013). The goal is to simplify documents and procedures using an online system to handle and control the transit of goods, including the establishment of unified border control; the implementation of technology to interconnect entities involved in the customs tracking of goods in transit; system modernization, replacing the different forms used with a single form that contains the information from multiple agencies (including customs, migration, and health); and stronger cooperation among related national agencies.

Most trade facilitation measures are applied on a non-discriminatory basis, favoring all foreign trade transactions, irrespective of the origin or destination of goods. However, it is worth highlighting that progress achieved regarding other trade facilitation aspects, such as initiatives for the interoperability of foreign trade databases (e.g., the mutual recognition of digital rules of origin certificates) and, particularly, the interoperability of SWFTs between neighboring countries or the international transit agreements (TIM), are facilitation mechanisms that require a certain degree of reciprocity. Therefore, their effective implementation should be supported by a broader agreement that facilitates policy coordination among countries.

Transport infrastructure

Transport costs are a fundamental component of trade costs. These costs are naturally dependent on distance, which favors neighboring economies becoming natural trading partners. However, the cost advantage that physical proximity provides should be made effective. The services provided by transport infrastructure among countries play a critical role in this regard.

The effect of distance (as a rough measure of transport costs) on bilateral trade flows can be calculated by means of a structural gravity model of trade. As mentioned above, the results of the estimation undertaken for this report suggest that distance has a larger impact on bilateral trade in Latin America than in other regions, like Europe, North America, or East and Southeast Asia, suggesting that transport infrastructure can still help to decrease trade costs.

The analysis of transport infrastructure that follows highlights three major features. First, it has a network structure, which implies the presence of complex interrelationships among all connected locations within and between countries. Therefore, a robust analysis of the impact of transport investments and regulatory interventions requires considering direct and indirect effects.

Second, transport infrastructure comprises different modes (sea, road, rail, air) whose availability, quality and relative costs are relevant for the sectoral composition of the economy. Each mode has particular characteristics that make it more or less suitable to service an industry based on the characteristics of the carried goods (e.g., the unit value of carried weight or fragility), frequency of dispatches, or the distances involved.
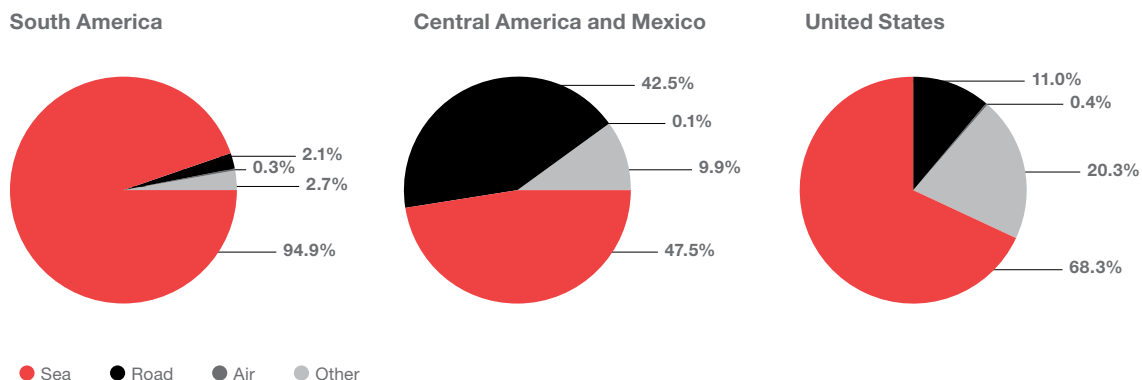
Third, distribution nodes are a key component of transport infrastructure. They include ports, airports, and border crossings. These nodes are where bottlenecks tend to occur, which hamper the performance of transport services to a large extent. For the freight transport process to be conducted in an efficient and foreseeable manner, accessibility to these facilities is essential, as well as the efficiency of merchandise loading, unloading, storing, and the associated bureaucratic procedures to carry out these activities.

Infrastructure assessment

An analysis of the transport modal split of international trade in different American sub-regions and countries (Graph 5) shows that maritime transport has a large share in South America, while in Central America and Mexico or the U.S., even though it is also the main transport mode, road transport plays a major role as well. The larger share of land-based trade in international trade in the U.S., and Central America and Mexico partly results from a higher volume of intraregional trade, which involves intensive use of this type of transport (Graph 5).

Graph 5

Composition of transport modes used in international trade, 2017

South America

Central America and Mexico

United States

- ● Sea
- ● Road
- ● Air
- ○ Other

Notes: The reported values reflect the share of each transport mode in each country or region's exports according to the carried weight.

Source: Authors based on data from ECLAC (2019) and the Bureau of Transportation Statistics (2021).

Naturally, both globally and regionally, the intensity of use of the different transport modes depends not only on market locations (regional vs. extra-regional) but also on the goods traded. The fact that the South American modal split is more dependent on the maritime mode can be partly explained by its composition of exports, characterized by a high share of agricultural and mining goods that typically require port infrastructure to facilitate bulk freight. In general terms, the composition of international trade is determined by considering the sectors, trading partners, and transport modes jointly. However, transport infrastructure availability will condition the development of new trading relationships according to the sufficiency and suitability of the support the existing infrastructure provides. Thus, deficient land connectivity among countries that share borders may represent a large barrier for regional trade, productive integration, and the establishment of regional value chains.
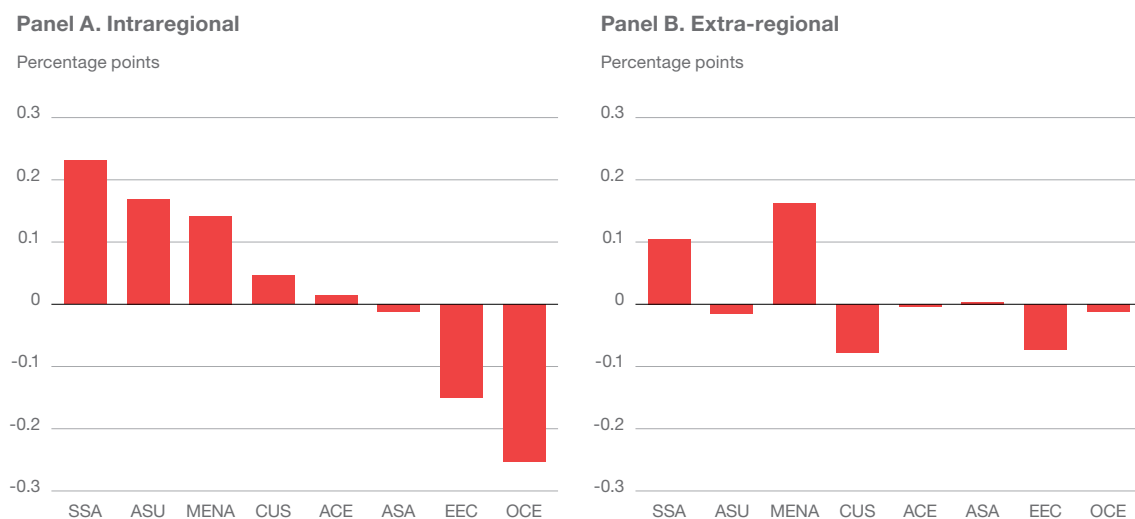
As a first step to studying the level of services provided by the region's transport infrastructure, surveys were used to assess the private sector's perception of the barriers that freight transport poses to their activities. This report received input from interviews with companies that participate in international trade and logistic operators from selected Latin American countries. Their analysis findings suggest that freight transport faces widespread problems across the region, mainly affecting overland modes. Similar results can be found using one of the indicators in the World Bank Enterprise Surveys (WBES): over 40% of exporters in Bolivia, Costa Rica, Paraguay, and Uruguay identified transport infrastructure as a major barrier to their operations, reaching 80% for Bolivia.

Beyond companies' perceptions of the quality of the transport services they receive, relative transport costs between countries play a vital role in shaping their comparative advantages. An indirect way to measure these costs is to consider the difference between Cost, Insurance and Freight and Free on Board values (CIF and FOB) reported as a proportion of the FOB rate. Data are widely available across countries and traded goods, which is an added advantage.

Graph 6 presents the transport cost premium across regions based on these data relative to the average of European Union (EU) economies. South America (ASU) transport costs for intraregional trade exports are 15% higher than the EU's (panel A), providing further evidence of the role of transport costs as drivers of the low level of intra-zone trade. On the extra-regional front (panel B), however, no significant cost differences are observed between South America and the EU. This suggests that the poor performance of transport infrastructure impacts mainly intraregional trade, where land transport has a predominant role. In Central America and the Caribbean (ACE), there are no significant transport cost differences relative to the EU.

Graph 6
Transport costs relative to the European Union for intraregional
and extra-regional exports, 2016

Panel A. Intraregional

Percentage points

Panel B. Extra-regional

Percentage points

Notes: The bars show the higher transport costs for intraregional (panel A) and extra-regional (panel B) exports in each region relative to the European Union. These costs correspond to the coefficients of regions' fixed effects in the regression of the CIF-FOB margin (in logs) and controlling for categories of exported goods. Included regions are Sub-Saharan Africa (SSA); South America (ASU); North Africa and the Middle East (MENA); Canada and the United States (CUS); Mexico, Central America and the Caribbean (ACE); Asia Minor and Southeast Asia (ASA); Eastern Europe (EEC) and Oceania (OCE).

Source: Authors based on UN data (2021).

Air transport

In general, the opening of new airline routes and the scheduling of new services on existing routes are globally driven by a growing demand for passenger transport (Planzer and Pérez, 2019). This offers opportunities for air freight shipment as typically passenger flights have excess capacity in cargo hold compartments that can be used to carry goods. In many cases, this opportunity enables air transport for routes that do not meet the necessary scale for the establishment of dedicated air cargo services. Scheduled airline services, in turn, show clear advantages: they are predictable compared with air charter services and the air mode is faster than alternative modes of transport.

In Latin America, the volume moved by freight air transport grew more than the global average, increasing 90.5% from 2009 to 2018 (Sánchez and Weikert, 2020). According to the Latin American & Caribbean Air Transport Association (*Asociación Latinoamericana de Transporte Aéreo, ALTA)*, one-third of the region's air transport activity—measured in tons per kilometer (tons/km)—comprises intraregional traffic, while two-thirds account for extra-regional traffic, almost 80% of which covers the region's trade with the United States and Canada. Most movements (65%) depart from or arrive in South America, particularly Brazil, Colombia, and Chile. A significant portion of freight is carried in the cargo hold compartments of passenger flights (and occupy up to 40% of these units), while dedicated cargo aircraft is used for large volumes.

In order to continue to capitalize on the opportunities offered by air cargo transport, it is vitally important, first, that airport infrastructure investments envisage the development of dedicated cargo transport facilities, which should include road connectivity for smooth truck access, warehousing, loading and unloading equipment, and cold storage facilities when needed for the transport of fresh produce, flowers or medication, among other goods. Second, the development of physical facilities should be accompanied by trade facilitation initiatives that can simplify processes and improve the coordination between the agents involved in international trade.

Maritime transport

By large, maritime transport is the most important pillar for international trade in goods, covering over 90% of trade in the region. This predominance partly originates from the low total cost per ton per kilometer for medium and long distances, which helps spread out port management expenses.
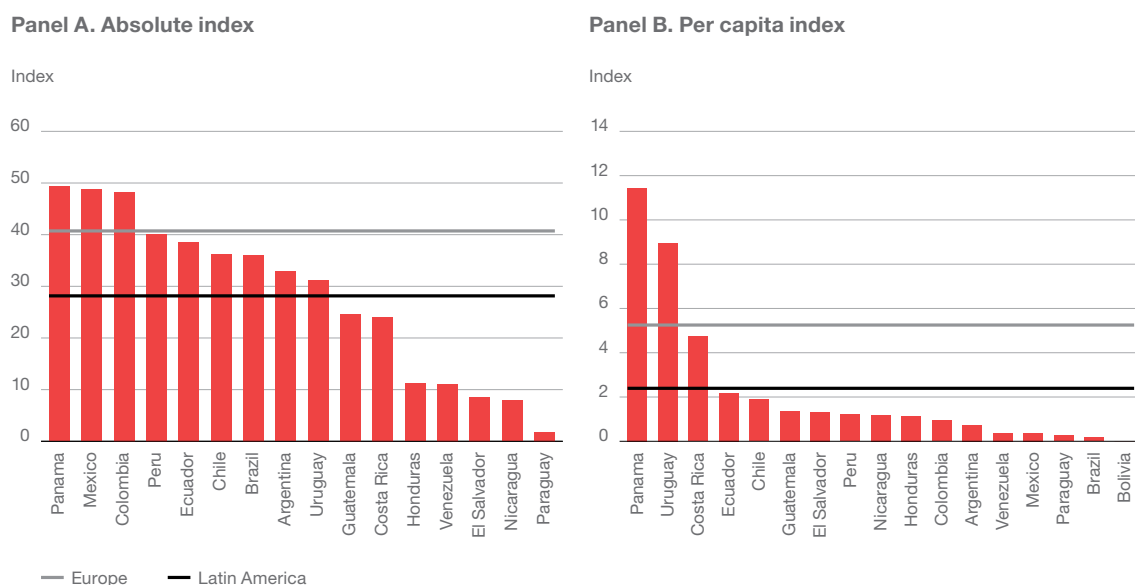
There are three main sources of pecuniary costs associated with the use of maritime transport: transport and port management insurance, port management costs, and transport costs. Transport time and waiting times at the ports of origin, transshipment, and destination should be added to these costs. Origin-destination transport time depends on distance and the number of intermediate stops (with or without transshipments) required to reach the final location. Finally, waiting times are related to the efficiency of port operations and the availability of ships that can cover the required route, which highlights the importance of the connectivity between country ports to determine the total cost of the transport of goods.

The United Nations Conference on Trade and Development (UNCTAD) produces and publishes a widely used indicator that quantifies maritime connectivity of a broad set of countries, called the Liner Shipping Connectivity Index (LSCI). This index comprises six indicators for three areas of analysis: number of scheduled services, port capacity, and number of services available at each destination. Graph 7 shows the index value for Latin American countries, along with the averages for the region and EU countries. The index basis is 100, which corresponds to China's value in 2006 when the series was first published. Paraguay is also represented despite being a landlocked country since it has maritime connectivity through the Paraná River (UNCTAD, 2017).

The graph shows that the average connectivity in Europe is 45% higher than the average in Latin America, while this gap goes up to 119% on a per capita basis. Maritime connectivity in the region is highly heterogeneous: while Panama ranks at the top with an aggregate index close to 50, largely explained by the large flow of ships that cross the Panama Canal, on the other end, Venezuela's performance is comparable to small Central American economies with values around 10 points.

The cases of Costa Rica and Uruguay are noteworthy in this regard, as they benefit from a high degree of connectivity relative to the size of their economies, thanks to their privileged geographical positions: Costa Rica's proximity to Panama favors good connectivity through feeder services that use the latter country as a hub, thus allowing a close connection to multiple destinations; Uruguay, in turn, benefits from its position between Argentina and Brazil and acts as a strategic transshipment point for services originating in its two large neighbors (UNCTAD, 2017).

Graph 7

Liner Shipping Connectivity Index, 2020

Panel A. Absolute index

Index

Panel B. Per capita index

Index

— Europe   — Latin America

Notes: The Liner Shipping Connectivity Index (LSCI) quantifies each country's integration into the global maritime logistics market: the higher the value, the larger the integration. The index basis is 100, reflecting China's value in the first quarter of 2006. Panel A presents each country's index, while panel B deflates these values by the population of each country, using World Bank data (2021). The horizontal lines show the simple average for Latin American countries (included in the graph) and Europe.

Source: Authors based on UNCTAD (2021) and Word Bank (2021) data.

Improved port infrastructure, comprising high-quality land connectivity, warehousing facilities, infrastructure for merchandize and container handling, and efficient port operation systems, leads to reduced operational costs favoring the establishment of service providers for international trade. In addition, efficiency improvements and reduced port operation costs incentivize the redirection of land freight to the most efficient port, while the growing demand for port transport boosts liner frequency and destinations available.

Land transport

Land transport is a vital component of a country's connectivity. First, it enables inland regions to participate in international trade and allows even distant regions to share in the gains from trade. Second, it favors trade between neighboring countries, with a large potential for productive integration. Typically, the dimensions analyzed to assess the quality of land transport infrastructure services are coverage, quality, and intermodal infrastructure distribution (road and rail).

Regarding coverage, road networks in the region show very low density relative to countries' surface area and population. On average, Latin American countries' road network density is below 200 km of roads per every 1,000 km^2, which contrasts with an average value of 1,400 km in OECD countries. Relative to population, the region's average density is 1.2 kilometers of roads per 1,000 inhabitants, while this indicator is above 4 km in North America and exceeds 6 km in Western European countries.[16]

Regarding quality, using the proportion of paved primary and secondary road networks, Panama and Uruguay stand out, with values above 90%, while for countries such as Bolivia or Colombia this figure is around 20%. Focusing on paved primary and secondary road network density, Uruguay, Argentina, and Panama stand out with the most extensive coverage per capita, with 232 km, 189 km, and 172 km per 100,000 inhabitants, respectively. In turn, Ecuador, Mexico, and Panama's coverage is more extensive relative to their surface area, in line with their higher population density.

Intermodality can be examined using the share of road and rail transport in the total transport of goods as an indicator. Except for Brazil, Colombia, Mexico, and, to a lesser extent, Peru and Bolivia, overland cargo transportation is mainly carried by roads. This low share of rail transport may suggest that the region is not making full use of the comparative advantages offered by the different land transport modes to improve freight costs for domestic and international trade.

Road networks and market access in Latin America

An alternative to the use of infrastructure stock indicators is to develop indicators for transport services based on measures of market access. These measures consider the differences in the distribution of population and geographical features, therefore providing a more accurate depiction of the actual services provided by the existing transport infrastructure and the potential gains that improved facilities could produce, allowing comparisons among widely dissimilar countries. The indicators computed for this report consider the potential consumer markets that a business could reach from every location depending on alternative assumptions of travel times and routes used.

The market access indicators that follow are based on travel times between a country's main cities, as reported by Google Maps. The baseline scenario corresponds to: 1) actual travel times reported by Google Maps, 2) using the fastest available route, and 3) typical traffic congestion conditions. To build a measure of the potential gains from road investments that can enhance market access, the calculation considers the counterfactual scenario of the market access that would prevail if road infrastructure improvements enabled a constant travel speed of 90 km/h.[17]

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16. This Western Europe measure includes member countries of the former European Economic Community.

17. This exercise may also be done using lower or higher speeds.

By comparing the market access measures for the two scenarios, gains in market access can be calculated as a ratio of the values between the counterfactual scenario (using an average speed of 90 km/h) and the baseline scenario. The first two columns in Table 5 show the potential gains that result from the improvement of roadways connecting a country's inland cities calculated with this methodology, considering a travel time cutoff of six hours (first column) and the maximum value found from among all the possible travel times (second column) for the referred ratio. The estimation is presented for Latin American economies, along with Spain and the U.S., which are taken as a benchmark.

Potential gains in market access among Latin American countries are largely heterogeneous when considering a six-hour travel time cutoff. Gains are very significant for Colombia and Bolivia: in both cases, an average business could increase market access more than 100% with this counterfactual exercise relative to the baseline scenario. This indicator reaches 56% for Ecuador and about 25% for Venezuela, Peru, and Brazil. In contrast, potential gains for Spain and the U.S. are null.[18]

The second column in Table 5 shows the maximum value found for the increased market access across all time cutoffs to accommodate the fact that relevant travel times in the smallest countries are shorter. The analysis now displays very significant gains for most countries, with a 50% average for the region, which again contrasts with the almost null gains for Spain and the U.S. Colombia and Bolivia display the highest potential gains from this counterfactual exercise, reaching 107% and 116% respectively. Brazil, Ecuador, and Guatemala's values range between 80% and 92%. This analysis reveals large shortfalls in internal road connectivity in the region, although with some exceptions for the cases of Chile, Costa Rica, Panama, and Uruguay.

In the same way that a market access indicator can be developed for a country's inland cities, a bordering market access index can also be constructed by assessing travel times between all cities in a given country of origin to all the locations in all the countries with which it shares land borders. An analysis of the change in levels (measured in millions of people) in international market access shows that Bolivia and Peru stand out as having the highest potential gains considering a 12 and 36-hour[19] travel time cutoff (third column). This suggests that road infrastructure in these countries is lagging and that this is hindering the countries from reaching a large share of their potential access to the markets of their neighbors.

18. In the two countries used as a benchmark, typical average speeds reported by Google Maps tend to exceed the target speed of 90 km/h, meaning that the counterfactual exercise under consideration entails market access losses. For these cases, negative values were replaced with equivalent zeros, considering only interventions that can improve road infrastructure, preserving the current quality in the cases discussed here.

19. For Costa Rica, El Salvador, Spain, Honduras, Nicaragua, and Panama, 12 hours were used, because 36 hours would complete the route from all the internal cities to each city in the neighboring country.

Table 5

Access gains to internal markets resulting from infrastructure improvements

Country	Internal market access		International market access			
	Market access index percentage gain		Absolute gain (millions of people)		Gain as an internal market percentage	
	Up to 6-hour travel time	Maximum gain	12-36 hours	Maximum	12-36 hours	Maximum
Argentina	1.5	18.8	11.1	26.5	35.6	84.6
Bolivia	103.3	103.3	41.5	57.0	635.2	873.0
Brazil	23.8	78.1	6.6	34.4	7.1	37.0
Chile	0.0	12.9	1.9	17.3	15.3	138.9
Colombia	110.7	113.2	13.8	77.6	56.5	317.8
Costa Rica[a/b/]	0.0	11.7	0.3	2.4	10.8	88.3
Ecuador	55.6	68.3	6.4	26.1	71.8	291.5
El Salvador[a/b/]	0.0	26.7	0.2	7.3	8.5	275.0
Guatemala	17.0	73.9	3.9	34.0	38.5	332.2
Honduras[b/]	6.7	60.7	1.9	8.1	38.5	163.1
Mexico	7.8	26.1	0.0	5.0	0.0	7.3
Nicaragua[b/]	7.5	53.0	0.2	4.3	8.6	162.7
Panama[b/]	1.9	9.4	0.2	2.3	8.6	82.8
Paraguay	7.1	50.3	3.1	43.9	70.7	1003.4
Peru	23.2	42.8	21.0	59.6	117.9	334.9
Uruguay	6.1	6.1	2.4	22.5	92.9	855.6
Venezuela	27.5	29.5	2.1	82.3	10.9	423.5
Spain[b/]	0.0	0.4	0.0	0.3	0.0	1.2
United States	0.0	0.0	0.0	0.0	0.0	0.0

Notes: Market access gain is computed as a percentage change between the base scenario and the optimal speed scenario. The base scenario uses the optimal route covered at the average speed provided by Google Maps, while the optimal speed scenario covers the same route, but at a speed of 90 km/h. The first column shows access gains for routes with a maximum travel duration of 6 hours in each scenario. The second column includes the maximum access gain between both scenarios, without any restriction on travel time duration. The third and fourth columns calculate absolute gains in bordering market access as a difference between the base scenario and the optimal speed scenario, measured in millions of people. The last two columns show the absolute gain relative to the internal market magnitude. Data were drawn on April 15, 2021.

a/ Countries where the maximum travel time between any pair of internal locations is 6 hours, so the metrics for these cases are irrelevant.
b/ Countries where the maximum travel time between any pair of internal market cities and all the cities in bordering countries is 36 hours, so it was replaced by the metric of 12 hours of travel. For the rest of the countries, a 36-hour travel time metric was used.

Source: Authors based on Allub et al. data (2021).

When analyzing the maximum gains across all trip durations (fourth column), Colombia and Venezuela appear at the top of the list, followed by Peru and Bolivia. Thus, the poor quality of the road infrastructure and the consequent low travel speeds in these countries result in a significant loss of access to external markets. For Paraguay, these gains would be 11 times its domestic market and for Bolivia almost 10 times (column 6). For Central American economies, although their gains in absolute value are relatively small (except for Guatemala, which has Mexico as a neighbor), the gains in access to external markets are significant, representing almost 4 times their domestic market in the case of El Salvador and almost 2 times in Nicaragua and Honduras. In contrast, benchmark countries Spain and the United States show nearly null potential gains.

Measuring the impact of transport network investments on development: new data and new techniques

It is remarkably difficult to anticipate all the direct and indirect impacts that stem from a transport infrastructure intervention. Improving a link on a transport network results in changes to the relative transport costs of the whole network. In addition to these difficulties for *ex-ante analysi*s, the *ex-post causal* identification of impacts poses significant challenges. First, there is the reverse causality problem. Typically, the decisions about infrastructure location respond to already observed increasing traffic demand, which makes it difficult to identify how much of the higher transport flow is caused by the new infrastructure. Second, there are considerable displacement effects, albeit in the form of redirection of freight routes, or trade diversion. The causal identification of impacts from transport infrastructure improvements requires finding a suitable control group, which is almost impossible given the widespread presence of these indirect effects. Third, data are usually unreliable or inadequate for many of the expected transport infrastructure improvement areas, or, when data are available, the geographical aggregation for which they are available does not match the areas of influence of the transport interventions to be studied and their frequency is inadequate.

Despite all the difficulties mentioned above, there is a set of recent tools in economics that can address some of the barriers associated with transportation infrastructure analysis: quantitative spatial models, driven by the increasing availability of non-traditional data. These models explicitly include the underlying network structure to account for many of the indirect or aggregate impacts resulting from transportation interventions while being sufficient flexibles to be taken to the data and answer specific policy questions.

This report uses a standard quantitative spatial economic model to analyze two corridors in South America: the Santa Cruz-Puerto Suarez road corridor in Bolivia, and the Rosario-North-West corridor, in Argentina. These analyses highlight significant heterogeneous effects among the different locations considered. First, locations receiving a direct impact and those close to improved routes show better wages and increased population. However, both cases include locations that are negatively affected by these road infrastructure improvements. Some distant locations see their relative access to markets decrease after the intervention, simply because their connectivity improved less than the remaining locations. This leads to a loss of population to the winning locations and a drop in real wages. The use of this model demonstrates the importance of considering indirect effects when assessing transport infrastructure projects to better identify potential winners and losers.

Public policies to improve transport infrastructure investment management in support of integration

The evidence discussed in this report reveals that the quantity and quality of transport infrastructure services in Latin America are lagging. This is particularly significant for land infrastructure, including rail and road, and it is critical to reverse this trend to foster regional trade. Therefore, we should focus on the role public policies can play to improve the quality and coverage of transport infrastructure and increase market access to consumers and businesses in Latin America, and what the best future courses of action are.

To this end, the report begins by examining transport infrastructure investment in the region and how it fares when compared to high-performing regions. An analysis of budget lines for transport infrastructure investments shows that Latin American efforts are similar to countries in the European Union when considered as a percentage of GDP. However, this positions Latin America remarkably behind in its per capita investment levels: reaching per capita investment levels like the ones of developed countries would require expenditures of 9.2% of GDP of the region's economies on average.

This context of limited financial resources points to the importance of maximizing the impact of transport infrastructure investments in the region. Along these lines, the first aspect to consider is keeping a balanced investment matrix between budget lines for the preventive maintenance of existing infrastructure, the rebuilding of deteriorated infrastructure, and new projects. Preventive maintenance involves periodic, small-cap interventions to keep infrastructure condition at a consistently high level of quality, at the expense of requiring regular consistent spending. Rehabilitation refers to carrying out maintenance investments only when the transport services provided fall below a pre-defined acceptable level. Finally, full depreciation and replacement refer to earmarking a minimum investment level during the infrastructure life cycle and replacing or substituting the infrastructure once the cycle comes to an end. The best strategy is contingent upon many factors, like the type of infrastructure, its construction characteristics, weather conditions, and traffic level, among others.

Infrastructure maintenance poses several challenges. On the one hand, it requires an updated record of the infrastructure condition. On the other hand, financing maintenance costs faces multiple challenges: political considerations, since the political leverage from each dollar earmarked for maintenance is typically lower than for new works; budget constraints, as maintenance spending is normally delayed in favor of spending on urgent needs; institutional issues, as there might be a time lag between those who make the infrastructure investment decisions and project life cycles; and capacity issues, as mentioned above, originating from lack of precise data to conduct a suitable assessment of the condition of existing infrastructure (Blazey et al., 2020). Finally, it is often easier to secure financing from international agencies for the construction of new projects than for maintenance investments (Rioja, 2013).

The second aspect to consider is adopting the concept of logistic corridors as a policy target. This concept emphasizes the value chains that should be supported by physical infrastructure from beginning to end. A logistic corridor is an interconnected complex of (physical and institutional) structures that form part of production and consumption spaces. It is a subset of transport and logistic infrastructure supporting the flow of one or multiple value chains.

The existence of a corridor is characterized by a stable functional relationship through different linking components (infrastructure, services, trade, and population flows, among others) and across many environments throughout its length (city and intercity sections, production and consumption nodes, borders, multimodal interconnection) (Farromeque Quiroz, 2018). In turn, the logistic corridor concept encompasses an area of influence that spans beyond the hubs or cities located along any given main route, also including smaller population and production centers that participate in the value chain, connected to the corridor through secondary or tertiary networks.

In response to the necessary improvements to transport and logistic services in general and in emerging countries in particular, agencies and institutions have developed investment strategies that target logistic corridors.[20] This focus on logistic corridor strategies as a policy target has also been in use by multilateral agencies and development banks. One such example is CAF —development bank of Latin America, which places logistic corridors at the center of its transport interventions, with an agenda comprising the production of data and knowledge, and prioritizing transport infrastructure interventions focusing on service provision improvement and value chain development support (AC&A et al., 2020; Barbero, 2019; Farromeque Quiroz, 2017a and 2017b).

The third and final aspect to consider is the relevance of regional coordination to maximize transport infrastructure investment impacts on trade and productive integration on a regional and global scale. The coordination of these investments among the different governments involved is crucial, as the goal is to improve the international connection between neighboring countries or countries from the same region. The gains from a new highway (or railroad) that dramatically reduces the costs and times of moving freight to a border are significantly lower or even negligible if on the other side of the border similar actions do not take place.

This coordination could be made easier via specific bilateral negotiations or deeper integration schemes that can create spaces for dialogue and cooperation among the national agencies dealing with these topics. These actions, in turn, may be more readily implemented if these agreements provide for the creation of funds to finance these investments jointly. Along these lines, several sub-regional integration agreements have launched initiatives of this type, such as the MERCOSUR Fund for Structural Convergence (*Fondo para la Convergencia Estructural del Mercosur, FOCEM*), CAN's Andean Road Infrastructure Committee, the Pacific Alliance Infrastructure Fund (PAIF) and the Mesoamerica Project. On a regional basis, the Union of South American Nations (*Unión de Naciones Suramericanas, UNASU*R) has absorbed the main component: the Initiative for the Integration of the Regional Infrastructure of South America (IIRSA) within the framework of the South American Council of Infrastructure and Planning (*Consejo Suramericano de Infraestructura y Planeamiento, COSIP*LAN).

The outcome of these initiatives of sub-regional funds to coordinate integration infrastructure investments has been lackluster, due to a lack of both government financial resources and the capacities to identify and evaluate joint projects. However, activities in the framework of COSIPLAN did make progress, partly thanks to the financial support and technical aid from the main multilateral development banks in the region (such as CAF and the IDB).

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20. For example, China's «Belt and Road Initiative» or the Trans-European Transport Network initiative (TEN-T).

Energy Integration

Energy represents a clear example of a «regional good», goods for which transport costs are so high that trade outside the region (or beyond neighboring countries) is almost prohibitive. In this case, geographic proximity facilitates the development of interconnection infrastructure that simply reduces the cost of transporting these goods or services in comparison to extra-regional exchanges. Electricity cannot be stored and must be transported through special interconnection infrastructures that become more expensive the longer the distance. It also requires coordination by national dispatch systems that may have different prices and operation rules. For this reason, electricity is a regional tradable good.

Electricity trading can potentially yield benefits from economies of scale in production and consequent cost reductions, improving security in the supply, reducing the impact of unanticipated shocks, and achieving better service quality and environmental protection. Energy integration processes can range from interconnection between electricity grids to wide-scale integration.

Progress toward regional energy integration in Latin America has been heterogeneous. Central America has taken a significant step forward with the formation of a regional electricity market and the completion of the physical interconnection between the six countries involved. South America, in contrast, has only achieved bilateral interconnections (more so in the Andean subregion than in the Southern Cone)[21] and the joint exploitation of shared resources, such as binational hydroelectric dams (mainly in the Southern Cone).

Although energy policy in many of the countries recognizes integration among their objectives, this goal has been quite difficult to implement in the region. One of the main obstacles is the issue of energy security. In some countries with a net deficit of energy products, the pursuit of energy security, meaning a country's economy is independent from external energy shocks, requires measures aimed at self-supply over those aimed at cheaper and more efficient options from neighboring countries. In addition, the regional trade blocs have institutional weaknesses or lack dispute-resolution mechanisms—another barrier to integration.[22]

The region has invested in electricity generation capacity to meet demand over the past decade. Between 2009 and 2019, there was a reduction in the ratio between maximum demand and power supply in all the countries, which may be an indicator of a lack of integration. However, this analysis also indicates that the integration of Central American countries has mitigated overall power needs by addressing maximum demand in countries where the capacity of response has been compromised in the past, such as Honduras.

One front where Latin American countries have made progress is in the incorporation of non-conventional renewable energies (NCREs) in their electricity systems, increasing their generating capacity. The countries of Central America have expanded this capacity over the last decade, with NCREs accounting for slightly over 20% of total electricity generation, while in the Southern Cone, this share is around 10%. While these indicators are comparable, or even better, than those in some developed countries like the U.S., they are still far from the levels of the European Union. Progress in Latin America in this area suggests that energy integration can serve to bolster the use of less-contaminating energy sources.
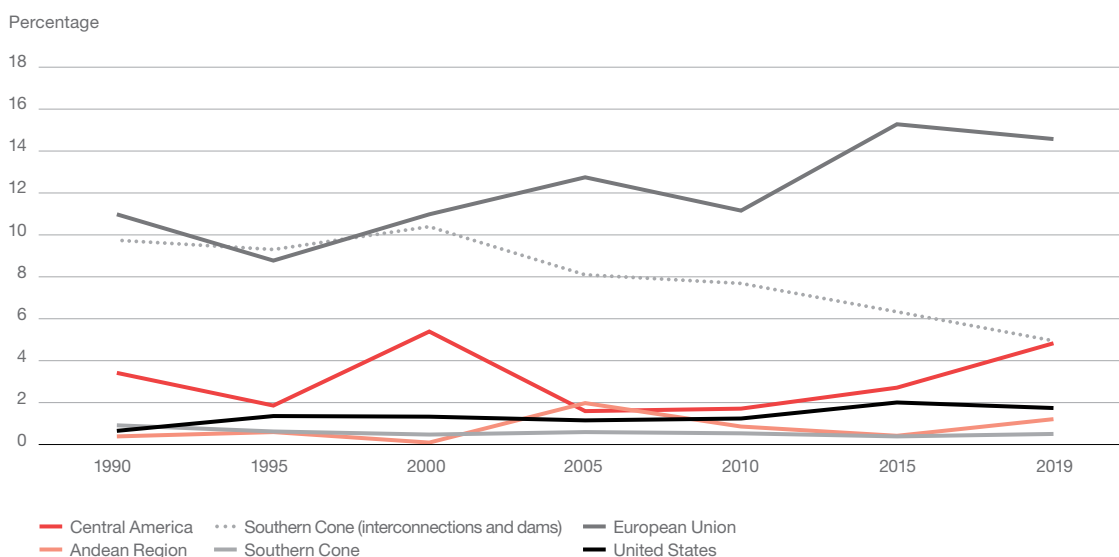
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21. In this report, the term Southern Cone encompasses a broader geographic area, including Brazil and Paraguay, in addition to Argentina, Chile and Uruguay.

22. The definition of stable and predictable rules, which provide legal security through dispute-resolution mechanisms, has been very hard to implement, particularly in the countries of South America.

Electricity trade flows in the region

The exchange of electricity in Latin America in recent years has been low, as shown in Graph 8. If the flows generated from the exploitation of common sources (binational hydroelectric dams) are included, electricity flows between countries oscillate between 5% and 10% of total consumption in the Southern Cone—far below those in the European Union (EU), where trade exceeded 14% of consumption in the past five years, although with country-specific differences. If the energy generated by binational dams is subtracted, only 0.5% of consumption came from transactions through interconnections. The Andean subregion was more active between 2005 and 2011 (1.3%) but then reduced trade to 0.4% of consumption in later years. In contrast, Central America recorded a growing volume of transactions once the Regional Electric Market (MER) went into operation, exceeding 4% of total consumption in the region between 2017 and 2019.

Graph 8
Electricity Imports

Percentage

Central America ···· Southern Cone (interconnections and dams) European Union
Andean Region Southern Cone United States

Notes: Values correspond to the ratio of electricity imported over total consumption. Total electricity consumption for the period 1990-2005 in Central America, the Southern Cone, and the Andean Region is calculated based on consumption information per capita from CAF and CIER (2012) and population data from the World Bank (2020b).

Source: Authors based on information from national statistics offices, CAF and CIER (2012), World Bank (2020b), EIA (2020), and Eurostat (2020).

In the analysis of the import-export balance for the years between 2009 and 2019, the evidence shows hardly any surplus or deficit in most countries, which can be interpreted as a prevailing energy security strategy in these economies, i.e., that no country wants exposure as a net importer.

The data on bilateral flows of energy trading can only be analyzed for South America, since, in the case of Central America, energy trading is through MER, which does not provide information on bilateral transactions. The conclusion based on these data is that electricity trading is limited in South America. This may be due to the limited capacity of the interconnections (extensive margin) or, on the contrary, may indicate underuse of installed resources (intensive margin). The evidence indicates that there is underuse in general of the intensive margin.[23] In all cases, the average use of interconnection capacity does not reach 10%, except between Ecuador and Colombia, where it is is at 30%. This information may be reflecting two things: on one hand, certain *ex-ante* optimism on trade in South America; or, on the other, national policies that promote energy security and hinder the implementation of solid regulatory frameworks (a low level of commitment and poor compliance mechanisms) for electricity exchange, leading to trade flows focused on spot exchanges under agreements between governments.

Drivers of energy integration

Based on the information available for South American countries, a gravity trade model for energy exchange can be estimated to identify the drivers that enable or hinder electricity trade in this region. The results of this exercise are shown in Graph 9. This evidence suggests, in the first place, that the relationship between electricity flows and economic activity is positive, with the GDP dynamics having a greater impact in the destination country (Panel A). These results are consistent with those observed for the trade of goods as well as those obtained by Batalla et al. (2019) for the European electricity system.

In the second place, since these are mainly spot exchanges between countries, the flows observed obey the conditions of relative scarcity captured mainly by importer country spot prices.[24] Likewise, as would be expected, the less distance the more exchanges, thus suggesting that the costs of interconnection decrease with geographic proximity.
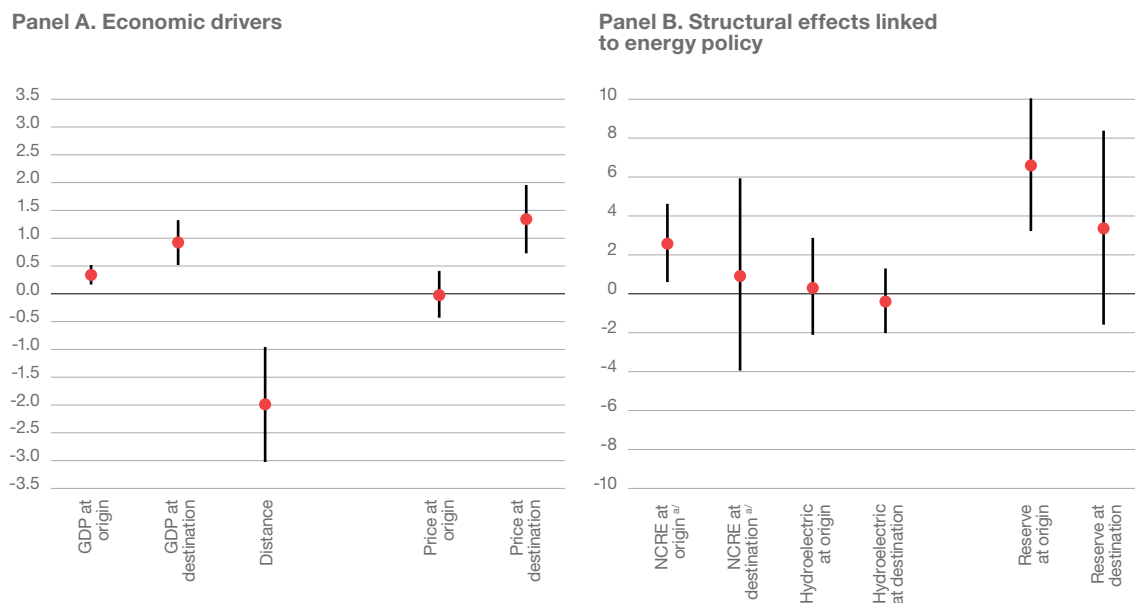
In the third place, bilateral exchanges seem to be guided by a combination of structural conditions of the respective electricity sectors (Panel B). In particular, a higher level of electricity exports in countries that have invested relatively more in NCREs is observed. These investments favor the optimization of resources and environmental sustainability in the countries involved in electricity exchanges (the most notable case being Uruguay). A positive relationship with the exporter country's system reserves is also observed.[25] All these results point to energy exchanges being driven by demand (activity and prices), as long as supply conditions are favorable (less costly energy sources, with available capacity in exporter countries).

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23. With the exception of flow from Venezuela to northern Brazil (until its interruption in 2019).

24. In a configuration that excludes structural components associated with the countries' energy policies, the price-elasticity of the country of origin is approximately -0.5.

25. In this case, it refers to a proxy variable, since it is possible that a system could have limited reserves at times of peak demand, but much more leeway the rest of the time and thus be able to export during periods when there are no capacity restrictions.

Graph 9
Drivers of electrical exchange in South America

Panel A. Economic drivers   **Panel B. Structural effects linked
                                                 to energy policy**

Notes: Coefficients shown for factors determining electrical exchange estimated using the Poisson pseudo-maximum likelihood method, with confidence intervals of 90%, data from the 2009-2019 period.

a/ NCRE refers to non-conventional renewable energy sources.

Source: Authors based on Cont et al. (2021).

It is interesting to analyze the effect that the energy integration process had on price level and volatility in the case of Central America. As mentioned before, the most developed energy integration processes, such as the Central American Electrical Interconnection System (SIEPAC, for its acronym in Spanish), could reduce price levels by reaching economies of scale. This is due to the fact that greater energy cost reductions can be achieved through planning and execution of regional-scale investments (that would not be profitable at a national scale) and coordination between national and regional dispatches (whereby regional network backup supply can allow investments to be postponed or avoided). At the same time, scheduled energy dispatch allows the cheapest sources to be leveraged among all those available in the region. Furthermore, these integration processes help to reduce price volatility through risk mitigation associated with the random nature of different energy sources, like hydroelectric (related to rain or drought climate events) or NCREs. Consequently, supply gaps can be more readily resolved during peak demand in the different systems, even during the day. This also promotes environmental sustainability (protecting the environment and combating climate change), leveraging the coordinated dispatch of electricity generated by countries that can resort to non-conventional renewable energy sources or those with lower carbon emissions (e.g., hydroelectric) at competitive prices.

In line with the theoretical arguments put forward in the case of SIEPAC, a convergence of electricity spot pricing over the long term in the MER member countries in Central America can be observed. Furthermore, reductions in production costs are reflected in a fall in the relative price of electricity to fossil fuels (natural gas and oil).

Political, institutional, and regulatory challenges of energy integration in Latin America

Regional electricity exchanges, ranging from the most basic to the most sophisticated, require a minimum of coordination between the countries involved, mostly regarding different degrees of harmonization among national regulations, the potential creation of regional entities with a greater or lesser delegation of authority and hierarchy, and the design of dispute-resolution mechanisms.

In the case of Central America, along with the development of the Regional Energy Market (MER) came a variety of concerns about the resilience of this market to external events and the viability of the long-term contracts that could be generated within this scheme in the face of prioritization of national markets. One of the first obstacles is that, despite the fact that the MER's rules and regulations give supply priority to firm contracts, national regulations have prioritized situations of national scarcity, so no contracts have exceeded one year.[26] Another concern in the context of MER is the effective use of capacity and its implications with regard to planning the expansion of the regional transmission system. The third challenge comes with the expansion of generating capacity. The MER anticipates the development of power generation on a regional scale, however, expansion planning has only happened at the national level so far.

In the Andean Community, the regional institution is responsible for supra-national regulations corresponding to intra-community transactions of electricity among its member countries. Initially, they produced the General Framework for the Subregional Interconnection of Electricity Grids and Intercommunity Electricity Trading and created the Andean Committee of Regulatory Bodies of Electricity Services. This committee was in charge of regulating transactions in the context of the Andean regional electricity market, subject to the prioritization of the member countries' internal supply. However, this decision was suspended and, in practice, binational exchanges were implemented through temporary regimes that prioritized self-sufficiency and permitted short-term exchanges of surpluses originating from coordinated dispatches.[27]

In the rest of South America, interconnection agreements have been of a bilateral nature. In the case of Mercosur, there is a Memorandum of Understanding Related to Electricity Exchanges and Integration. This MoU agrees on principles of minimum symmetries related to non-discrimination among agents of different countries, free contracting, regulations in the electricity markets that provide for supply guarantees, etc. More recently, in December 2018, representatives of the electricity sectors from some countries in the region and different international[28] bodies signed a protocol to undertake a study of electrical interconnections in the Southern Cone (SIESUR initiative). This initiative is currently in the stage of identification and resolution of the principal barriers limiting the use of existing infrastructure and the formulation of opportunities and challenges for coordinated regional planning.

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26. The development of long-term transmission rights is currently under review.

27. More recently, progress has been made in the electrical integration of the Andean Community, beginning with the proposal to create the Andean Short-term Regional Energy Market (MAERCP), launched in 2017. The regulations for this market's operation are still in the development phase.

28. The countries involved were Argentina, Brazil, Chile and Uruguay, accompanied by representatives from the IBD, CAF, the Latin American Energy Organization (OLADE) and the Regional Energy Integration Commission (CIER).

Participation in value chains

The reduction in trade costs worldwide has promoted the fragmentation and internationalization of production, driving the creation and growth of global value chains. Participation in these chains means that inputs manufactured in one country are used for the production of other intermediate goods in other economies, which, in turn, export to others that produce the final goods. From this perspective, countries can occupy different places in the value chains for a given product or sector: exports of raw materials, intermediate inputs, or final goods. This process of production fragmentation is driven by profits from economies of scale and specialization and explains the significant increase in trade of intermediate goods in recent decades, which has an important regional component considering that these production chains can benefit from geographic proximity.

Participation in these value chains not only includes companies directly involved in foreign trade activities, whether they export their products or import parts needed for their production, but also includes domestic companies brought into the chain indirectly as providers or clients of the exporter and importer firms, respectively. Thus, as a company incorporates quality standards or requirements into a global value chain, the conditions of production may improve in companies that do not participate directly in these linkages. In this set of indirectly affected business activities, the role played by the service sector is particularly salient, since this is often how a product can be differentiated and add value to exports.
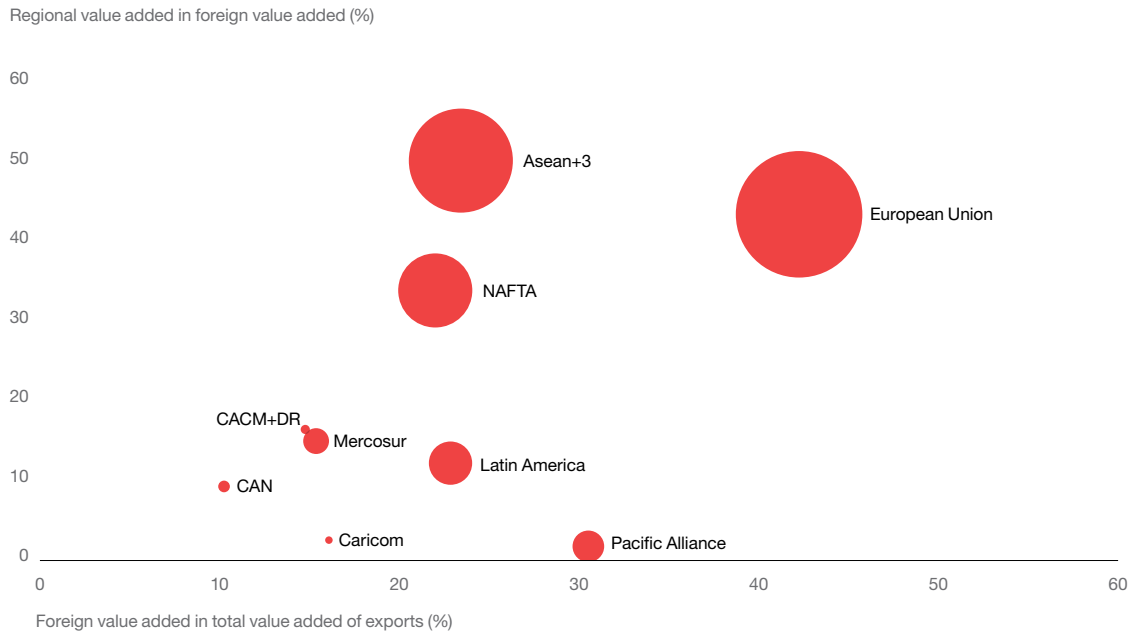
The insertion in value chains can be analyzed from the forward perspective, in which a country is studied as a provider of value added to other countries, or from a backward perspective, where a country is studied as a user of foreign value added during production. Likewise, value chains can be domestic, where all stages of production happen within the borders of the country; regional, where part of the production process and value added occurs in countries in geographic proximity; and extra-regional, where the intermediate or final stages of production take place in countries that are in extra-regional locations.

Graph 10 shows a backward-perspective estimate of participation by the different regions of the world in global value chains, and the importance of the production linkages at the regional level within those global chains. In particular, it illustrates the relationship between foreign value added to exported value added, and regional value added to foreign value added. A clearly positive correlation can be observed, suggesting that the use of imported inputs in total exports by the countries is very much determined by the provision of these inputs in the regional context; i.e., participation in global value chains has a significant regional component (Antràs and Gortari, 2020). This is clear in the case of the European Union, Asean+3, and NAFTA, where regional imported value added represents between 30% and 50% of imported value added incorporated in exports. The data for Latin America show less integration in regional value chains. For the set of countries in the region, imported value added is approximately 23% of the total value added of exports (not much different from NAFTA or Asean+3), but the share of imported valued added from the region is much lower (a little more than 10%).[29] Within Latin America, there is significant heterogeneity. The Central American Common Market, including the Dominican Republic (CACM+RD), is the subregion with the highest integration in regional value chains, followed by Mercosur and CAN. On the opposite end, the Pacific Alliance, despite being formed by more open economies (with a greater proportion of imported value added in their exports), shows nearly null integration in regional value chains.

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29. If Mexico is excluded from Latin America, the level of openness measured by the proportion of imported value added in exports falls by approximately 15 %, while the share of imported inputs sourced from the region increases (22%). This is intuitively explained by Mexico's high level of openness, even though it is heavily concentrated in trade with its NAFTA partners.

Graph 10

Relationship between the contribution of regional value added to foreign value added, and the contribution of foreign value added to total value added of exports per trade bloc, 2019

Regional value added in foreign value added (%)

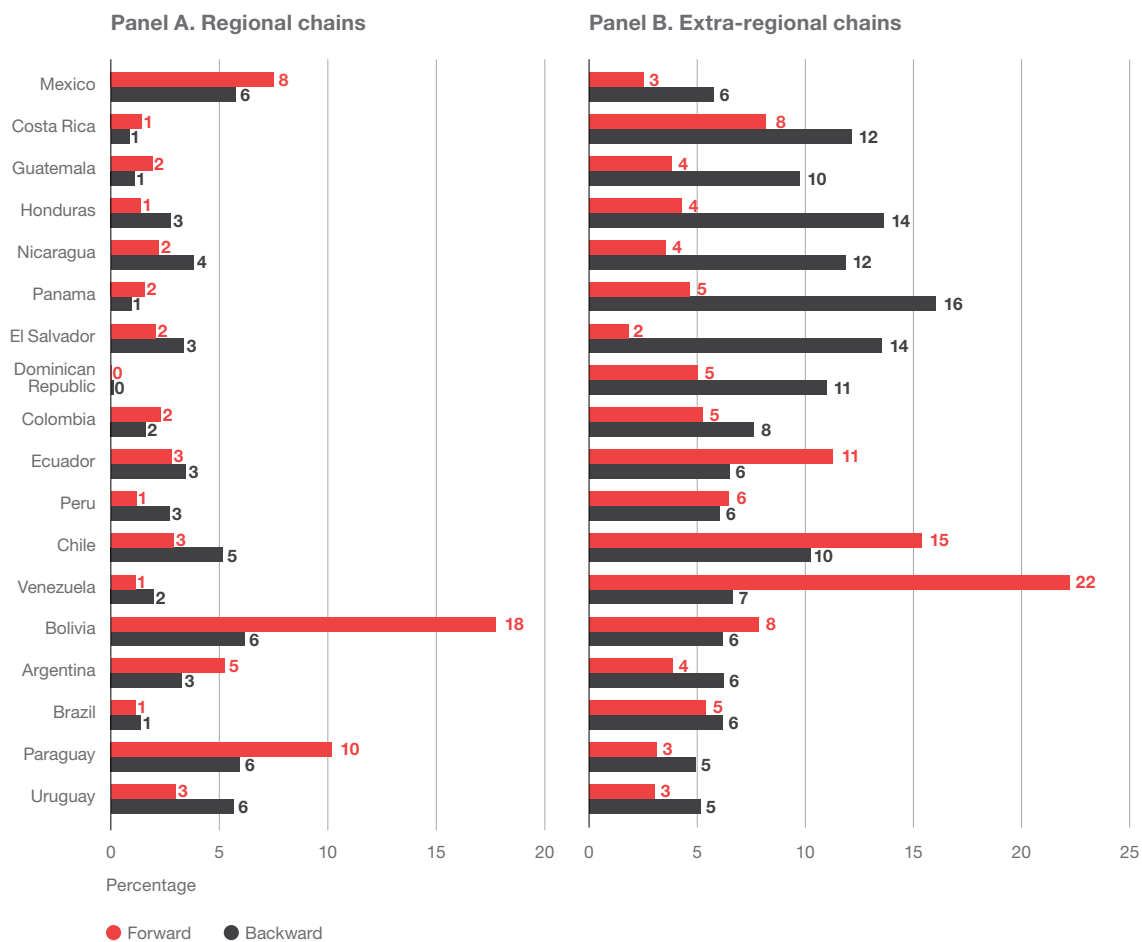

Foreign value added in total value added of exports (%)

Notes: The graph represents the relationship between the proportion of regional value added in foreign value added (Y-axis) and the percentage of foreign value added in total value added of exports (X-axis). Exports from the countries are composed of both domestic and foreign value added; in addition, the foreign value added can be regional (sourced from countries of the same region) or extra-regional (from countries outside the region). The size of the bubbles reflects the total exported value added (domestic and foreign) for each region.

Source: Authors based on Eora data (UNCTAD, 2020).

Graph 11 shows a more detailed analysis at the country level in Latin America of participation in global value chains (regional and extra-regional), from both backward and forward perspectives. In the first place, the results suggest that extra-regional chains are much more important than regional ones, as shown in Graph 10. In these extra-regional chains, the countries of Central America and Mexico also have backward participation, i.e., they perform final production processes and are mostly users of foreign value, while in South America, certain countries, such as Bolivia, Chile, Ecuador, and Venezuela, exercise forward participation through their mining and fossil fuel production; the rest have a more balanced position. The levels of participation in regional value chains are much lower, indicating that most countries hold balanced positions, with the exceptions of Bolivia and Paraguay, which show a strong forward bias.

Graph 11

Forward and backward participation in value chains as a percentage of VAB
per country, 2015

Panel A. Regional chains

Panel B. Extra-regional chains

● Forward   ● Backward

Notes: This graph shows forward and backward participation in regional (Panel A) and extra-regional (Panel B) value chains, measured as a percentage of gross value added per country. The forward perspective measures the proportion of value added in a country that is used as an input in production processes in other countries. The backward perspective measures foreign value added contained in the production of final products of a country.

Source: Authors based on Full Eora data (https://www.worldmrio.com/eora/).

As discussed earlier, this fragmentation of production not only affects companies directly involved in foreign trade activities but also those that do not export, yet are related to those that do. A particularly important sector is the service sector. Using information from input-output tables, indexes of service sector participation in the total value added of exported goods can be built, distinguishing within the service sector the contribution of financial and business services.[30] The existing evidence indicates

30. This division arises because the literature identifies financial and business services as a key input for export development and company performance, especially for developing countries.

that there is strong heterogeneity within the region, given that in some countries like Bolivia, Colombia and Costa Rica, services contribute over 30% of domestic value added in exports, and in others, like Peru, the contribution from this sector is barely more than 10%. In all countries used as benchmarks,[31] the service sector provides more than 25% of domestic value added. This heterogeneity also appears upon analysis of the composition of different service sub-sectors. Financial and business services contribute over 10% of domestic value added in Chile, Colombia, and Costa Rica, while in Bolivia and Peru, they contribute around 5%. In contrast, these services make up more than 10% of domestic value added in exports from developed countries, with New Zealand reaching values close to 25%.

In summary, services play an important role in the manufacture and export of goods and, in particular, can help to add value to a country's exports. At the same time, they can play a key role in the insertion of economies in extra-regional value chains, while also allowing this greater insertion to translate into productivity gains in the domestic economy.

Policies to promote the integration of production

Different possible actions can be taken to promote the integration of production. On one hand, there are the policies already discussed with regard to tariff and non-tariff measures, trade facilitation, both of goods and services, and improvements to transportation infrastructure. On the other hand, there are other policies, like rules of origin, policies aimed at promoting foreign direct investment (FDI), or special import regimes, also relevant when it comes to promoting participation by companies in regional and global value chains.

Rules of origin determine the conditions that a product must meet to be eligible for the preferential tariffs granted under trade agreements. Some of the following criteria are generally used to determine a product's country of origin: i) wholly obtained goods; ii) goods made exclusively from originating materials, and iii) substantial or sufficient transformation of inputs imported from third-party countries.[32]

Rules of origin can become a core determining factor of the possibility of integrating global value chains because they stipulate the relationship that must exist between input and output in the international trade operations under trade agreements. Very strict rules of origin can dissuade productive integration under a trade agreement if they require major national transformation and do not allow inputs from other partners to the agreement to be computed as domestic production in the case of exports to third-party markets. These regulations can also cause trade diversion in favor of countries belonging to a free-trade agreement, since there may be incentives for exporters to replace inputs sourced from providers outside the trade-agreement zone for partners under the agreement if the rules impose requirements at very high values.

One path to address the needs of countries in compliance with rules of origin requirements is to allow for accumulation among members of the agreement, i.e., that all originating materials of any country party to the agreement can be used by another as if they were national. An even more flexible requirement allows for diagonal accumulation, meaning that products from third-party countries with whom the two members of a trade agreement hold separate agreements are accepted as originating materials; this is far from being the rule in the region.

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31. The benchmark countries are Australia, China, Germany, Japan, New Zealand and the U.S..

32. Wholly obtained products are those found in nature, like live animals, plants, or minerals extracted in a country. Also included in this category are waste and waste by-products originating from manufacturing or consumption. Those obtained from originating materials require that the product be made completely in the territory of the agreement member-countries and that their production be exclusively from materials originating from those countries.

Another way of fostering productive integration is through the promotion of FDI, especially vertical since foreign companies are more likely to export, import, and engage in both activities simultaneously than domestic ones. At the same time, these companies can better resolve the integration of productive processes among countries in the region by installing plants that produce different inputs in the different economies, thus taking advantage of profits from economies of scale and specialization.

As with all investment, FDI benefits from stable political and economic environments, with legal systems that protect it and make it possible to realize the profits obtained. Openness that facilitates trade and, consequently, enables countries to import the necessary inputs and export production, play an important role in these investment decisions. Also important are the services provided by existing infrastructure, which allow goods to be easily produced and transported without incurring high logistical or storage costs. Another significant factor determining the localization of companies and the degree to which an economy may benefit from foreign direct investment is the level of human capital since this can be a fundamental input for companies and a key determining factor when it comes to the domestic economy's potential to appropriate part of the profits generated by the foreign company. The development of financial markets is another crucial factor for domestic companies to be able to take advantage of all the profits stemming from the FDI and to prevent credit displacement by foreign companies. Programs to incentivize and develop domestic providers can also help to capitalize on attracting FDI for domestic firms, making their productive processes more sophisticated and efficient.

Finally, special import regimes are often used by the vast majority of Latin American countries. These regimes allow inputs to be imported tariff-free, provided they are used to produce goods for export. Based on data for Argentina and Uruguay, a high incidence of imported inputs in sectors that take intense advantage of these programs is observed and, therefore, the application of these programs could be a key factor when it comes to greater productive integration.

Institutional constraints to sustain integration policies

Latin America has made progress in its strategy for international integration through significant efforts to open trade in the past 30 years. This push has combined strategies of unilateral liberalization during the '80s and '90s with multilateral negotiations, such as the incorporation of several countries in the GATT, and regional agreements established in the mid-nineties that gained momentum during the first decade of the 2000s. In the beginning, these treaties were focused on renewing or creating sub-regional initiatives, which later were extended to bilateral FTAs (led by Chile and Mexico) that covered ties between countries of the region not encompassed in these arrangements. This push toward regional integration led to 33 agreements, which in practice cover approximately 85% of trade across Latin America and the Caribbean (Mesquita Moreira, 2018). Simultaneous to this process, several countries signed North-South agreements, the most emblematic of which was NAFTA in 1994, partnering Mexico with its neighbors to the north (recently replaced by the USMCA).

Despite all these efforts, the results in terms of the region's participation in international trade, measured by its share of global exports, have not been stellar. In addition, even though measuring the impact of trade on growth poses a major challenge (Pavcnik, 2017), available estimates suggest that there have been positive impacts (Estevadeordal and Taylor, 2013; Mesquita Moreira et al., 2019), albeit perhaps not on the scale expected.

This report emphasizes that these less-than-stellar results are explained in part by the fact that businesses, mainly medium and small enterprises (SMEs), have not taken full advantage of regional markets to integrate commercially and productively, which would provide them with opportunities to grow sales and jobs. The reasons for this shortcoming are attributable to the partial progress (and in some cases, regression) in various trade liberalization policies.

The integration agenda can be summed up in three aspects. First, the reduction in tariffs applied unilaterally, which in some cases remains high (notably in Caricom and Mercosur) and is incompatible with a strategy of open regionalism; this must be complemented by bilateral or plurilateral negotiations at the subregional level to complete tariff reductions between countries and subregions. Beyond these traditional initiatives of liberalization, two other critical aspects require action. One is the need to work on reducing customs and border costs, and on substantive improvements in transportation infrastructure to facilitate physical integration across countries, including energy infrastructure. The other is related to domestic and regional regulations (e.g., rules of origin) that facilitate productive integration between economies, promoting participation by companies in global value chains that, as shown, have an important regional component. Both types of measures favor exchange of inputs and intermediate goods, which in turn foster specialization and gains in productivity.

The distributive impacts of trade openness

What are the institutional and political constraints that could derail progress in these policies? In the first place, it is fair to mention that in the cases where subregional FTAs have experienced delays in their development, or even setbacks (such as Mercosur and CAN), this has been due in part to the negative impacts of macroeconomic crises on trade policies, both unilateral ones as well as those established under agreements. Ideological issues and political volatility have also gotten in the way of consensus on measures between countries to reduce barriers and expand trade.

Aside from these situation-specific reasons, there are more structural factors that could unleash resistance to measures aimed at opening trade and integration. Although theoretical and empirical evidence suggest that trade openness and integration policies have a positive effect on productivity and income at an aggregate level on economies or regions, a key aspect that also has theoretical and empirical backing is that these benefits are not equally distributed across the different economic stakeholders participating in these initiatives. In particular, openness and increased trade can have distributive consequences among sectors that are more or less exposed to international competition, among workers with different levels of education, or even among countries of different sizes that decide to establish an integration initiative.

These sector and distributive consequences of trade openness, in addition to generating resistance to these policies by stakeholders directly impacted, can weaken public perception in general of the benefits of integration policies. The evidence in this regard based on surveys suggests that, while the majority of the population in developed and developing countries recognize trade openness as a good thing, they also admit that it could negatively impact employment and salaries in certain sectors (Mezquita Moreira et al., 2019; Pavnick, 2017). It is therefore not surprising that these distributive consequences and perceptions can lead to political pressure in favor of measures to prevent trade openness, whether unilateral or in the context of FTAs.

The proper response to these fears and sector-based pressures that could potentially frustrate (or cause setbacks) in trade openness are compensation programs. These programs can be in the form of worker-training policies and productive capacity-building in companies and sectors that may be adversely impacted. Another important aspect is that these trade openness processes, particularly

when established in the context of trade agreements, must be gradual in order to allow time for companies and workers to adjust to the new context of greater competition and thus be able to take advantage of the new opportunities boosted by economic integration.

State capacities to uphold policies of international integration

To what extent have these political economy considerations (motivated by distributional issues) affected—or could negatively impact—the countries' institutional capacities to move forward with the agenda of regional and global integration measures outlined above?

Tariff measures are the most contentious. However, in the majority of countries tariff barriers and other NTBs have been substantially reduced under multiple agreements made within the region and with partners from abroad. These tariff reductions need to be complemented by trade facilitation policies, logistics and infrastructure, as well as productive integration initiatives, so trade opportunities can trickle down through the productive network of the region's economies. This is a much more pragmatic agenda, less subject to ideological arguments and, therefore, less contentious.

The effective implementation of this agenda still requires important public capacities and coordination within the public sector, with the private sector, and among governments. To facilitate trade, practical measures must be implemented to simplify and digitize the different types of processes and procedures that delay and make compliance with customs and border requirements more expensive. To do this requires coordination across different government agencies that act on foreign trade operations, unifying records and fostering the interoperability of information systems and control. Moreover, these information systems that support foreign trade procedures can be converted into sites that provide other types of financial services and business consulting to companies, particularly SMEs, for whom foreign trade transactions are always more complex and costly.

As for interventions to reduce the costs of transportation, logistics and infrastructure that facilitate physical connections between countries, this requires public capacities to design, evaluate and implement investment projects. These infrastructures not only serve to connect countries, but to also link production sites within the countries with international connection nodes (ports, airports, and border crossings). In addition, this not only means building new roads and ports but also that these investments should receive adequate maintenance. At the same time, when improving international connections between neighboring countries, it is very important to coordinate these investments among the different governments involved (so that, for example, the complementary internal infrastructure is also built). This coordination could be facilitated through specific bilateral negotiations or the existence of deeper integration schemes to create institutional arrangements that foster dialogue and collaboration among the different national agencies in charge of these areas. These actions could be further facilitated if agreements provide for the creation of funds for joint financing of these investments.[33]

With regard to measures to facilitate productive integration, this requires the standardization among the different countries of their regulations regarding domestic content requirements or rules of origin. It also requires that they coordinate incentives that promote vertical FDI, that favor the creation of regional and global value chains and regimes that facilitate the importation of inputs destined for

33. Several subregional agreements have launched initiatives of this kind, such as the Mercosur Fund for Structural Convergence (FOCEM), the Andean Committee on Road Infrastructure in CAN, the Pacific Alliance Infrastructure Fund (FIAP), and the Mesoamerica Project.

export products. This coordination is crucial among countries that belong to FTAs since they must aim to foster productive specialization and increased production of value added in intraregional trade and with third-party countries, without creating obstacles to internal commerce or regulations that cause trade to be rerouted. As mentioned before, this can be facilitated through rules of accumulation regarding national content requirements among the member countries of an agreement. However, to put these rules into practice, the mechanisms of integration must be more robust and prevent unilateral policies (for instance, the establishment of duty-free zones that weaken the concession of preferential tariffs to neighboring countries or that disregard aspects of rules of origin). In this regard, the institutions that coordinate these policies within trade agreements need to be strengthened, particularly those that oversee compliance with the commitments that countries have assumed.

Finally, the continuity of all these policies must be ensured over time, despite changes of government, and their design and implementation coordinated with the private sector, without allowing private interests to steer these policies away from their objectives. The creation of Productivity Commissions composed of government and private sector representatives could help to meet these objectives. These institutions must have the technical capacities to provide opinions and recommendations based on evidence that may not be binding but help to shape the public discussion regarding the design and implementation of such trade openness policies. Alternatively, the countries could form sectorial boards to discuss different aspects of trade openness policies and regional agreements, including representatives from the export activities and those that compete with imports, which could potentially incur costs related to these initiatives. Providing visibility to potential winners and losers of these policies helps to generate consensus around actions that could allow these new productive opportunities to be leveraged. At the same time, such visibility makes it possible to design programs aimed at moderating the negative effects on sectors that must transform in order to be competitive in the new scenario of a more open economy.

This domestic institutional framework in charge of coordinating and sustaining collaboration with the private sector over time is complementary to the aforementioned strengthening of the institutional framework of supra-national agreements, such as Mercosur, CAN, the Pacific Alliance, CACM, and Caricom. Such agreements help generate support and overcome interests opposing policies of integration. However, experience has shown that, without a clear alignment of national interest in favor of these policies, progress is weakened.

In summary, successful integration processes require the institutional framework and state capacities for their design and implementation. These must be aligned with the interests of the sectors that will benefit from these policies and, at the same time, serve to reduce the costs for the activities that could face greater competition. All this requires resources and coordination across different state agencies, the private sector and the involved national governments.

References

AC&A, CAF and Cenit. (2020). *Análisis de inversiones en el sector transporte terrestre interurbano latinoamericano a 2040*. Panama City: CAF. Retrieved from https://scioteca.caf.com/handle/123456789/1537

Allub, L., Caro, A. and Juncosa, F. (2021). *Spatial economic modelling for the appraisal of transport infrastructure projects in Latin America* [Unpublished document]. CAF.

Antràs, P. and Gortari, A. (2020). On the geography of global value chains. *Econometrica*, *88*(4), 1553-1598. https://doi.org/10.3982/ECTA15362

Barbero, J. A. (2019). *IDEAL 2017-2018: Infraestructura en el desarrollo de América Latina*. Caracas: CAF. Retrieved from https://scioteca.caf.com/handle/123456789/1465

Batalla, J., Paniagua, J. and Trujillo-Baute, E. (2019). Energy market integration and electricity trade. *Economics of Energy & Environmental Policy*, *8*(2). https://doi.org/10.5547/2160-5890.8.2.jbat

Blazey, A., Gonguet, F. and Stokoe, P. (2020). Maintaining and managing public infrastructure assets. In Schwartz, Gerd, Manal, Fouad, Hanse, Torben S., and Verdier (Eds.), *Well spent: how strong infrastructure governance can end waste in public investment* (p. 344). Washington, D.C.: International Monetary Fund.

Bureau of Transportation Statistics (BTS). (2021). U.S. International freight trade by transportation mode. Retrieved May 1, 2021 from https://www.bts.gov/browse-statistical-products-and-data/freight-facts-and-figures/us-international-freight-trade

CAF and CIER. (2012). *Nuevas oportunidades de interconexión eléctrica en América Latina*. Bogotá: CAF. Retrieved from https://scioteca.caf.com/handle/123456789/418

CEPII. (2020). *BACI: International Trade Database at the Product-Level.* [Database]. Retrieved from http://www.cepii.fr/cepii/en/bdd_modele/presentation.asp?id=37

Cont, W., Barril, D. and Carbo, A. (2021). *Comercio de electricidad en América del Sur, un análisis a partir de la ecuación de gravedad* [Unpublished document].

ECLAC. (2019). *Perspectivas del comercio internacional de América Latina and el Caribe 2019: El adverso contexto mundial profundiza el rezago de la región*. Economic Commission for Latin America and the Caribbean. Retrieved from https://www.cepal.org/es/publicaciones/44918-perspectivas-comercio-internacional-america-latina-caribe-2019-adverso-contexto

EIA. (2020). US Energy Information Administration [Database]. Retrieved October 12, 2020 from https://www.eia.gov/totalenergy/data/browser

Estevadeordal, A. and Taylor, A. M. (2013). Is the Washington Consensus dead? Growth, openness, and the great liberalization, 1970s–2000s. *Review of Economics and Statistics*, *95*(5), 1669-1690. https://doi.org/10.1162/REST_a_00358

Ethier, W. J. (1998). The New Regionalism. *The Economic Journal*, *108*(449), 1149-1161. https://doi.org/10.1111/1468-0297.00335

Eurostat. (2020). European Statistical Recovery Dashboard [Database]. Retrieved December 10, 2020 from https://ec.europa.eu/eurostat/data/database

Farromeque Quiroz, R. (2017a). *PERLOG países: Argentina, Bolivia, Colombia, Ecuador, México, Panamá, Paraguay, Peru and Uruguay*. Bogotá: CAF. Retrieved from https://scioteca.caf.com/handle/123456789/1023

Farromeque Quiroz, R. (2017b). *PERLOG-LATAM: Perfil logístico de América Latina*. Bogotá: CAF. Retrieved from https://scioteca.caf.com/handle/123456789/1022

Farromeque Quiroz, R. (2018). *Corredores logísticos de integración: Una estrategia de intervención*. Presentado en *Infraestructura para el desarrollo de América Latina*, Buenos Aires, Argentina. Retrieved from http://www.sela.org/media/3211915/corredores-logisticos-de-integracion.pdf

Frankel, J. A. (1997). *Regional trading blocs in the world economic system*. Washington, D.C.: Institute for International Economics.

Garriga, M. and Sanguinetti, P. (1995a). ¿Es el Mercosur un bloque natural?: Efectos de la política comercial and la geografía sobre el intercambio regional. *Estudios*, *18*(73), 59-68.

Garriga, M. and Sanguinetti, P. (1995b). The determinants of regional exchange in Mercosur: Geography and trade liberalization. *Universidad Torcuato Di Tella, Working Paper*, *16*. Retrieved from https://aaep.org.ar/anales/pdf_95/Garriga-Sanguinetti.pdf

Krugman, P. (1991). The move toward free trade zones. *Economic Review*, *76*(Nov), 5-25. Retrieved from https://www.kansascityfed.org/documents/826/1991-The%20Move%20Toward%20Free%20Trade%20Zones.pdf

Maldonado, H. and Pérez, G. (2020). *Integración regional and facilitación de la logística en América del Sur* (International Trade Series, No. 151-LC/TS.2019/107). Santiago, Chile: Economic Commission for Latin America and the Caribbean (ECLAC). Retrieved from https://www.cepal.org/es/publicaciones/45062-integracion-regional-facilitacion-la-logistica-america-sur

Mercados – Aries Internacional. (2021). *Estudio de integración energética en América Latina. Una visión de desarrollo al 2040*. CAF. Retrieved from https://www.caf.com/media/2210151/bases-de-precalificacion-integracion-energetica-en-america-la.pdf

Mesquita Moreira, M. (2018). *Conectando los puntos: una hoja de ruta para una mejor integración de América Latina and el Caribe*. Banco Interamericano de Desarrollo. Retrieved from https://doi.org/10.18235/0001132

Mesquita Moreira, M., Stein, E. H., Li, K., Merchán, F., Martincus, C. V., Blyde, J. S., … Chatruc, M. R. (2019). *De promesas a resultados en el comercio internacional: lo que la integración global puede hacer por América Latina and el Caribe*. Inter-American Development Bank.

Moncarz, P., Flores, M., Villano, S. and Vaillant, M. (2021). *Determinantes de los niveles de integración regional en las dos últimas décadas* [Working paper]. CAF. Retrieved from https://scioteca.caf.com/handle/123456789/1790

United Nations. (2021). UN Comtrade Database [Database]. Retrieved June 1, 2021 from https://comtrade.un.org

OECD. (2018). *Trade facilitation and the global economy*. Organisation for Economic Cooperation and Development. Retrieved from https://doi.org/10.1787/9789264277571-en

OECD and WTO. (2020). Conjunto de datos equilibrados sobre el comercio de servicios (BaTiS) [Database]. Retrieved June 1, 2021 from https://www.wto.org/spanish/res_s/statis_s/trade_datasets_s.htm

Pavcnik, N. (2017). *The impact of trade on inequality in developing countries* (N.o w23878; p. w23878). Cambridge, MA: National Bureau of Economic Research. Retrieved from https://doi.org/10.3386/w23878

Planzer, R., and Pérez, G. (2019). Infraestructura aeroportuaria en América Latina and el Caribe. *Boletín FAL*, *370*(2). Retrieved from https://www.cepal.org/es/publicaciones/44900-infraestructura-aeroportuaria-america-latina-caribe

Rioja, F. (2013). What is the value of Infrastructure maintenance? A survey. In G. K. Ingram and K. L. Brandt (Eds.), *Infrastructure and land policies* (pp. 347-365). Cambridge, MA: Lincoln Institute of Land Policy. Retrieved from https://www.lincolninst.edu/publications/conference-papers/what-value-infrastructure-maintenance

Sánchez, R. and Weikert, F. (2020). Logística internacional pospandemia: análisis de la industria aérea and la de transporte marítimo de contenedores. *Boletín Marítimo y Logístico CEPAL*, (72). Retrieved from https://www.cepal.org/sites/default/files/news/files/boletinmaritimo72_esp.pdf

Teti, F. (2020). *30 years of trade policy: evidence from 5.7 billion tariffs* (ifo Working Paper, No. 334). Retrieved from https://www.econstor.eu/bitstream/10419/222855/1/1726142590.pdf

UNCTAD. (2017). *Review of maritime transport 2017*. United Nations. Retrieved from https://www.un-ilibrary.org/content/books/9789213628089

UNCTAD. (2020). *Eora Global Value Chain Database*. Retrieved from https://worldmrio.com/unctadgvc/

UNCTAD. (2021). UNCTADstat [Database]. Retrieved June 1, 2021 from https://unctadstat.unctad.org/

World Bank. (2020). Doing Business [Database]. Retrieved November 15, 2021 from https://espanol.doingbusiness.org/es/data/exploretopics/trading-across-borders

World Bank. (2020b). World Development Indicators (WDI) [Database]. Retrieved November 15, 2020 from https://datos.bancomundial.org/indicator

World Bank. (2021). Estadísticas demográficas: población. Retrieved July 1, 2021 from https://datos.bancomundial.org/indicator/SP.POP.TOTL

WTO. (2021). World trade primed for strong but uneven recovery after COVID 19 pandemic shock [Press release]. Retrieved September 3, 2021 from https://www.wto.org/english/news_e/pres21_e/pr876_e.htm

WTO and UNCTAD. (2020). Merchandise and Services Annual Dataset [Database]. Retrieved June 1, 2021 from https://www.wto.org/spanish/res_s/statis_s/trade_datasets_s.htm

Over the last 30 years, most Latin American countries have unilaterally and multilaterally implemented trade liberalization policies within the framework of regional and extra-regional trade agreements. These policies have resulted in a reduction of tariffs and non-tariff barriers, generating increases in trade and investment levels. However, the magnitude of these increases has been modest and does not match expectations of their impact on growth and welfare. One reason for this is that the aforementioned liberalization measures did not generate significant and sustained increases in intraregional trade.

This report explores the hypothesis that the low international insertion of Latin American companies is due, in part, to the limited use of the regional space as a complement to a strategy of global export expansion. This hypothesis focuses on the feedback and benefits between regional and global openness, or what has come to be known as open regionalism. To achieve greater regional and global integration, the report proposes initiatives in three specific areas: trade facilitation, physical infrastructure, and productive integration.

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