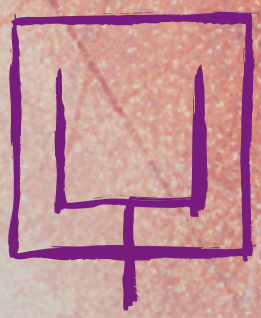

2018

Foreign Direct Investment
in Latin America and the Caribbean

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Explanatory notes

- Three dots (…) indicate that data are missing, are not available or are not separately reported.
- A dash (-) indicates that the amount is nil or negligible.
- A full stop (.) is used to indicate decimals.
- The word "dollars" refers to United States dollars unless otherwise specified.
- A slash (/) between years (e.g., 2013/2014) indicates a 12-month period falling between the two years.
- Individual figures and percentages in tables may not always add up to the corresponding total due to rounding.

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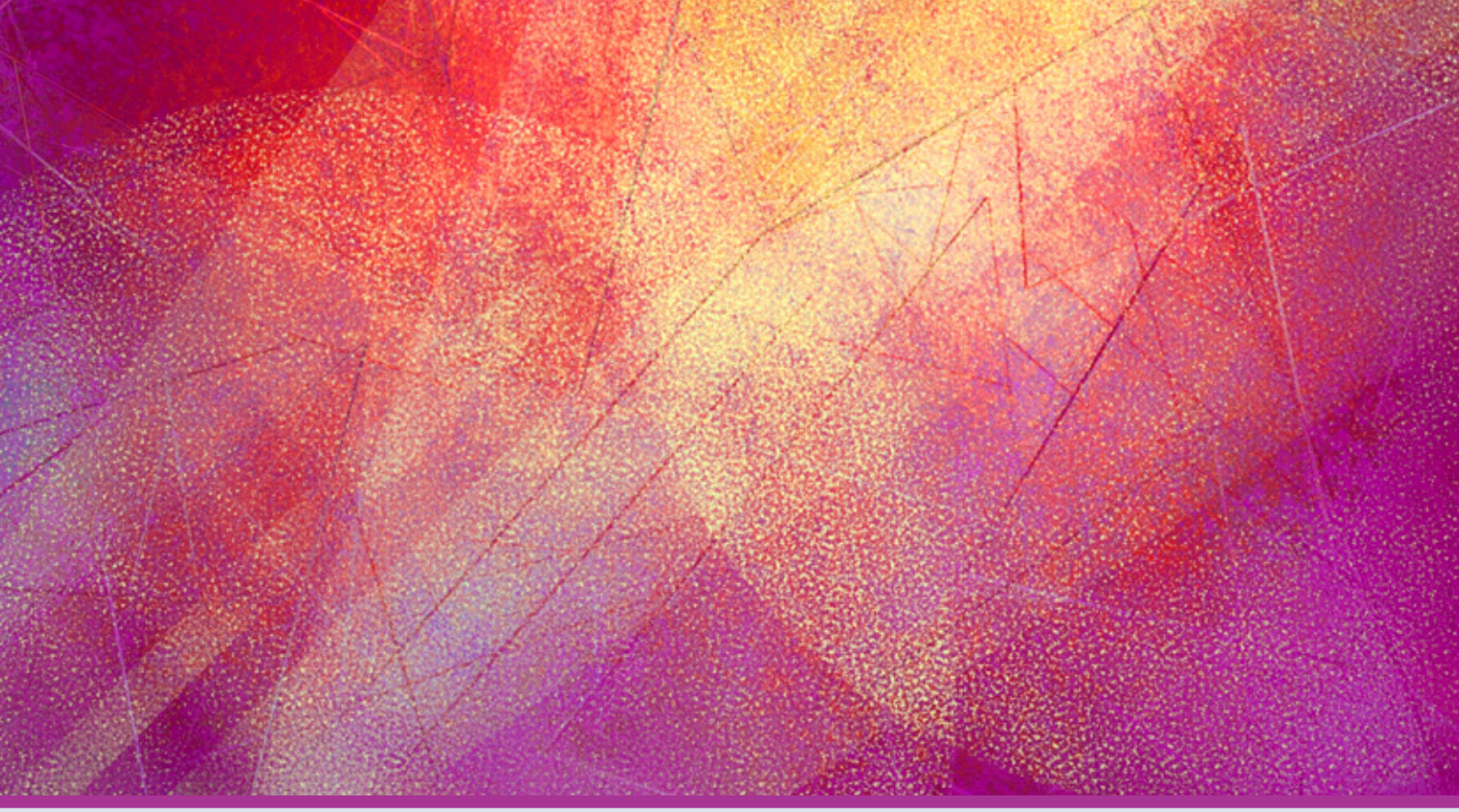


Executive summary

A. Foreign direct investment in Latin America and the Caribbean

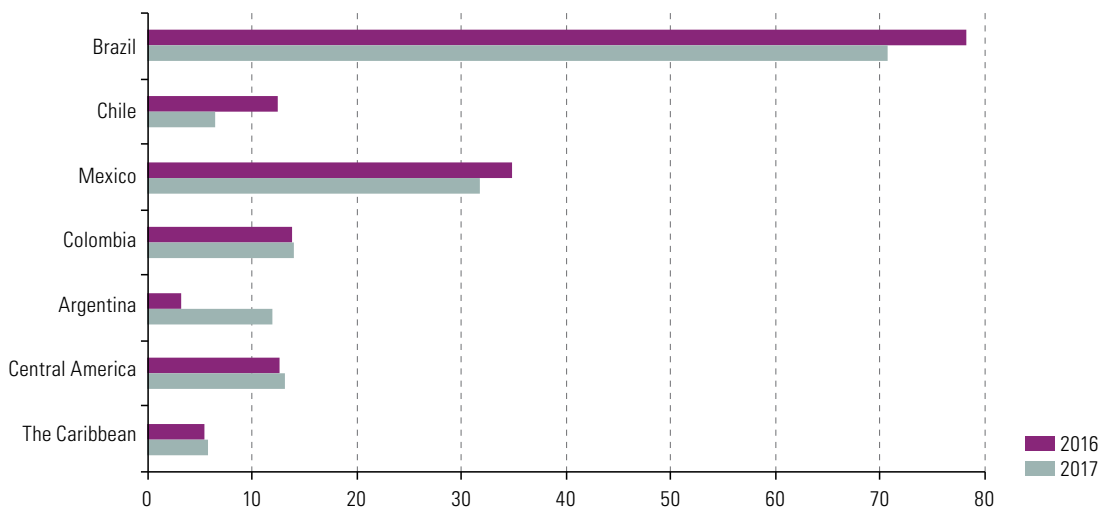
In 2017, certain trends that had already emerged in the global economic landscape became more established. In particular, announcements of potential restrictions on trade and pressures to relocate production to developed countries were confirmed. At the same time, China has taken steps to restrict outflows of foreign direct investment (FDI) in order to align these flows with its strategic plan. Adding to these factors is the expansion of digital technologies, whose international expansion requires smaller investments in tangible assets. Firms in these areas are heavily concentrated in the United States and China, which reduces the need for cross-border mergers and acquisitions.

The combination of these factors goes some way to explaining the drop in global FDI in 2017, even amid stronger global economic growth (3.2%), abundant international liquidity, high corporate returns and optimism in the financial markets. In this international context, FDI flows to Latin America and the Caribbean contracted for the third year in a row in 2017, to US$ 161.911 billion, 3.6% down on the 2016 figure and 20% less than in 2014.

In the medium term, this steady fall since 2014 may be attributed to the fall in export commodity prices, which has significantly reduced investment in the extractive industries, and to the economic recession in 2015 and 2016, which was concentrated in Brazil. These two trends were partially reversed in 2017, however, when the region returned to growth (1.3% of GDP) and prices for oil and metals picked up. This uptick in prices raised the returns on investment after several years of declines, which also encouraged reinvestment of profits, albeit not enough to make up for the fall in FDI in the extractive industries. Today, in countries for which data are available, FDI inflows into the primary sector are just a third of what they were in 2011 and 2012. Conversely, in the services sector inflows fell by just 11%, and in manufacturing they held steady.

While in 2016 FDI inflows were down in the majority of the countries in the region, in 2017 FDI rose in most of them and the downturn was concentrated in Brazil (where inflows were down 9.7%), Chile (down 48.1%) and, to a lesser extent, Mexico (see figure 1).

Figure 1
Latin America and the Caribbean (selected countries and subregions): inflows of foreign direct investment (FDI), 2016–2017
(Billions of dollars)



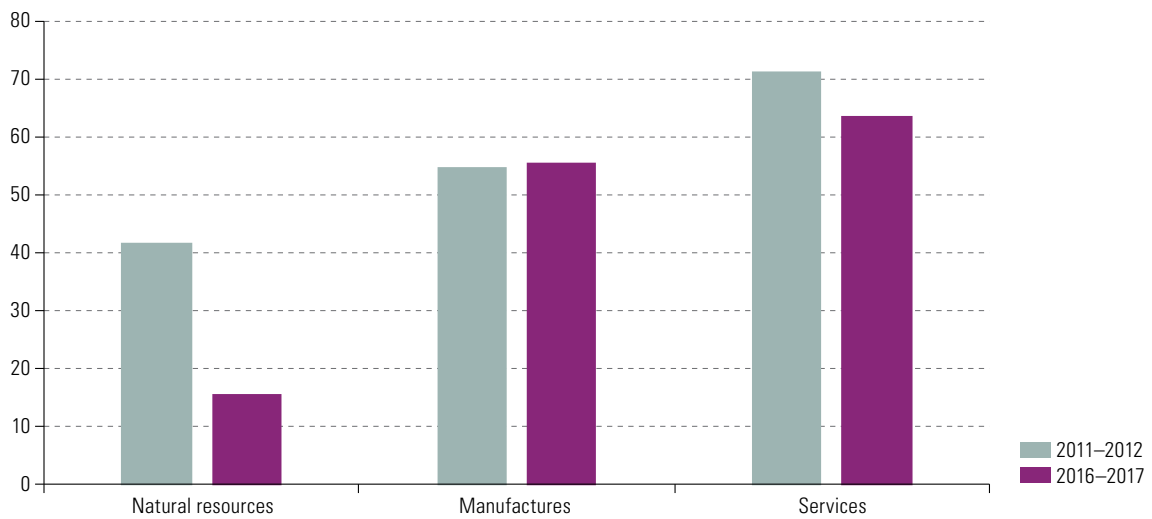
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures as of 6 June 2018.

In Central America, FDI rose for the eighth consecutive year, with a notable jump in Panama, where it reached US$ 6.066 billion. The rise in consumption generated an increase in investments in services, new projects were carried out in renewable energies and the competitiveness of export manufacturing also led to higher inflows.

In the Caribbean, FDI inflows were up by 22%, to US$ 6.074 billion. Over half this sum went to the Dominican Republic. The Caribbean countries in general have seen a considerable rise in investment in the tourism sector, and in Guyana and Jamaica investment has risen in natural resources as well.

The composition of FDI inflows has shifted over the medium term, with a decline in investment in natural resources and an increase in services and manufacturing. In the services sector, investment has grown in renewable energies and telecommunications. In manufacturing, FDI continues to rise in the automotive industry in Mexico and Brazil, reaching record figures in both countries in 2017. This shift provides opportunities to target investments in those sectors with greatest capacity to drive structural change and sustainable development in the region, a process that must be supported by policies to underpin capacity-building in host countries (see figure 2).

Figure 2
Latin America and the Caribbean: FDI inflows by sector, 2011–2012 and 2016–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures as of 6 June 2018.
Note: Annual averages. Excludes Dominica, Guyana, Haiti, Jamaica, Paraguay, Peru, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Trinidad and Tobago and Venezuela (Bolivarian Republic of), owing to data availability issues. Data were not available for 2017 for Argentina, Chile, Panama or Uruguay.

The countries of the European Union are still the largest source of FDI for Latin America and the Caribbean overall, although with a heavier presence in South America than in Mexico and Central America, where United States investments dominate. In 2017, Chinese investment in Brazil increased, reflecting the acquisition of several assets in the electric power sector, although foreign investment by Chinese firms fell significantly at the global level.

FDI outflows from the countries of the region have fallen more than inflows. In 2017 they represented just US$ 23.416 billion, less than half the 2014 figure. Trans-Latin firms, which had expanded strongly between 2006 and 2014, have not been able to diversify their strategies beyond the extractive industries or market-seeking in other countries

of the region. As a result, in a context of recession (or slow growth, depending on the country) and falling oil and mineral prices, they have had to scale back or at least slow the expansion of their operations abroad.

No change in trend is expected in 2018 with regard to FDI inflows. Even if commodity prices continue to rise, the high levels of FDI seen in the extractive industries in 2011 and 2012 are unlikely to be repeated owing, first, to the capacities already built up in the past decade and, second, to the global trends towards decarbonization of the economy and more efficient use of resources.

Global trends also point towards stability. Despite the growth of the global economy and abundant financial market liquidity, global FDI flows fell by 23% in 2017 and remain below those registered before the financial crisis of the past decade. Uncertainty over many countries' trade and investment policies and the development of digital firms, which require less investment in fixed assets to expand internationally, will keep FDI growth much more moderate in the next few years.

The region does have examples to show of sectors where national development and investment policies have helped to generate positive effects on employment, productivity or sustainability. Cases that stand out are the increasing investments in the automotive sector in Mexico and Brazil and manufacturing and services for export in Central America and the Dominican Republic. But these cases are still not enough to drive a transformation of the region's production structure. This means that FDI attraction policies need to be integrated into sustainable development plans in the region, affording particular importance to building local capacities, both for attracting FDI and for tapping its advantages.

B. Advanced manufacturing in Mexico

In the past few decades, Mexico's production structure has undergone a deep shift involving, principally, export-oriented manufacturing. Although Mexico's export orientation largely has its roots in the industrial development and employment creation programmes on the northern border —the maquila industry— this was consolidated by the country's accession to the General Agreement on Tariffs and Trade (GATT), trade and financial liberalization and the signing of the North American Free Trade Agreement (NAFTA). It was at this point that foreign trade growth and FDI inflows began to take off.

Between 2010 and 2017, the manufacturing sector —especially the automotive, electronics and aerospace industries— accounted for 54% of FDI inflows and 85% of exports. However, technological progress is rapidly and extensively changing the way things are made, the characteristics of goods and services, the boundaries of the various sectors, business models and consumer preferences, among other factors.

In 2017, the automotive industry reached historic levels of production, exports and FDI, despite the uncertainty generated by the renegotiation of NAFTA. Today, 9 of the 10 largest manufacturers in this industry and the great majority of tier-1 suppliers in the world have operations in Mexico. There are some 2,600 plants producing parts, pieces and components, almost 600 of which are tier-1. In 2017, Mexico was the world's seventh largest producer and fourth largest exporter of vehicles, as well as the sixth largest producer of car parts. However, local operations in the car parts subsector continue to be import- and labour-intensive and consist principally of simple assembling activities. This means that the supply chain is poorly integrated with the rest of the economy, which limits the participation of smaller local firms.

In Mexico, the main segments of the electronics industry are led by foreign firms. Between 1999 and 2017, the industry received some US$ 20 billion in FDI, which translated into exports of around US$ 66 billion and, after several years of deficits —due to dependence on imported inputs and components—, a surplus of US$ 2.5 billion in 2017. Mexico is the world's second largest exporter of electronic equipment (mainly television sets), the third largest exporter of computers and the fifth largest exporter of communications equipment. Although public policies and initiatives by certain firms have marked some achievements at the local level, the electronics industry still shows little progress in terms of local value added and capacity-building.

The Mexican aerospace industry has shown strong growth over the past few years, thanks to a rise in demand for travel and fleet renewal by the leading air transport companies. Although the manufacture of aeroplanes is heavily concentrated in just a few firms, strong competition between them has stimulated fragmentation and relocation. In this scenario, and taking advantage of the capacities developed by the automotive industry, Mexico has begun to position itself as an attractive location. Between 1999 and 2017, the industry received around US$ 3.2 billion in FDI and, in 2017, generated exports worth US$ 3.7 billion and a trade surplus of US$ 1.0 billion. Today there are some 300 firms, the great majority of them foreign, specialized in manufacturing parts and components for aeroplanes that are assembled in other countries. In the past five years, Mexico has positioned itself third, behind China and the United States, as a destination for FDI by the main firms in the aerospace industry.

The performance of these three sectors has been highly positive, although there has also been an increase in polarization. Today, production sectors that are highly integrated with global production chains exist alongside traditional low-productivity activities far from the technology frontier. This dynamic is underpinned by slow progress in adding value to exports and in integrating smaller local firms into production chains headed by transnational companies. A lack of continuity in public policies has also prevented more substantive progress in local capacity-building that would support technological progress and deepen production integration.

C. Export platforms in Central America and the Dominican Republic

During the 1980s, foreign firms began to set up plants in Central America and the Dominican Republic for producing labour-intensive goods for export to the United States. These export industries have evolved a great deal since then, but they continue to compete on the basis of low-cost labour and ready access to the United States market.

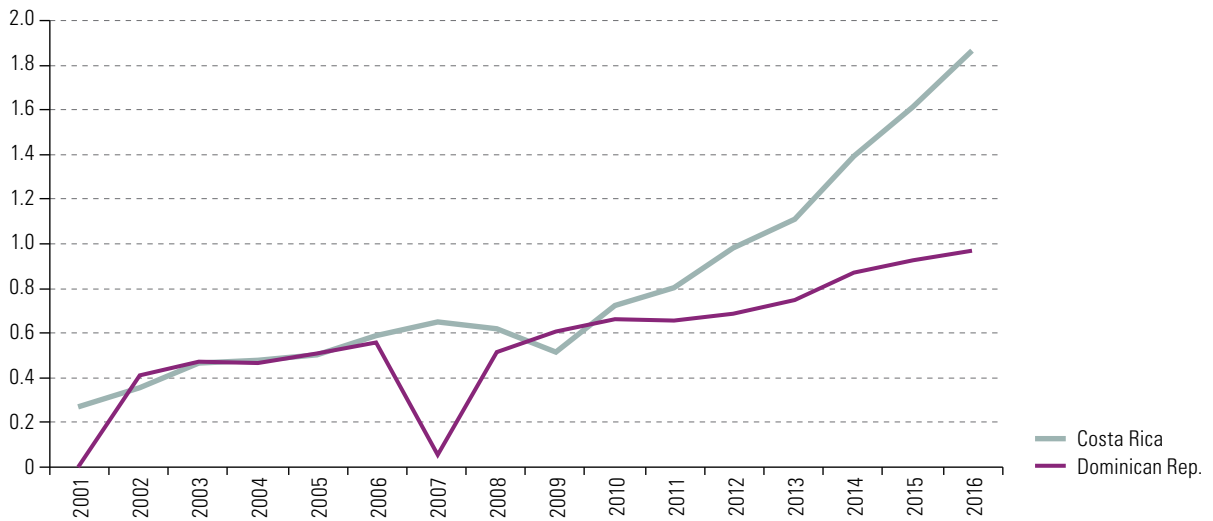
Clothing manufacturing was the first industry to develop and is now present in all the countries of the subregion except Costa Rica and Panama. The industry was badly affected by competition with Asia when the Multi-Fibre Arrangement ended in 2005, but was able to adapt by developing the value chain and responding much faster to the demands of the United States market than firms in Asia. In this regard, the public-private effort made in El Salvador with respect to the sportswear value chain, which enabled the country to offer a "full-package" service, i.e. the entire value chain from the manufacturing of thread to packaging of the final product, has been particularly successful. Other countries in the region have evolved in this direction as well.

The second industry to develop was electronics, although the value of exports fell sharply after the closure of the Intel plant in Costa Rica in 2014. It remains an important industry however, especially in Honduras and Nicaragua, where plants have been set

up in the past few years for manufacturing automotive wiring harnesses, which are integrated into the automotive industry in North America.

Although clothing and electronics exports have not expanded over the past 10 years, medical equipment made in Costa Rica and the Dominican Republic is increasingly in demand in the United States, and this is reflected in growth in the exports of these products (see figure 3). In Costa Rica, this industry has developed notably: not only has the value of exports risen, but the type of products exported has evolved as disposable devices (with lower value added) are being replaced by other, more sophisticated products.

Figure 3
Costa Rica and the Dominican Republic: exports of medical equipment, 2001–2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

Even stronger growth has been seen in services exports across all the economies in the subregion, but especially in Costa Rica, Panama and the Dominican Republic. These include call centres as well as more sophisticated business services (such as legal and accounting services) or, in the case of Costa Rica, even research and development centres.

The growth of export-oriented services and manufacturing has been based mainly on the availability of cheap labour. Although evolution towards activities with higher value added over recent years has raised the skills levels (and wages) of many workers, firms looking to set up in these countries are still motivated by lower labour costs. Accordingly, the technical progress leading to greater process automation could slow these industries' development and even eliminate the need to seek locations where labour costs are lower. Although the replacement of workers by sewing robots is still incipient, in remote business services, many firms are now using software to replace office workers. In order to meet this challenge head on, the countries of the subregion should make headway in training and support an industrial sector capable of more complex operations, as well as an innovation system to attract investment in new types of production.

Another challenge is the overconcentration of exports in the United States market, which absorbs as much as 90% of the subregion' s manufacturing exports, and has eased to some extent over the past few years only in the case of medical equipment from Costa Rica. In the event of a shift in market entry conditions in the United States, firms in these countries could find themselves at a disadvantage vis-à-vis their competitors.

D. The European Union, the main source of quality investment for Latin America and the Caribbean

Firms from the countries of the European Union represent a very important source of investment for Latin America and the Caribbean. Around 41% of all cumulative FDI assets in the main economies of the region (the FDI stock) comes from European countries, and this presence is especially important in South America. European FDI is dominated by Spain, which represented 29% of European investments in new projects in the region and 29% of mergers and acquisitions in 2005-2017. Spain is followed as an investor in new projects by Germany (16%), the United Kingdom (13%), Italy (12%) and France (11%).

Beyond the amounts invested, firms from the European Union are notable for their technological capacity in some sectors in which they have major investments in Latin America and the Caribbean. In particular, European firms operating in renewable energies, telecommunications and the automotive sector invest much more in research and development (R&D) than their counterparts in the United States or Asia. This research effort is an indicator of the potential of FDI by these firms to contribute to the development of the region's economies.

Although European FDI in the region is very diversified, since the end of the commodity price supercycle, renewable energies, telecommunications and the automotive sector are precisely the three sectors that have taken on greatest importance for European investment in Latin America.

Between 2005 and 2017, European firms were responsible for 65% of all investment in renewable energy projects in Latin America. In telecommunications, European firms accounted for 43% of the total in that period, while in the automotive sector the average was 35%, higher than for firms from the United States) (see figure 4).

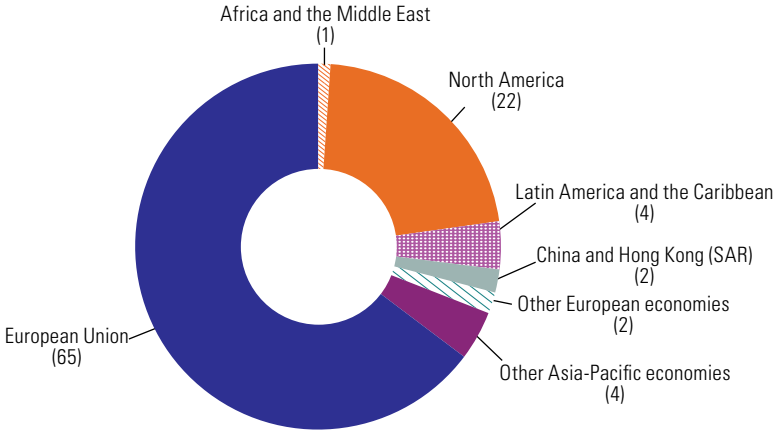
These figures help to grasp the magnitude of the presence of European transnationals in Latin America while also highlighting the opportunity that these investments represent for strengthening the production structure of the countries of the region. At the same time, Latin America offers opportunities for expansion for many European firms —facing limited growth potential in their respective home markets— as well as a means to diversify risk. Between 2010 and 2014, many European firms, particularly those from Spain, obtained the bulk of their operating profits in Latin America.

With respect to renewable energies, a sector in which the European Union has spearheaded support policies since the 1990s, the market that has opened up in Latin America this decade has represented an opportunity for numerous firms whose growth prospects were curtailed by the fiscal crisis beleaguering many European countries over this period.

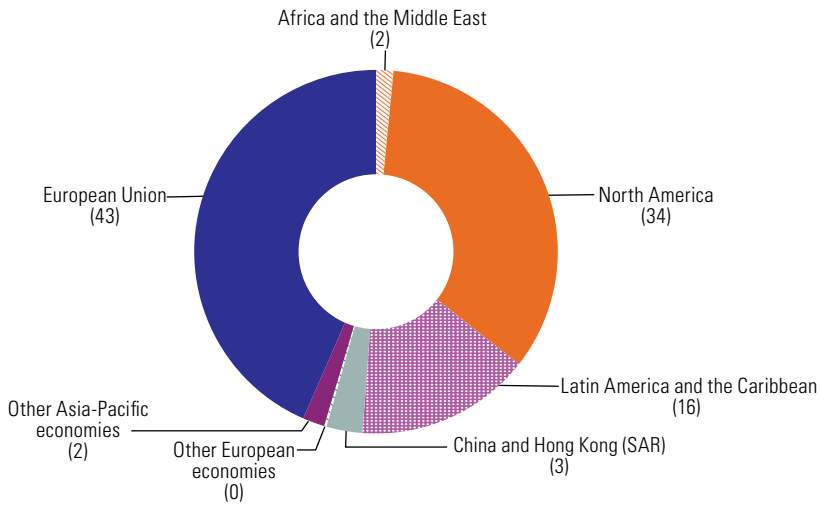
In short, relations between the European Union and Latin America and the Caribbean with regard to FDI are particularly solid and offer advantages to both parties. If the countries in the region are to take advantage of the possibilities offered by these investments, they will need to promote national policies to develop a production fabric —networks of goods and services providers— that will favour investment decisions by European transnationals while also enabling the transfer of knowledge and technology to local territories. There are experiences in this regard in several countries of the region, in particular in renewable energies and the automotive industry, but there is still a need for a comprehensive strategy in relation to FDI.

Figure 4
Latin America and the Caribbean: distribution of FDI announcements in renewable energies, telecommunications and the automotive sector, by region of origin, 2005-2017
(Percentages of total amount)

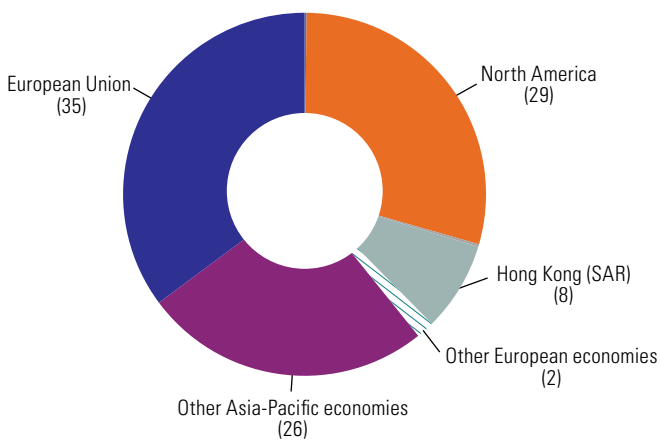
A. Renewable energies



B. Telecommunications



C. Automotive sector



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] https://www.fdimarkets.

CHAPTER I

Foreign direct investment in Latin America and the Caribbean

A. Global foreign direct investment flows have not recovered with the world economy

In 2017, certain trends that had already emerged in the global economic landscape became more established. In particular, announcements of potential restrictions on trade and pressures to relocate production to developed countries were confirmed, and while this may encourage an increase in national investments in some advanced economies, it is not conducive to transnational investment, and thus generates uncertainty for large multinational firms.

At the same time, the substantive aspects of China's strategy to advance and consolidate its standing as an economic, productive and technological powerhouse have not changed, in other words, its pursuit of technology, advanced manufacturing, energy, infrastructure and natural resources continues. However, the country's operations overseas have changed in quantitative terms, as a result of the restrictions imposed by China's authorities on investments in the real estate sector, hotels, film, entertainment and sports, and on the creation of investment funds without specific business goals. In addition, growing concern in European countries and in the United States about the acquisition of strategic technological and production assets by Chinese transnational firms has also contributed to a reduction in the transactions carried out by those firms, especially in the United States.

In addition, the upturn in commodity prices will not lead to a new boom in investment in natural resources for various reasons: overcapacity reached in the previous cycle, the long maturity period required for these types of investment and global trends promoting a more efficient use of resources and energy.

The combination of these factors goes some way to explaining the drop in global FDI in 2017, even amid stronger global economic growth (3.2%), abundant international liquidity, high corporate returns and optimism in the financial markets.

Another aspect of the global economy that could affect FDI flows relates to the significant technological changes that have taken place in recent years, in particular those related to the digital transformation of production and consumption systems. China's expansion and the interest of core developed economies in protecting investments in sectors that are considered strategic is closely linked to technological progress. The expansion of digital technologies is hastening the transformation of industries and consumption patterns, and has encouraged greater mergers and acquisitions activity as companies seek to position themselves in a rapidly and constantly changing market, where economic fundamentals are challenged by new forms of internationalization and business expansion.

On the one hand, digitization of the economy may have reduced the need to transfer capital to other countries, as digital companies can grow throughout the world without needing to hold large assets overseas. For example, Internet platforms have a foreign sales-to-foreign assets ratio of 2.6, digital solution firms one of 1.9 and software companies one of 1.4, whereas traditional transnational companies have a ratio of 1.0. Thus, the international expansion of digital firms is not directly linked to their FDI flows, unlike in more traditional sectors, such as food and beverages (1.0), hydrocarbons (0.8) or mining (0.9) (UNCTAD, 2017). As the weight of digital firms in the economy rises, the growth of FDI flows needed to gain access to overseas markets will decrease.

On the other hand, the need to acquire technological capacities is driving intersectoral mergers and acquisitions. In particular, many traditional firms are seeking specialized assets, which is increasingly blurring the boundaries between sectors (see table I.1). In the United States, intersectoral transactions have been growing in recent years and 2017 saw a 10-year peak in the value of transactions involving technology firms: US$ 144 billion, US$ 90 billion up on 2014 levels. The financial services, consumption, energy and healthcare sectors have shown the greatest interest in acquiring technological firms (KPMG International, 2018). As most large companies in the digital economy are domiciled in the United States (and, to a lesser extent, in China), the bulk of mergers and acquisitions in this emerging sector have not been cross-border transactions, which has also reduced global FDI flows.

Table I.1
United States: largest intersectoral transactions, 2017

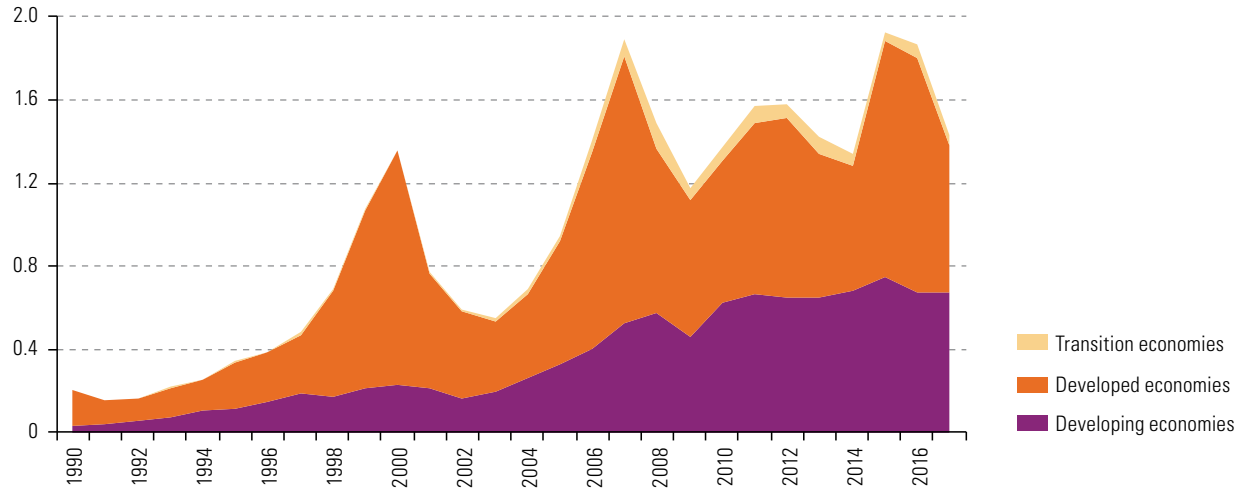
Company	Sector	Assets acquired	Sector	Value *(billions of dollars)*
CVS	Pharmacy chain	Aetna	Health insurance	69.0
Amazon	Digital market platform	Whole Foods Market	Supermarkets	13.7
Disney	Film, television	BAMTechnologies	Online media (streaming)	1.5
Office Depot	Stationery retail chain	CompuCom	Technological services and solutions	1.0
Target	Department store chain	Grand Junction, Shipt	Transport platform, delivery start-up	0.55
Emerson Electric	Engineering services	Paradigm	Software services for hydrocarbons	0.51
Delphi	Autoparts	NuTonomy	Autonomous vehicles start-up	0.45
Williams-Sonoma	Kitchen furniture and equipment	Outward	Augmented reality and 3D imaging	0.112
Ford	Automobiles	Argo AI	Artificial intelligence	Undisclosed
Jo-Ann Stores	Arts & crafts retail chain	Creativebug	Online arts & crafts classes	Undisclosed
Petco	Pet products retail chain	PetCoach	Application for pet advice	Undisclosed
Whirlpool	Domestic electrical appliances	Yummly	Personalized recipe search engine	Undisclosed

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of T. Lachapelle, "Corporate America's dealmakers are cross-pollinating", Bloomberg, 2 January 2018 [online] https://www.bloomberg.com/gadfly/articles/2018-01-02/dealmaking-trend-for-corporate-america-is-cross-pollination.

B. The FDI decline is concentrated in advanced economies and Chinese growth slows

In 2017, global FDI inflows fell by 23% to US$ 1.43 trillion as a result of a 37% drop in FDI in developed economies, which now account for 50% of the total (see figure I.1). Inflows to developing countries remained stable: FDI in Asia increased slightly, while flows to Africa, the transition economies of Eastern Europe and Latin America and the Caribbean were down on the previous year.

Figure I.1
Global direct foreign investment inflows by group of economies, 1990–2017
(Trillions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2018: Investment and New Industrial Policies*, Geneva, 2018.

Over the long terms, global FDI flows have been slowing; FDI did not match its record levels of 2007 —registered before the onset of the global financial crisis— until 2015 and 2016, and since then has fluctuated around US$ 1.5 trillion, in nominal terms. The upward trend in the two decades that preceded the financial crisis seems to have been broken, despite better conditions for FDI in recent years: positive growth rates in the world's largest economies, abundant liquidity, high valuations for financial assets and a series of technological changes leading to the restructuring of many industries.

A similar trend may be observed in goods and services trade, which increased steadily between 1991, when it accounted for 18% of global GDP, and 2008, when it accounted for 32%, with only minor setbacks in two years during that period. However, as from 2008, worldwide exports of goods and services underperformed economic growth and, despite an upturn in 2017, they remain at around 28% of GDP, four points below their level a decade ago.

Net cross-border mergers and acquisitions fell by 22% in 2017, to US$ 693.962 billion; nonetheless this figure remains the fourth largest behind those registered in 2016 and 2015, and the record US$ 1 trillion in 2007 (see figure I.2).[1] In addition, the early months in 2018 indicate a recovery in this indicator (Bureau van Dijk, 2018). Conversely, new investment announcements by companies in overseas markets seem to be declining. In 2017, announcements fell 14% and accounted for US$ 720.334 billion —the lowest value in more than a decade— despite being measured in nominal values. The global standstill in FDI seems to be attributable more to a decline in investments in new capacity than to a contraction in cross-border mergers and acquisitions which is compatible with the low growth levels in gross fixed capital formation observed globally in the past decade, and especially in developed countries (United Nations, 2018).

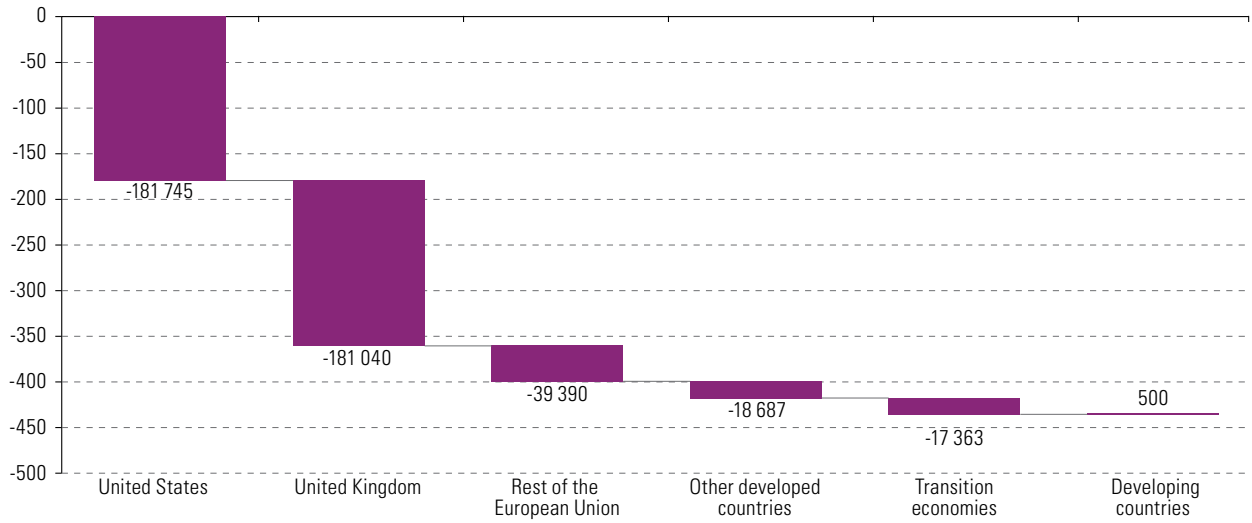
[1] Data for net cross-border mergers and acquisitions used by the United Nations Conference on Trade and Development (UNCTAD) refer to the sales value of companies in the recipient economy to foreign companies, minus the sales value of foreign subsidiaries in the recipient economy.

Figure I.2
Worldwide cross-border investment flows, by location of assets
(Billions of dollars)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2018: Investment and New Industrial Policies*, Geneva, 2018.
Note: Data for net cross-border mergers and acquisitions used by the United Nations Conference on Trade and Development (UNCTAD) refer to the sales value of companies in the recipient economy to foreign companies, minus the sales value of foreign subsidiaries in the recipient economy.

The drop in mergers and acquisitions flows in 2017 was concentrated in the United States and, especially, in the United Kingdom, which in 2016 hosted three of the four largest acquisitions in the world: the acquisition of SABMiller by Anheuser-Busch, that of British Gas by Shell, and that of semiconductors firm ARM by SoftBank. Practically the entire decline in global FDI was on account of these two countries: US$ 181.04 billion less in the United Kingdom and US$ 181.745 billion less in the United States (40% and 92% less than in 2016, respectively) (see figure I.3).

Figure I.3
Decline in FDI inflows in selected countries and regions, 2016–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2018: Investment and New Industrial Policies,* Geneva, 2018.

FDI into developing economies remained stable in 2017, although Asia was the only region where flows increased compared with the year before. Flows to Africa (US$ 41.772 billion) were 21% lower than the previous year, while in the transition economies of Eastern Europe flows fell by 27% to US$ 46.767 billion, while they also retreated marginally in Latin America and the Caribbean (see table I.2).

Table I.2
Global FDI inflows, variation and distribution by region, 2008–2017

Regional grouping	Investment flows (billions of dollars)						Variation rate (percentages)					Investment flows (percentages)					
	2008-2012[a]	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2008-2012[a]	2013	2014	2015	2016	2017
World total	**1 436**	**1 425**	**1 339**	**1 921**	**1 868**	**1 430**	**-9**	**-6**	**44**	**-3**	**-23**	**100**	**100**	**100**	**100**	**100**	**100**
Developed economies	**762**	**693**	**597**	**1 141**	**1133**	**712**	**-19**	**-14**	**91**	**-1**	**-37**	**53**	**49**	**45**	**59**	**61**	**50**
European Union	397	345	260	516	524	304	-30	-25	98	2	-42	28	24	19	27	28	21
United States	215	201	202	466	457	275	1	0	131	-2	-40	15	14	15	24	24	19
Transition economies	**78**	**84**	**57**	**36**	**64**	**47**	**29**	**-32**	**-36**	**78**	**-27**	**5**	**6**	**4**	**2**	**3**	**3**
Developing economies[b]	**597**	**649**	**685**	**744**	**670**	**671**	**0**	**6**	**9**	**-10**	**0**	**42**	**45**	**51**	**39**	**36**	**47**
Latin America and the Caribbean	166	194	203	187	168	162	-5	5	-8	-10	-4	12	14	15	10	9	11
Africa	52	51	52	57	53	42	-2	3	8	-6	-21	4	4	4	3	3	3
Developing Asian countries	386	415	460	516	475	476	2	11	12	-8	0	27	29	34	27	25	33

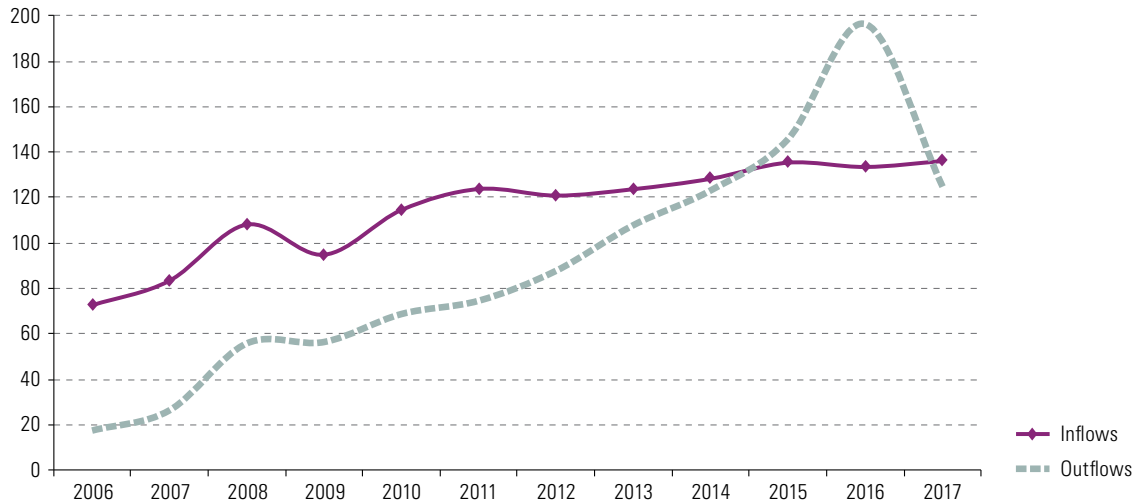
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2018: Investment and New Industrial Policies*, Geneva, 2018, and official figures and estimates for Latin America and the Caribbean.

[a] Simple average.

[b] The figure is not equal to the total for the subregions as the figures for Latin America and the Caribbean are not taken from UNCTAD.

Within Asia, China was a notable FDI recipient in 2017 with inflows of US$ 136.320 billion, making it the second largest FDI recipient in the world, behind the United States. Inward FDI in China has risen steadily over the past decade, but the increase in the country's outward FDI has been even more spectacular, rising in the same period from US$ 27 billion to US$ 124.63 billion (see figure I 4). Although it is still far from being the main investor in foreign markets, in recent years China has emerged as the third largest investor in the world, behind the United States and Japan.

Figure I.4
China: FDI inflows and outflows, 2006–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2018: Investment and New Industrial Policies*, Geneva, 2018.

In 2017, China's outward FDI fell by 36%, after its government adjusted its control mechanisms to better align FDI flows with the country's strategic priorities, formalized under the "One Belt, One Road" programme for infrastructure construction overseas, and the industrial development strategy, *Made in China 2025*. The Government of China has stated its intention to restrict investments in real estate or in investment funds without a specific goal, and to support those framed within its One Belt, One Road strategy: high technology, advanced manufacturing and research and development (R&D); hydrocarbons, mining and natural resources; agriculture, forestry and fisheries; and logistical and financial services. This is simply a confirmation of the government's long-term strategy regarding inward and outward FDI, which consists of endorsing and encouraging only those activities consistent with its strategic development goals (Enright, 2018).

This policy adjustment was adopted after the strong expansion in Chinese overseas investments in 2016, which totalled US$ 196.149 billion, surpassing inflows for the first time. This substantial increase in Chinese investments once again fed the suspicions of many governments, especially in developed countries, which renewed their control mechanisms in order to veto certain acquisitions (see box I.1).

Box I.1
Protection of strategic assets in advanced economies

In recent years, developed countries have responded to growth in mergers and acquisitions by transnational companies from emerging economies, especially China, introducing legal mechanisms aimed at protecting their strategic assets.

In 1975, the United States established the Committee on Foreign Investment in the United States (CFIUS) —which allows the government to review proposed mergers and acquisitions transactions which could threaten national security— in order to examine the investments by member countries of the Organization of Petroleum Exporting Countries (OPEC), on the grounds that these obeyed political and not economic reasons. In recent years, the Committee has gained renewed importance owing to the growing number of Chinese acquisitions.

In the event of the acquisition of a given asset a foreign company, CFIUS identifies potential risks to national security and proposes mitigation measures. If it finds that risks cannot be mitigated, it recommends that the President block the transaction, which can be done if two conditions are met: (i) other laws of the United States are inadequate or insufficient to protect national security, (ii) the President has "credible evidence" that the foreign investment would adversely affect national security.

In the years since the Commission's establishment, five transactions have been blocked by order of the President. Three of these were blocked, between 2016 and 2018, in the semiconductors segment: the sale of German firm AIXTRON by China's Fujian Grand Chip Investment Fund, for US$ 750 million, to prevent the sale of its United States subsidiaries; that of Lattice Semiconductor Corp. by the Chinese fund Canyon Bridge Capital Partners for US$ 1.3 billion; and that of Qualcomm by Singapore firm Broadcom, for US$ 117.0 billion. Half of reported cases were in the manufacturing sector, 23% were in electronics and 19% involved China (13% Canada, 10% Japan, 30% EU) (CFIUS, 2015).

In recent years, other developed countries have mirrored these initiatives. Canada and Australia launched similar mechanisms between 2007 and 2008, although these apply only when the acquiring company is State-owned (which is common in China) (Sauvant and Nolan, 2015). The European Union has been the most recent to adopt the strategy. In September 2017, the European Commission proposed a legal framework to control FDI from a security and public order perspective, which was adopted by the European Parliament's Committee on International Trade (INTA) in May 2018, and which will be put to the vote at the next plenary session in mid-June 2018.

The proposed regulation provides that in order to review a transaction on the grounds of national security or public order, the proposed foreign investment must have an impact on critical infrastructure (energy, transport, communications, data storage, space or financial infrastructure, as well as sensitive facilities), critical technologies (including artificial intelligence, robotics, semiconductors, technologies with potentially dual applications, cybersecurity, and space or nuclear security), security in the provision of critical inputs, or access to confidential information, or the capacity to control confidential information. Similarly, authorities may also consider whether the investor is controlled by the government of a third country, including through substantial funding (European Commission, 2017).

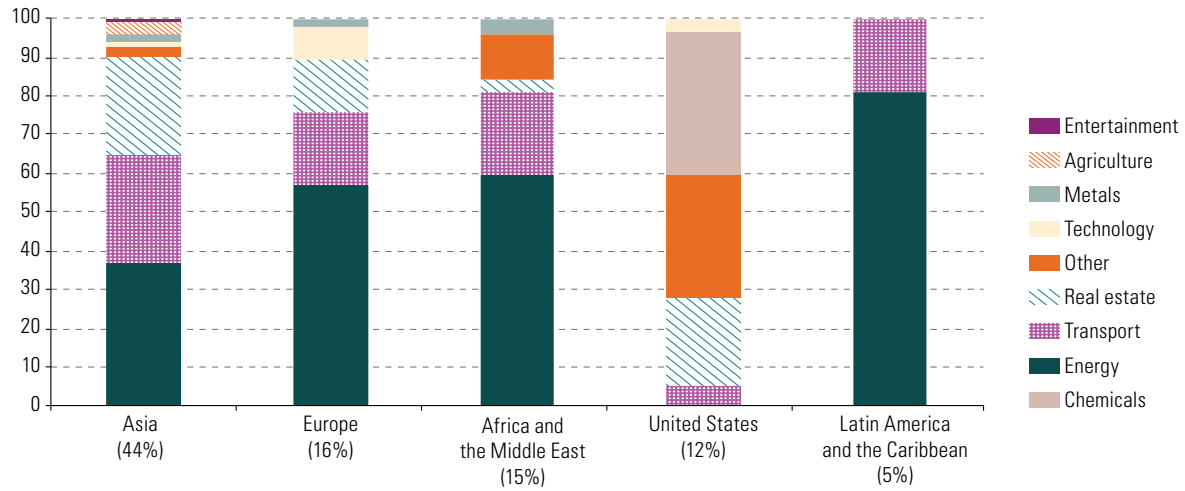
Furthermore, the eurodeputies in INTA increased the scope of the proposal to allow the Commission and the member States of the European Union to verify if the foreign investment could affect the independence of mass media or the strategic autonomy of the Union, as well whether if the investor had in the past invested in types of projects that could threaten security or public order, and whether the foreign investment could lead to a monopoly (European Parliament, 2018).

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Committee on Foreign Investment in the United States (CFIUS), Annual Report to Congress, 2015 [online] https://www.treasury.gov/resource-center/international/foreign-investment/Documents/Unclassified%20CFIUS%20Annual%20Report%20-%20(report%20period%20CY%202015).pdf; European Parliament, "Foreign investment to be screened to protect EU countries' strategic interests", 28 May 2018 [online] http://www.europarl.europa.eu/news/es/press-room/20180528IPR04446/foreign-investment-to-be-screened-to-protect-eu-countries-strategic-interests; and European Commission, "Proposal for a Regulation of the European Parliament and of the Council establishing a framework for screening of foreign direct investments into the European Union", 13 September 2017 [online] http://www.europarl.europa.eu/RegData/docs_autres_institutions/commission_europeenne/com/2017/0487/COM_COM(2017)0487_EN.pdf; K. P. Sauvant and M. D. Nolan, "China's outward foreign direct investment and international investment law", *Journal of International Economic Law*, vol. 18, No. 4, 2015.

China's internationalization in its most recent expansion period, has taken place via mergers and acquisitions more than greenfield investments. In accordance with this rationale, Chinese transnational corporations have shown a greater interest in acquiring capacities, technologies and access to markets in advanced economies through the acquisition of strategic assets capable of delivering results in the short term. As regards greenfield investments, which tend to materialize in the medium to long term, China's growth has been less spectacular.

Another feature of the country's internationalization strategy relates to the geographical location of investments, with China's greenfield investments mostly concentrated in Asia. By sector, investments are mainly focused on energy, followed by transport, with the exception of the United States, where China's approach is different to its investment strategy for other countries and regions (see figure I.5).

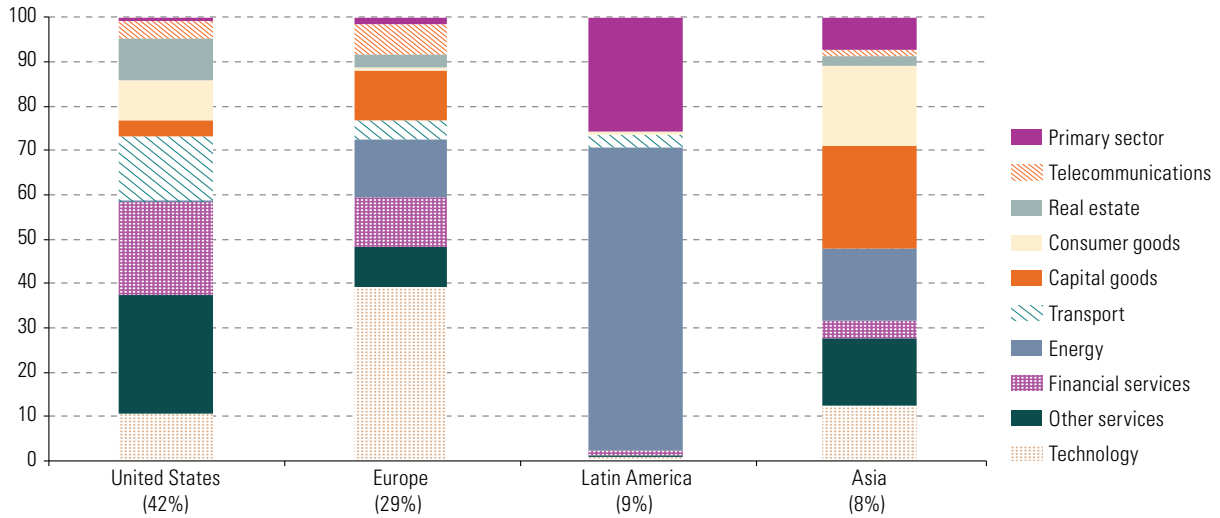
Figure I.5
China: FDI announcements by target region or country, 2016–2017
(Percentages of the total)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of American Enterprise Institute y Heritage Foundation, "China Global Investment Tracker" [online] http://www.aei.org/china-global-investment-tracker/.

Cross-border mergers and acquisitions, which have accounted for the bulk of Chinese FDI in the last two years, were concentrated in the advanced economies and showed greater sectoral diversification. Unlike greenfield projects, where investments have been mainly concentrated in Asia, acquisition targets for Chinese transnational corporations have been mostly located in the United States, which accounted for 42% of total transaction volumes between 2016 and 2017, followed by Europe (29%). The share of other regions in this period was less than 10%; Latin America and the Caribbean accounted for 9% as a result of large acquisitions mostly in Brazil (see section C.4). Chinese activity in Europe focused mostly on the acquisition of technology firms, which has led European countries to exert greater control of inward FDI (see box I.1). In the United States, Chinese acquisition have been more diversified, although technology and capital goods have been the main target sectors. By contrast, in Latin America and the Caribbean Chinese activity has focused on energy companies (see figure I.6).

Figure I.6
China: cross-border mergers and acquisitions by target region or country, 2016–2017
(Percentages of the total)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

C. FDI in the region continued trending downwards, with certain exceptions

1. FDI fell by 3.6% in Latin America and the Caribbean in 2017

In 2017, FDI flows into the region stood at US$ 161.911 billion, 3.6% down on 2016.[2] This represented a drop for the third year running —albeit at a slower pace than in previous years— and FDI has now recorded a cumulative 20% decline since its peak levels in 2011.

The main two reasons for the decline have been lower export commodity prices —which have led to a substantial drop in investments in the extractive industries (see section B.3)— and the economic recession in 2015 and 2016, mainly in Brazil, albeit also in other South American economies. These two trends, however, were partially reversed in 2017, as commodity prices recovered and the region returned to growth (1.3%).

The fall in FDI in 2017 was mainly attributable to Brazil (US$ 7.563 billion less than in 2016) and Chile (US$ 5.955 billion less), and to a lesser extent to Mexico. Resumption of economic growth in Brazil in 2017 was not enough to offset the impact of the 2015 and 2016 recession on FDI inflows. Argentina received US$ 11.517 billion, a similar figure to its average inward FDI in the past decade, but more than three times the investment it received in 2016. Most of the economies in Central America and the Caribbean also received greater FDI inflows than in 2016 (see table I.3 and section F).

[2] The calculation of variations excludes countries that did not have annual data available for 2017.

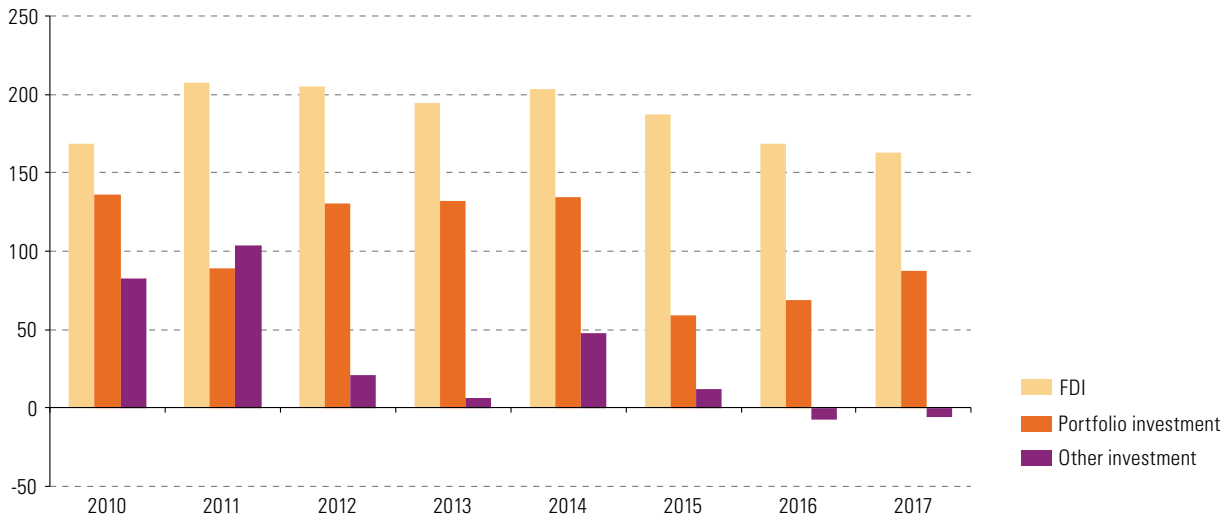
Table I.3
Latin America and the Caribbean: FDI inflows, by recipient country and subregion, 2005–2017
(Millions of dollars and percentages)

Country	2005-2009[a]	2011	2012	2013	2014	2015	2016	2017	Absolute variation 2017–2016	Relative variation 2017–2016 *(percentages)*
South America	**68 302**	**168 464**	**173 392**	**132 499**	**152 580**	**133 524**	**115 627**	**111 028**	**-4 599**	**-4.0**
Argentina	6 204	10 840	15 324	9 822	5 065	11 759	3 260	11 517	8 257	253.3
Bolivia (Plurinational State of)	259	859	1 060	1 750	657	555	335	725	389	116.1
Brazil	32 331	101 158	86 607	69 686	97 180	74 718	78 248	70 685	-7 563	-9.7
Chile	12 170	24 150	30 293	20 825	23 736	21 051	12 374	6 419	-5 955	-48.1
Colombia	8 894	14 647	15 039	16 209	16 167	11 723	13 850	13 924	74	0.5
Ecuador	465	644	567	727	772	1 322	755	606	-149	-19.7
Paraguay	137	581	697	245	412	306	320	356	35	11.1
Peru	4 978	7 341	11 788	9 800	4 441	8 272	6 863	6 769	-93	-1.4
Uruguay	1 461	2 504	6 044	755	3 830	2 435	-379	27	406	107.1
Venezuela (Bolivarian Republic of)[b]	1 403	5 740	5 973	2 680	320	1 383	...	...		
Mexico	**26 279**	**24 320**	**17 570**	**47 229**	**30 287**	**36 519**	**34 776**	**31 726**	**-3 050**	**-8.8**
Central America	**5 815**	**9 061**	**9 213**	**10 498**	**11 697**	**11 784**	**12 523**	**13 083**	**561**	**4.5**
Costa Rica	1 584	2 733	2 696	3 205	3 242	2 956	2 958	2 997	40	1.3
El Salvador	662	218	466	179	306	396	348	792	444	127.6
Guatemala	640	1 026	1 245	1 295	1 389	1 221	1 185	1 147	-38	-3.2
Honduras	742	1 014	1 059	1 060	1 417	1 204	1 139	1 186	46	4.1
Nicaragua	394	936	768	816	884	950	899	897	-2	-0.3
Panama	1 792	3 132	2 980	3 943	4 459	5 058	5 995	6 066	71	1.2
The Caribbean[c]	**6 598**	**5 380**	**4 579**	**3 885**	**8 478**	**4 917**	**5 501**	**6 074**	**1 086**	**21.8**
Antigua and Barbuda	237	68	138	101	155	154	146	...	...	...
Bahamas	1 265	1 409	1 034	1 133	3 244	408	943	928	-15	-1.6
Barbados	416	458	548	56	559	69	230	286	57	24.6
Belize	131	95	189	95	153	65	33	26	-7	-21.1
Dominica	45	35	59	25	35	36	33	...	...	...
Grenada	117	45	34	114	38	61	63	...	...	...
Guyana	135	247	294	214	255	122	58	212	154	265.8
Haiti	69	119	156	161	99	106	105	375	270	257.3
Jamaica	882	218	413	545	582	925	928	888	-40	-4.3
Dominican Republic	1 782	2 277	3 142	1 991	2 209	2 205	2 407	3 570	1 163	48.3
Saint Kitts and Nevis	136	112	110	139	120	78	69	...	...	...
Saint Vincent and the Grenadines	108	86	115	160	110	121	104	...	...	...
Saint Lucia	183	100	78	95	93	95	97	...	...	...
Suriname	-141	70	174	188	164	279	309	163	-146	-47.2
Trinidad and Tobago	1 232	41	-1 904	-1 130	661	194	-24	-374	-350	-1 475.5
Total[c]	**106 993**	**207 225**	**204 754**	**194 111**	**203 043**	**186 743**	**168 426**	**161 911**	**-6 002**	**-3.6**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of preliminary figures and official estimates at 6 June 2018.
Note: Information based on the sixth edition of the *Balance of Payments and International Investment Position Manual* (BPM6) (IMF), except for Argentina, the Bahamas, Barbados, Belize, Ecuador, El Salvador, Guyana, Haiti, Honduras, Nicaragua, Panama, Paraguay, Peru, the Plurinational State of Bolivia and Suriname.
[a] Simple averages. Due to methodological changes, data prior to 2010 are not directly comparable with data from 2010 onwards.
[b] Data for 2015 refer to the first three quarters.
[c] Calculation of changes in total FDI and total FDI for the Caribbean excludes countries for which annual data are not available.

FDI is always the most stable component of capital flows, and this is also evident in cross-border capital inflows in the region in recent years (see figure I.7). Portfolio investment, which more than halved as a result of widespread capital outflows from emerging markets in 2015, has resumed growth: in 2017 it stood at US$ 87.638 billion, with almost half of flows going to Argentina.

Figure I.7
Latin America and the Caribbean: cross-border capital inflows, 2010–2017
(Billions of dollars)



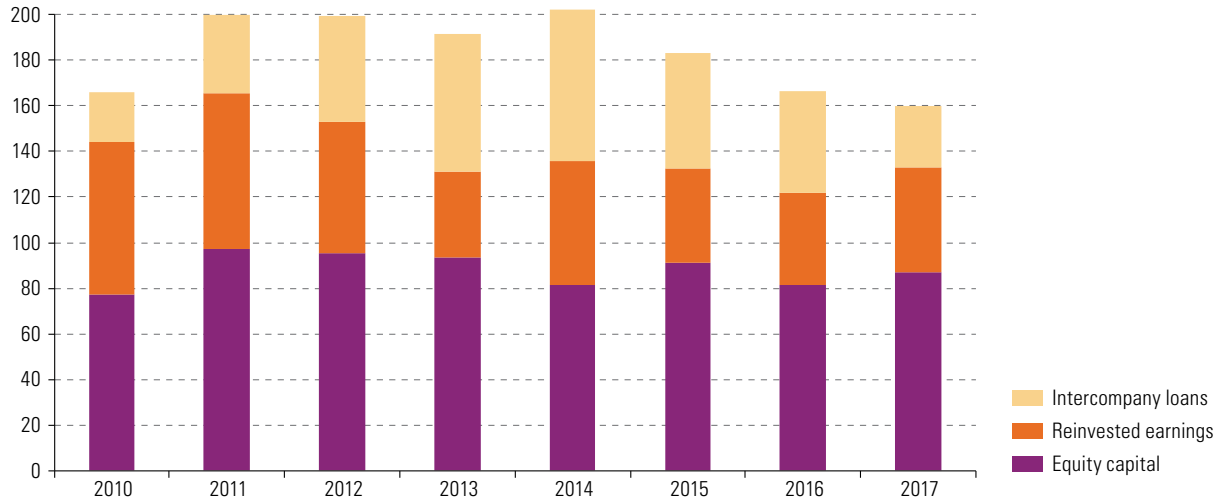
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of preliminary figures and official estimates at 6 June 2018.

Other types of investments (mainly bank loans) also declined sharply in 2015, and have not recovered in the last two years, in fact they have slipped into negative territory by a small margin, with significant variations across countries: negative flows in Brazil, Colombia, the Dominican Republic, Mexico, Panama and Peru offset positive inflows in Argentina and Chile, to mention only the larger economies. Part of the explanation for medium-term trend in capital flows to the region also lies in the fact that the Bolivarian Republic of Venezuela has not reported figures since mid-2015. This country used to be a large recipient of investments, especially in the "other investment" category (with average annual receipts of US$ 6.532 billion between 2010 and 2015), and FDI (average annual receipts of US$ 2.945 in the same period).

FDI flows are divided into three components: capital, reinvested earnings and intercompany loans, which are loans between the subsidiaries and parent of a same company that are routinely used by transnational companies for allocating capital. Intercompany loans were the main reason for the decline in FDI recorded in 2017 (see figure I.8), while capital inflows rose a modest 7% and reinvested earnings increased by 13%, driven by the recovery of returns after years of decline (see subsection below).

Brazil saw a heavy slump in intercompany loans, from US$ 24.146 billion in 2016 to US$ 11.547 billion in 2017. The decline was heavily influenced by loan repayments that Brazilian companies received from their subsidiaries overseas, which in 2017 increased by almost US$ 10 billion owing to interest rates falling in Brazil and rising in the United States. In the new methodology, these flows are recorded as inward FDI to Brazil, unlike in the previous methodology, hence the discrepancy between the two when accounting for FDI to the region in 2017 (see box I.2).

Figure I.8
Latin America and the Caribbean: FDI inflows, by component, 2010–2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of preliminary figures and official estimates at 6 June 2018.
Note: Excludes Bolivarian Republic of Venezuela, Suriname, Trinidad and Tobago and the countries of the Organisation of Eastern Caribbean States (OECS) owing to lack of data.

Box I.2
Lower foreign investment figures in 2017 are attributable to changes in accounting methodology

Since 2015, most countries in the region have been reporting foreign direct investment (FDI) data on the basis of the sixth edition of the *Balance of Payments and International Investment Position Manual* (BPM6) of the International Monetary Fund (IMF), and the fourth edition of the *Benchmark Definition on Foreign Direct Investment* of the Organization for Economic Cooperation and Development (OECD). The main change in methodology consists in the shift from the directional principle to the asset/liability principle.

The directional principle reflects the direction of influence of the investor underlying the direct investment relationship. That is, all capital flows executed by companies whose end owner is a foreign firm are recorded as liabilities in the reporting economy (inward FDI); by contrast, in the asset/liability principle, transactions are allocated to the country of origin, regardless of the country of residence of the end investor.

In practice, the main difference between the two is the way in which loans from subsidiaries to their parent companies are treated. n the case of a company's subsidiaries overseas, the directional principle records these transactions as outward FDI (as the company is resident in its home country), whereas the asset/liability principle treats them as inward FDI (as the country is increasing its liabilities).

For this reason, in the past year FDI flows into Latin America have risen or fallen depending on the accounting principle used. The following table shows FDI inflows in the two largest economies in the region over the past three years, as well as the variation between 2016 and 2017, which is negative for both countries under the new asset/liability principle and positive under the directional principle. The year before, in turn, the new methodology showed an increase for both countries, while the former methodology showed a reduction.

Box I.2 (concluded)

Brazil and Mexico: FDI inflows under the directional principle and the asset/liability principle, 2015-2017
(Billions of dollars and percentages)

	2015	2016	2017	Variation 2016-2017 *(percentages)*
Brazil				
Directional principle	64 267	58 680	62 713	6.9
Asset/liability principle	74 718	78 248	70 685	-9.7
México				
Directional principle	34 934	29 785	30 347	1.9
Asset/liability principle	36 519	34 776	31 726	-8.8

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official sources.

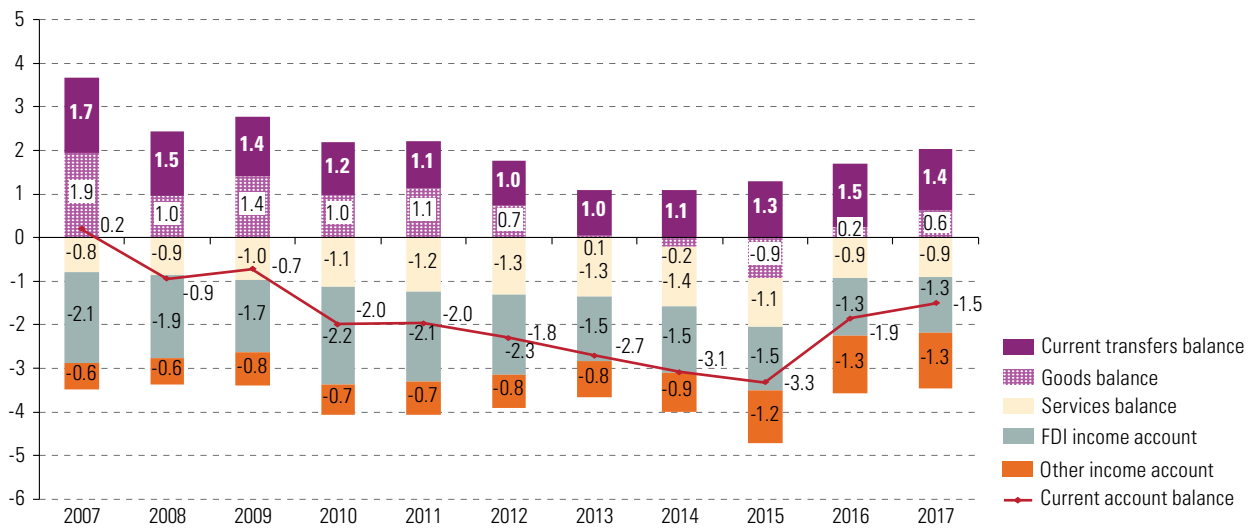
While the new methodology is more appropriate to examine balance-of-payment flows from a macroeconomic viewpoint, the directional principle offers a better representation of the relationships of influence associated with FDI. This report contains data according to the asset/liability principle, as presented by the largest countries in the region, except where indicated.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Organization for Economic Cooperation and Development (OECD), fourth edition of the *OECD Benchmark Definition of Foreign Direct Investment*, Paris, 2011; and United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2017: Investment and the Digital Economy*, Geneva, 2017.

2. Returns ceased to decline for the first time in five years

A key component of the current account in the balance of payments are the debits on account of FDI income. In the past decade the current account balance has been negative, with a growing deficit, but this has changed in the past two years: in 2017 the current account deficit stood at -1.5% of GDP (see figure I.9).

Figure I.9
Latin America and the Caribbean: balance-of-payments current account, by component, 2007–2017
(Percentages of GDP)

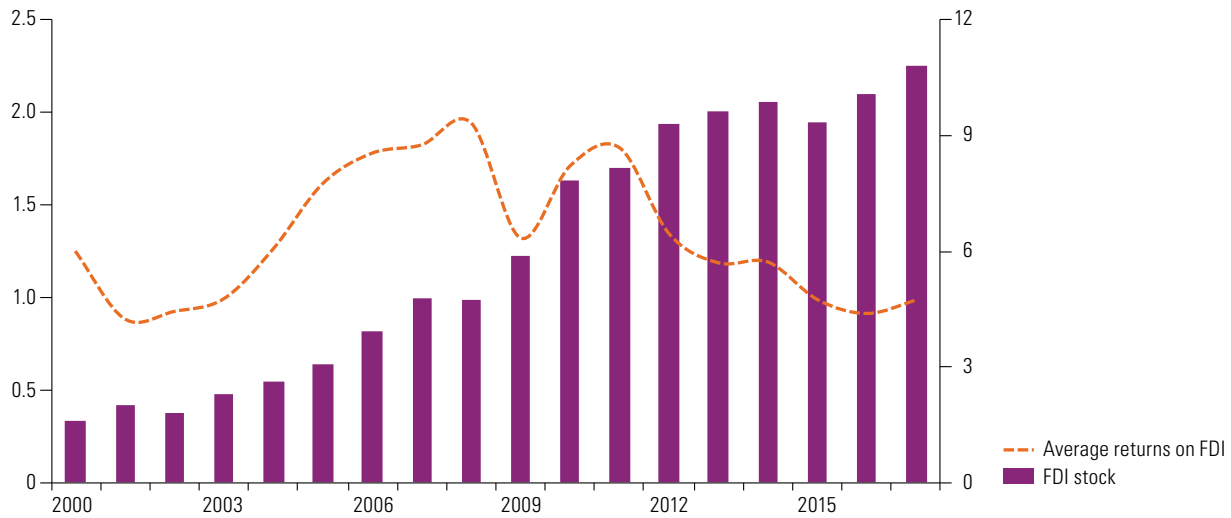


Source: Economic Commission for Latin America and the Caribbean (ECLAC), Preliminary Overview of the Economies of Latin America and the Caribbean, 2017 (LC/PUB.2017/28-P), Santiago, 2018, and official data as of 6 June 2018.

In the past year, the narrowing of the current account deficit has chiefly reflected the increase in the value of exports, which has increased the goods balance surplus, while the impact of the income balance deficit has remained more or less constant at around 2.6% of GDP. In this context, the income balance has been the main driver of the deficit; and within this component, the deficit on the FDI income balance —where repatriated earnings by transnational companies in the region are registered— stood at 1.3% of GDP. After falling compared to previous years as a result of the drop in average returns, the negative impact of the FDI income deficit on the current account has remained stable.

The stock of FDI in the region —which generates the income that negatively affects the income balance— was estimated at US$ 2.3 trillion in 2017 (see figure I.10); countries with the highest levels of FDI stock were Brazil (37% of the total), Mexico (26%), Chile (13%), Colombia (8%), Peru (5%) and Argentina (4%). In 2017, FDI income grew for the first time in five years, leading to a slight increase in the average FDI returns, which reached 4.7% (up from 4.4% in 2016).[3] This performance reflected the upturn in commodity prices and significant investment by transnational companies in natural resources.

Figure I.10
Latin America and the Caribbean:[a] FDI stock and average returns, 2000–2017
(Trillions of dollars and percentages)

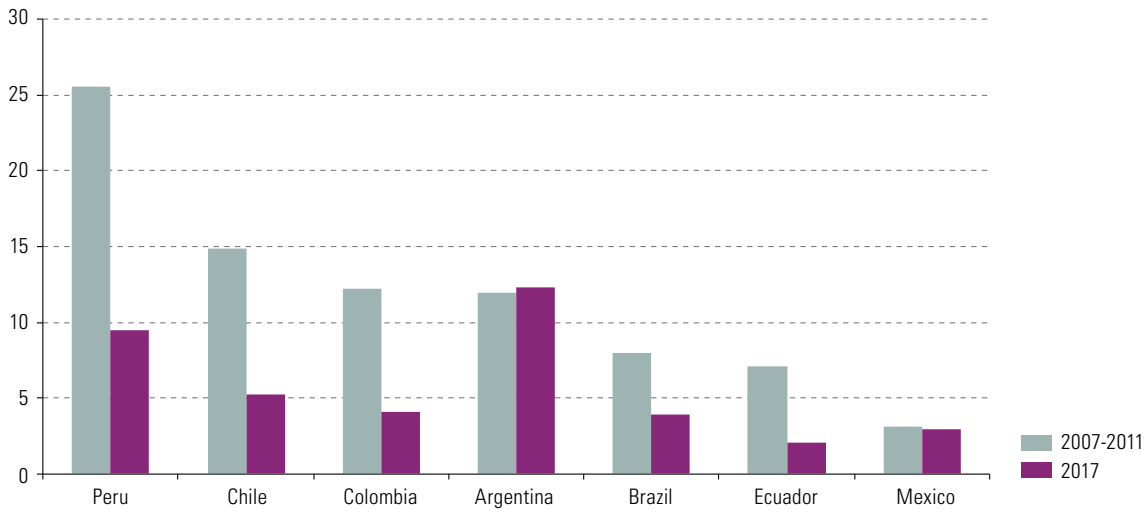


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.
Note: Average returns are calculated as the ratio between FDI income (debits) and FDI stock.
[a] Excludes the Bolivarian Republic of Venezuela, Suriname, Trinidad and Tobago and the countries of the Organisation of Eastern Caribbean States (OECS), due to lack of data.

Despite this slight upturn, current FDI returns are far from the levels reached during the natural resources price boom, as confirmed by the decline in average FDI returns in Colombia, Chile and Peru, where mining and hydrocarbon activities attracted large inward investments between 2007 and 2011 (see figure I.11).

[3] Returns calculated as the ratio of FDI income (debits) to capital stock, based on balance-of-payment data.

Figure I.11
Latin America and the Caribbean (selected countries): average returns on FDI, 2007–2011 and 2017
(Percentages)



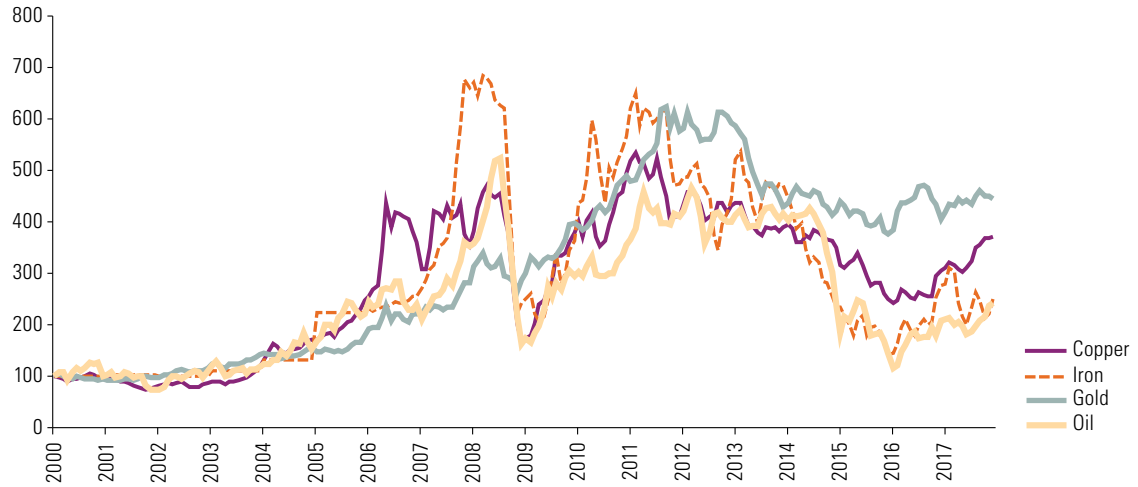
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.
Note: Average returns are calculated as the ratio between FDI income (debits) and FDI stock.

3. FDI declined in the extractive industries, but steadied in manufacturing

The decline in FDI inflow in Latin America from the 2011 peak may be attributed chiefly to the commodity price supercycle, which also peaked that year (see figure I.12). The steady rise of FDI inflows to the region —which went from US$ 46.508 billion in 2003 to US$ 203.225 billion in 2011— was closely linked to the commodity cycle, not only because of the large investments in mining and hydrocarbons, but also because of the impact of the extractive sector on the rest of the economy, and especially on domestic demand.

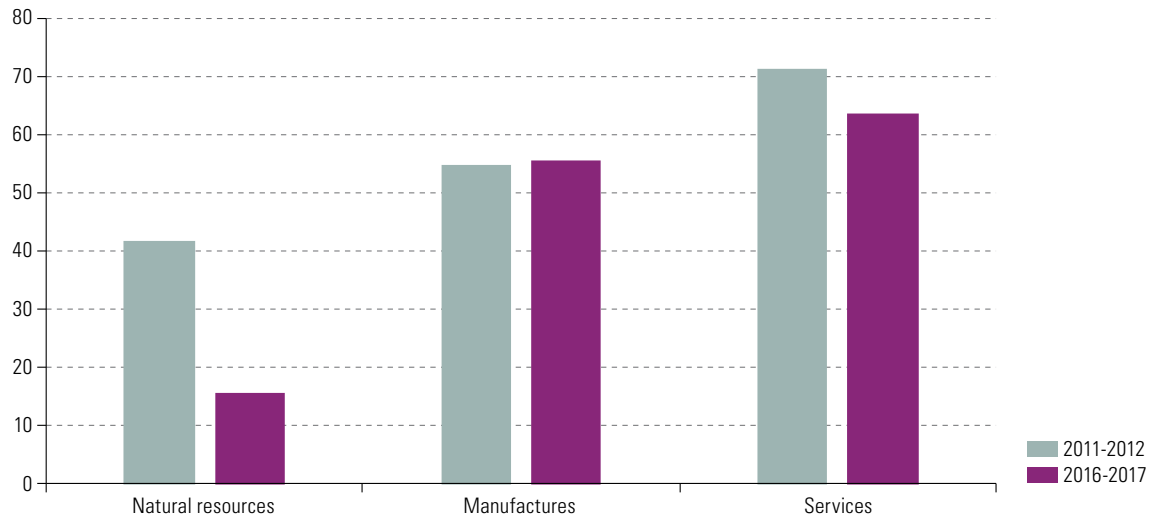
When the cycle changed and commodity prices began to fall, the pace of investment did not come to halt immediately, on account of the lagged effect resulting from the long maturity periods associated with these types of projects and the high costs assumed by companies in mining and oil extraction. As from 2013, the extractive industries began receiving lower levels of FDI, especially in Chile, Colombia, the Dominican Republic, the Plurinational State of Bolivia and Trinidad and Tobago. In the past, the Bolivarian Republic of Venezuela and Peru had also received large investments in oil and mining, respectively, and both countries have recorded declines in inward FDI, although there is no official information on FDI in the primary sector. In countries that present FDI data broken down by sector, 90% of the decline in total inflows between 2011–2012 and 2016–2017 was concentrated in the primary sector (see figure I.13).

Figure I.12
Main metals and oil prices
(Indices: January 2000=100)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data provided by the World Bank.

Figure I.13
Latin America and the Caribbean: FDI inflows by sector, annual averages, 2011–2012 and 2016–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.
Note: Annual averages. Excludes the Bolivarian Republic of Venezuela, Dominica, Guyana, Haiti, Jamaica, Paraguay, Peru, Saint Kitts and Nevis, Saint Vincent and the Grenadines and Trinidad and Tobago, owing to lack of data. No data available for 2017 for Argentina, Chile, Panama or Uruguay.

Although agricultural commodities (such as soybean, cereals and sugar) also enjoyed a cycle of high prices and in spite of the importance of the agricultural sector for some of the region's countries, FDI levels in this sector are much lower than inflows to the mining or oil sectors, and therefore price movements in these products tend to have a small impact on FDI inflows (ECLAC, 2013).

Metals and oil prices recovered significantly in 2017, but not enough to reignite investment growth. Greater investor interest in mining and oil in 2017 was evident only in Colombia, and to a certain extent in some Caribbean countries. Because investments did not come to a halt immediately with the fall in commodity prices in 2012, the capacity built up in this sector means that some time must elapse before companies once again need to add capacity to mine metals and hydrocarbons.

Aside from these conjunctural factors, it is important to consider how future investments in mining and hydrocarbons will be shaped by the structural changes in the global economy, especially in view of efforts to decarbonize growth and make more efficient use of resources, as proposed in the Sustainable Development Goals. To achieve the goal of limiting the rise in global temperature to 2 °C will require forgoing the extraction of reserves already identified, which means gradually reducing the pace of investments in oil extraction activities. Similarly, more intensive use of recycled materials, combined with the decline in Chinese steel demand, could have a major impact on future demand for iron ore. Although thus far mining and oil companies have ignored the possibility of placing specific limits on their growth,[4] governments would do well not to expect sustained medium- to long-term growth in the extraction of oil, coal and certain minerals.

Technological changes and environmental concerns reduce the demand for certain natural products, but increase that of others, such as lithium or cobalt (*Financial Times*, 2018b). This could generate a new map of extractive industries in the region, as well as attract new investors (such as Tesla or other battery manufacturers). Lithium is one of the main inputs in the production of batteries, and in 2017 it was estimated that batteries accounted for 46% of the mineral's global end-use markets (United States Geological Survey, 2018).

Latin America and the Caribbean enjoys a key position in lithium production. The "lithium triangle", as it is known, formed by Argentina, Chile and the Plurinational State of Bolivia, accounts for half of global identified resources of lithium: 18% in Argentina, 17% in the Plurinational State of Bolivia and 16% in Chile (United States Geological Survey, 2018). Chile also owns 52% of global lithium reserves —identified resources that are technically and commercially exploitable— and Argentina 14%. Lithium prices have been on a marked upward trend in the last two years, growing by 16% in 2016 and 60% in 2017. This scenario has boosted the interest of transnational firms in the production of lithium in the region: Canadian firms have launched projects in Argentina, while in Chile the Chinese firm, Tianqi Lithium —a global leader in lithium production— acquired a 24% stake in Sociedad Química y Minera de Chile (SQM) in 2018 for US$ 4 billion (close to one third of SQM revenues come from lithium exports).

Despite expectations that the development of electrical vehicles would push up lithium prices upwards, it is hard to envisage production levels in the region reaching the level of investment seen in other metals, such as copper. On the one hand, many of the projects in Argentina require investments in the hundreds of millions —not billions, as is the case of other minerals. On the other hand, lithium

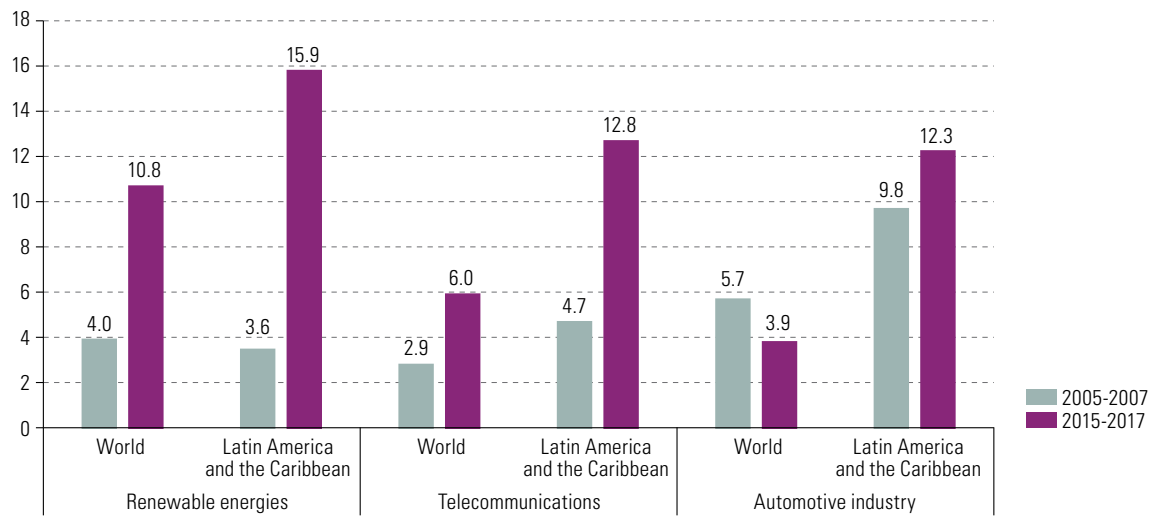
[4] BP, an oil company, recently estimated that the global demand for oil would peak by the late 2030s, before falling (*Financial Times,* 2018a).

has yet to become a scarce metal. According to estimates by the Chilean Copper Commission (COCHILCO), as from 2018 the market will see a surplus of lithium (COCHILCO, 2017). The Plurinational State of Bolivia affords strategic importance to lithium production; in 2018, it awarded German firm ACI Systems a tender for the industrialization of lithium, in a process that also included bids from Canada, China and Russia (Ministry of Energy and Hydrocarbons, 2018).

Aside from the extractive industries, other sectors have also cut their investments in the region in recent years. The recession in 2015 and 2016 had a clear impact on consumption, affecting investments in services and manufacturing for the domestic market, especially in Brazil. However, as seen in figure I.11, FDI flows to manufacturing have grown and the drop recorded in services —which continue being the main recipient— has been modest.

Some sectors in the region have seen a rise both in absolute FDI flows and in the relative preferences of investors (measured by companies' investment announcements). By this measure, Latin America and the Caribbean has attracted increasing investments in renewable energy generation, telecommunications and automobile industry firms. As shown in figure I.14, these sectors have a greater relative share in the region's economies than in the rest of the world. Chapter IV looks into these industries in greater detail, specifically in the context of European investments.

Figure I.14
Latin America and the Caribbean and the world: share in total FDI announcements, by sector
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of *Financial Times,* fDi Markets.

Whereas there has been sizeable foreign investment in telecommunications across the region, investment in the automotive industry has been concentrated in Mexico (US$ 6.972 billion in 2017) and Brazil (US$ 6.394 billion), both record figures for that industry. Investment in renewable energies has largely been concentrated in Chile and Mexico (two thirds of the total) and to a lesser extent in Brazil, whose share has fallen in recent years (see figure I.15). Importantly, most of the amounts invested by foreign firms in renewable energy is not recorded as FDI because the majority of investments conducted in this sector are executed under the "project financing" modality, in which only a small part of the investment is financed with the company's capital (between 10% and 20%) and the rest with bank loans.

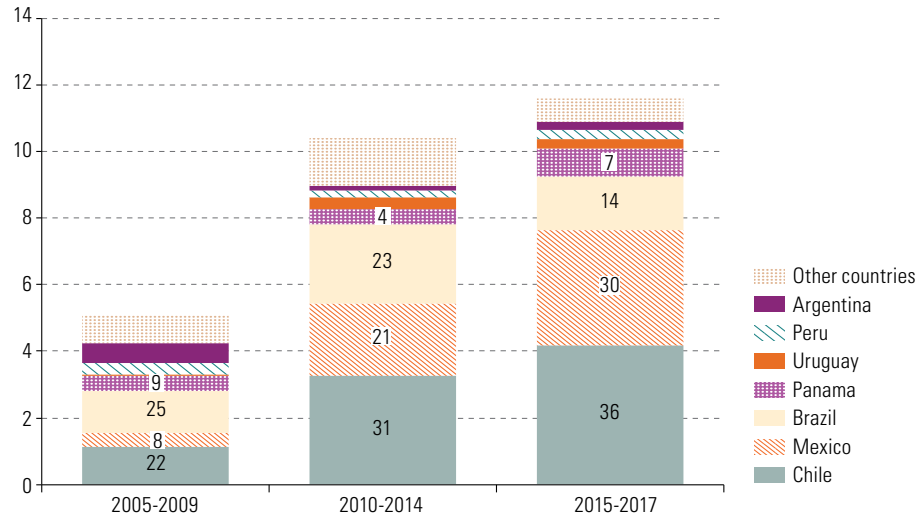


Figure I.15
Latin America and the Caribbean: FDI announcements in renewable electrical power generation by destination country, 2007–2016
(Billions of dollars and percentages)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of *Financial Times,* fDi Markets.

In recent years, investments have also increased in tourism, a key sector for the economies of the Caribbean and of significant importance for other countries in the region. This sector was badly hit by the crisis in the developed countries; during the first part of the 2010 decade tourist arrivals and investments in the sector both fell heavily. This situation has reversed in recent years, and investments in the sector have picked up since 2015.

4. China is investing less worldwide, but more in Latin America

Identifying the country of origin of FDI flows on the basis of national accounts tends to be imprecise as this shows only the immediate bilateral origin of funds, and does not identify transactions conducted through third-party markets. Transnational companies have increasingly complex organizational structures and often investment does not come directly from the parent company, but instead through subsidiaries located in territories offering tax benefits. In addition, at the time of writing, not all the region's countries had reported data by origin; thus, the analysis herein refers to available official statistics and to the largest mergers and acquisitions transactions for which it has been possible to identify the origin of the transnational firms involved in 2017.[5]

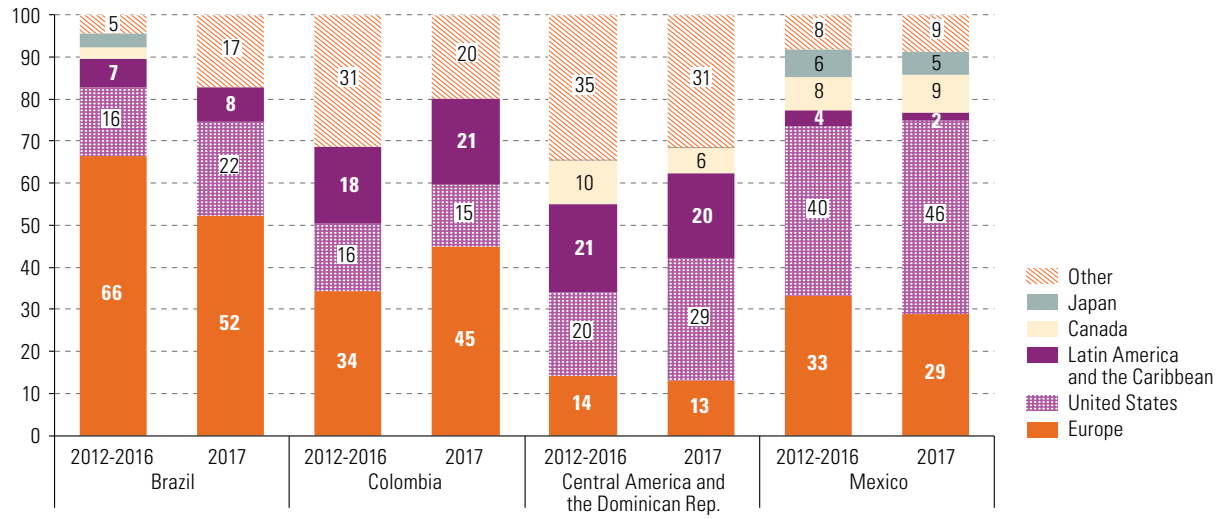
On the basis of investment flows, there were no major changes in the countries of origin of FDI in 2017. The United States was once again the largest investor —accounting for 28% of identifiable funds— while European countries together represented 42% of the total. Within Europe, the largest investment flows came from the Netherlands (13% of the total), Germany (6%), Spain (6%) and France (4.5%).[6] In terms of intraregional investment, Mexico accounted for the largest share (3.0%), followed by Chile (1.3%).

[5] Information for analysis of flows by country of origin was provided by Brazil (excluding reinvested earnings), Colombia and Costa Rica (based on the fifth edition of the *Balance of Payments and International Investment Position Manual* (BPM5)), the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras and Mexico (sectoral data based on BPM5). Overall, FDI inflows from identifiable countries of origin accounted for 73.2% of total FDI in 2017.

[6] As mentioned previously, investments from the Netherlands do not strictly reflect the presence of Dutch firms operating in the region.

FDI in the region was heterogeneous as regards country of origin, with greater activity by European firms in South America, and by United States companies in Central America and Mexico, where the influence of the North American Free Trade Agreement (NAFTA) in attracting investments is evident. The United States accounted for close to 50% of inward FDI in Mexico in 2017, followed by Canada, which also represented a significant share. In turn, European firms made the largest investments in South America (see figure I.6), while investments by trans-Latins accounted for a substantial percentage of flows into Colombia and Central America.

Figure I.16
Latin America and the Caribbean (selected subregions and countries): origin of FDI inflows, 2012–2016 and 2017
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.

Measured by mergers and acquisitions transactions completed in 2017, China was the largest investor in the region.[7] Although the country occupied the sixth position measured by number of transactions (15 for the year), the size of these investments —totalling US$ 18 billion— accounted for 42% of the total. Participation by European firms was lower than the previous year (13% of total volume), as was the case of the United States and Canada (7% and 6%, respectively), although these two countries continue leading in terms of the number of transactions. In Canada's case, these were mainly acquisitions in the mining sector, owing to that country's active involvement in exploration, and in the case of the United States, investments went mostly to Brazil and Mexico, and to a lesser extent to Argentina and Chile, with no clear sectoral orientation.

Chinese acquisitions occurred almost exclusively in Brazil: of the 20 major transactions in the year, Chinese firms participated in 5 (see box I.4). Most of the transactions were in energy —a strategic sector in China's international expansion plans— and in agriculture, where the country has also been active in international markets, mainly in the seeds business.

[7] On the basis of information from Bloomberg, includes only transactions in which one of the parties is a listed company.

Table I.4
Latin America and the Caribbean: 20 largest cross-border mergers and acquisitions, 2017

Company	Country of origin	Assets acquired	Asset location	Country of seller	Sector	Amount (billions of dollars)
State Grid	China	CPFL	Brazil	Brazil	Energy	6.7
GIC, Brookfield Infrastructure Partners, China Investment Corporation	Canada, Singapore, China	Nova Transportadora do Sudeste (90.0%)	Brazil	Brazil	Energy	5.2
State Power Investment Corporation	China	São Simão	Brazil	Brazil	Renewable energy	2.255
Grupo Lala	Mexico	Vigor Alimentos (99.99%)	Brazil	Brazil	Food	1.837
Enel	Italy	Celg Distribuiçao	Brazil	Brazil	Energy	1.429
CITIC Agricultural Industry Fund Management	China	Dow AgroSciences Sementes & Biotecnologia Brasil	Brazil	United States	Agricultural	1.1
Heineken	Netherlands	Brasil Kirin Holdings	Brazil	Japan	Beverages	1.09
Shandong Gold Mining	China	Mina Veladero (50.0%)	Argentina	Canada	Mining	0.96
Brookfield Asset Management	Canada	Odebrecht Ambiental (70.0%)	Brazil	Brazil	Infrastructure - Water distribution	0.768
Obrascón Huarte Lain (OHL)	Spain	OHL Mexico (28.34%, previously 58.0%)	Mexico	Mexico	Construction	0.749
Glencore	Switzerland	Volcan (15.61%, previously 7.7%)	Peru	Peru	Mining	0.734
Delta Air Lines	United States	Grupo Aeroméxico (32.0%, previously 4.2%)	Mexico	Mexico	Transport	0.614
Canada Pension Plan Investment Board, Votorantim Energia	Canada, Brazil	Ventos do Araripe III wind farm, 359 MW	Brazil	Brazil	Renewable energy	0.544
Actis LLP	United Kingdom	Solar energy assets 578 MW	Brazil	United States	Renewable energy	0.525
Rosneft	Russian Federation	Petromonagas (23.3%, previously 16.7%)	Venezuela (Bolivarian Republic of)	Venezuela (Bolivarian Republic of)	Oil and natural gas	0.5
American Tower	United States	KIO Networks Communication Infrastructure/Mexico	Mexico	Mexico	Telecommunications	0.5
Southern Cross Group	Argentina	Petrobras Chile Distribucion	Chile	Brazil	Oil and natural gas	0.464
BTG Pactual	Brazil	Weyerhaeuser assets	Uruguay	United States	Forestry	0.403
Merck & Co.	United States	Vallée (93.0%)	Brazil	Brazil	Pharmaceuticals	0.4
Globalvia	Spain	Ruta 160 tolls	Chile	Spain	Services	0.396

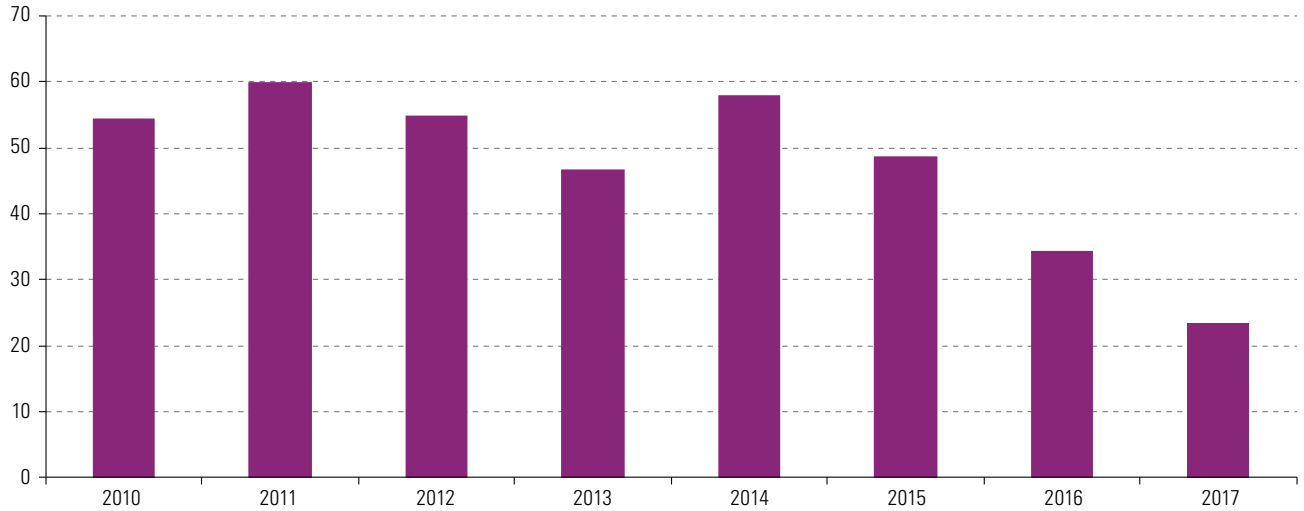
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

D. Latin American overseas investment fails to pick up

Outward FDI from Latin American countries, which accounts for investments by trans-Latins abroad, fell for the fourth consecutive year in 2017 to US$ 23.416 billion, 34% down on 2016 levels (see figure I.17). Flows from Brazil fell by 51% in 2017 and, just as in 2016, outward FDI from the region's other countries continued to decline.

The bulk of the region's outward FDI is attributable to Brazil, Chile, Colombia and Mexico, which in 2017 accounted for 90% of the total, although firms from other countries also invest overseas, albeit on a much smaller scale (see table I.5). Investments by Peruvian and Costa Rican companies had been on an upward trend —representing US$ 801 million and US$ 894 million, respectively in 2012— but have fallen in recent years. Considering the size of their economies, firms from Guatemala, Honduras and Trinidad and Tobago have also made sizeable investments abroad (see annex table I.A1.6).

Figure I.17
Latin America and the Caribbean: outward FDI flows, 2010–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of preliminary figures and official estimates at 6 June 2018.

Table I.5
Latin America and the Caribbean (selected countries): outward FDI flows, 2005–2017
(Millions of dollars and percentage variation)

	2005-2009[a]	2010	2011	2012	2013	2014	2015	2016	2017	Absolute variation 2016-2017 *(millions of dollars)*	Relative variation 2016-2017 *(percentages)*
Argentina	1 471	965	1488	1 055	890	1 921	875	1 787	1 156	-631	-35
Brazil[b]	14 067	26 763	16 067	5 208	14 942	26 040	13 518	12 816	6 268	-6 548	-51
Chile	5 117	9 461	20 252	20 556	9 888	12 800	16 025	7 465	4 824	-2 641	-35
Colombia	2 786	5 483	8 420	-606	7 652	3 899	4 218	4 517	3 690	-828	-18
Mexico	7 295	8 039	12 331	18 701	13 458	6 965	12 252	6 595	6 116	-478	-7
Venezuela (Bolivarian Republic of)[c]	1 227	2 492	-370	4 294	752	1 024	-1 112	...	...		
Latin America and the Caribbean	**33 235**	**54 408**	**60 006**	**54 797**	**46 803**	**57 913**	**48 802**	**35 544**	**23 416**	**-12 129**	**-34**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of preliminary figures and official estimates at 6 June 2018.
[a] Simple averages.
[b] The 2005–2009 figure does not include reinvested earnings, and is therefore not directly comparable to the figures from 2010 onward.
[c] Data for 2015 refer to the first three quarters.

The same set of circumstances that have affected inward FDI have also led to a reduction in outward FDI. Many of the major trans-Latins operate in the mining (Vale, Grupo Mexico) or oil sectors (Petrobras, Petróleos Mexicanos (PEMEX), Ecopetrol, Petróleos de Venezuela, S.A. (PDVSA)), and have thus been affected by drops in mineral and oil price. In addition, a significant portion of foreign investment by trans-Latins goes to other countries in the region, and has thus been affected by the recent economic crisis. Even though external conditions were more favourable in 2017, owing to stronger global economic activity and the upturn in commodity prices (ECLAC, 2018), this scenario has not yet translated into a renewed expansion of investment overseas.

Mexican outward FDI remained at similar levels to that of 2016 (US$ 6.116 billion), well below the average for previous years. Many of Mexico's main transnational firms became overindebted during the boom years and later faced difficulties amid devaluation and rising interest rates (Basave Kunhardt and Gutiérrez-Haces, 2017). This has forced some companies to divest their external assets, such as the case of ICA in several countries of the region and CEMEX in the Philippines (for US$ 507 million).

However, Mexican trans-Latins still dominate acquisitions outside the region, with two transactions of some US$ 2 billion, and 4 of the 10 largest acquisitions in the region (see table I.6).

Table I.6
Latin America and the Caribbean: the 10 largest cross-border acquisitions by regional firms, 2017

Firm	Country of origin	Assets acquired	Asset location	Country of seller	Sector	Amount *(millions of dollars)*
Grupo México	Mexico	Florida East Coast Holdings	United States	United States	Transport	2 100
Grupo Lala	Mexico	Vigor Alimentos	Brazil	Brazil	Food	1 837
Natura	Brazil	Body Shop International	United Kingdom	France	Retail	1 120
Bimbo	Mexico	East Balt	United States	United States	Food	650
Southern Cross Group	Argentina	Petrobras Chile Distribucion	Chile	Brazil	Distribution of hydrocarbons	464
BTG Pactual	Brazil	Weyerhaeuser assets	Uruguay	Uruguay	Forestry	403
Brasil Foods (BRF) (60%), Qatar Investment Authority (40%)	Brazil, Qatar	Banvit Bandirma Vitaminli Yem Sanayii ASA (79.48%)	Turkey	Turkey	Food	400
Vitro	Mexico	Glass manufacturing of original equipment manufacturers (OEM)	United States	United States	Manufacturing	310
ISA	Colombia	Transmissora Aliança de Energia Elétrica (14.9%)	Brazil	Brazil	Electrical power	309
JBS	Brazil	Plumrose USA	United States	Denmark	Food	230

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

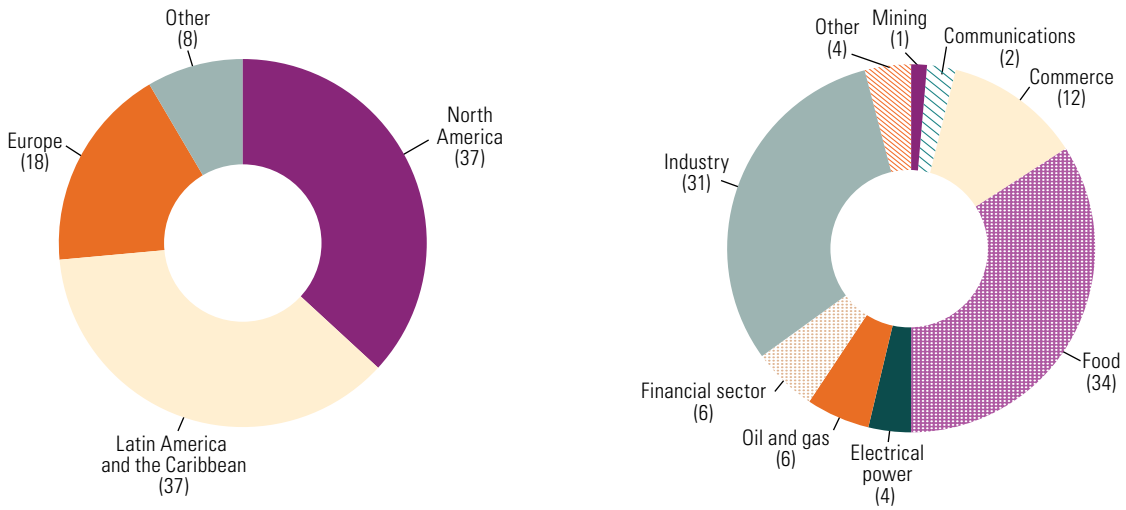
Outward FDI from Brazil totalled US$ 6.268 billion in 2017, less than half of the average level recorded in recent years. Large Brazilian firms —which embarked on an ambitious international expansion effort between 2006 and 2014— have had to halt their growth plans owing to the internal economic crisis (which hindered their performance) and the rise in interest rates in the United States (which forced them to reduce the debt they had contracted to finance their expansion). The national assets and the sales in national currency of Brazil's largest multinational companies fell by 14% and 19%, respectively, between 2016 and 2016 (Sheng and Carrera Jr., 2018), which has hampered their capacity to invest abroad. In addition, the country's fiscal crisis led the Government of Brazil to revise its policy of supporting the internationalization of these companies (ECLAC, 2014).

Petrobras, Brazil's largest company, has continued with its divestment plans outside the country to focus on its extraction activities within its borders, and also sold its assets in Chile to Argentine firm Southern Cross for US$ 464 million (Sheng and Carrera Jr., 2017). Conversely, other firms continued with their investments abroad and, among the 10 largest acquisitions by trans-Latins in 2017, three were asset purchases by Brazilian firms, one of which exceeded US$ 1 billion (see table I.6).

In 2017, there were also declines in outward FDI from Argentina (35%), Chile (35%) and Colombia (18%). In Chile, the largest investors in recent years —such as airline LATAM or retailers Cencosud and Falabella—announced no significant projects in 2017, nor did they engage in large acquisitions. As for the Bolivarian Republic of Venezuela, no data have been available since 2015. Although negative flows had been recorded that year, in previous years the country had been one of the region's main investors overseas. Its largest firm, the State-owned oil company PDVSA, owns considerable assets abroad, especially its refining and distribution subsidiary, Citgo, in the United States. In 2017, PDVSA sold a stake of this subsidiary to the Russian firm Rosneft.

Most of the investments made by trans-Latins in 2017 went to other countries in the region; intraregional FDI remains very important for many of the countries, especially in Central America and in the smaller South American economies, such as Ecuador, Paraguay and Uruguay. Similarly, most of the mergers and acquisitions completed by trans-Latins targeted companies in other countries in the region or in North America, with most of the activity focused on manufacturing and food industries (see figure I.18).

Figure I.18
Cross-border mergers and acquisitions of trans-Latins, by region and target sector, 2017
(Percentages of the total)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

E. Conclusions

FDI inflows to Latin America and the Caribbean fell for the third consecutive year and stand 20% below the peak level recorded in 2011. In terms of its weight in the economy, FDI is now back at 1997 levels.

The region's economy has been recovering after several years of recession and is expected to grow by 2.2% in 2018, on the back of oil and metals prices, which in the last two years have recovered much of the ground previously lost. However, the recession in 2015 and 2016 still weighs on the accounts of many companies, and political instability in many countries could lead to a downturn in short-term investment; accordingly, FDI inflows will likely be similar to 2017 figures, with a margin of 2% on either side.

Trade and economic measures in the United States, Europe and China, the protection of technology assets and reshoring process taking place in many developed economies indicate a shift in interest in these countries towards national investment dynamics.

Efforts to recover and add value to national resources and capacities will not necessarily lead to lower global economic growth, but could mean that the engines for growth will change in the coming years.

In preparation for new global scenarios, the region should prioritize local capacity-building. The yearly volume of FDI inflows is not an indicator of the quality for that investment. Efforts need to focus on attracting investments that contribute to sustainable development and structural change in the region. In this connection, it is significant that most of the drop in FDI in recent years has taken place in the extractive industries. The upturn in commodity prices may encourage higher levels of investment, but it cannot be taken for granted that natural-resource-specialized production will return to driving development in the region.

The trends towards technological change and sustainable development will limit global demand for hydrocarbons and other raw materials; while this may dampen growth and tax revenues for many of the region's countries, it may also pave the way for genuine diversification. It is here that FDI can play a key role, especially if the region's countries are capable of attracting investments to sectors and processes that can help build local capacities.

Certain sectors have been able to tap FDI to develop and produce positive effects on employment, productivity or economic stability. Cases that stand out are the increasing investments in the automotive sector in Mexico and Brazil and manufacturing and services for export in Central America and the Dominican Republic, which will be examined in detail in chapter III. But these cases are still not enough to drive a transformation of the region's production structure.

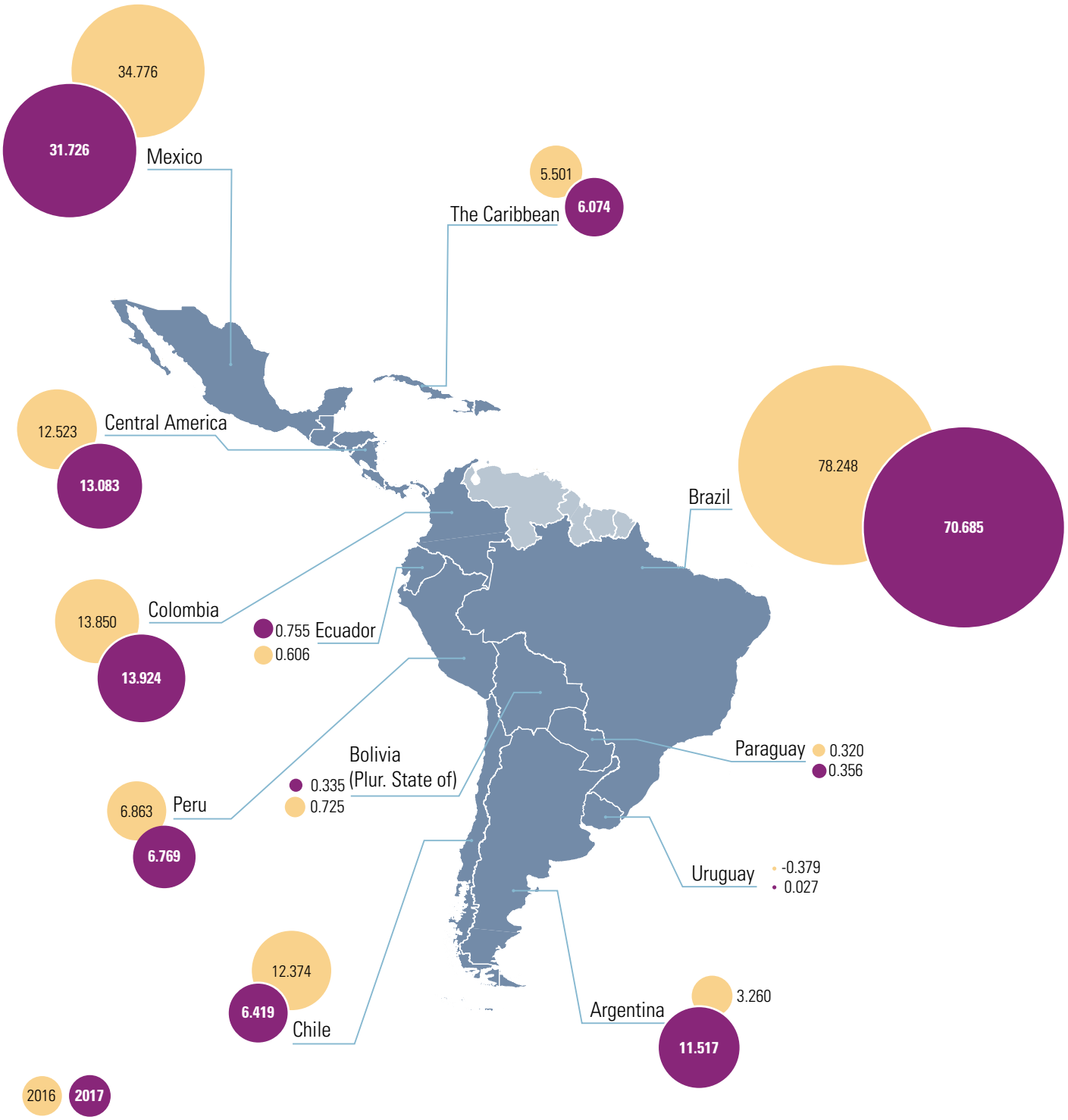
In order to meet the Sustainable Development Goals greater investments will be needed to increase productivity, reduce poverty and broaden basic services, and some of these will need to come from FDI. This has already occurred in some sectors —for example, telecommunications connectivity has been achieved in many countries thanks to investments by foreign companies— but many others have yet to make major progress. The Sustainable Development Goals will also demand different types of investments to create a more sustainable production structure, transforming many of the most polluting activities and reducing the weight of others. The shift towards renewable sources of electrical power generation is just one example of how FDI can assist in this transformation process. Efforts are also needed to make economies more equitable, and this will require closing productive gaps, for example, through policies aimed at promoting linkages between small and medium-sized enterprises with the most productive transnational companies.

This means that FDI attraction policies need to be integrated into sustainable development plans in the region, affording particular importance to building local capacities, both for attracting FDI and for tapping its advantages.

F. Country analysis: FDI grew in most economies

In 2017, FDI inflows grew in the Caribbean and Central America, but fell in Mexico and South America, owing to declining investment in Brazil, Chile and Peru (see map I.1). The smaller economies in the region received larger capital inflows, but this did not offset the decline in flows to the larger economies.

Map I.1
Latin America and the Caribbean (selected subregions and countries): foreign direct investment inflows, 2016 and 2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.

Note: The subtotal for the Caribbean in 2017 excludes Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and the Grenadines.

In 2017, foreign direct investment to Latin America and the Caribbean was equivalent to 3.1% of GDP in the region, a similar level to that recorded annually since 2000. Generally, FDI has a larger weight in the smaller economies (and a smaller share in the larger economies). Panama stood out as the largest recipient of FDI in the region, in relation to the size of its economy (see figure I.19).

Figure I.19
Latin America and the Caribbean (24 countries): foreign direct investment inflows, 2017
(Percentages of GDP)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.

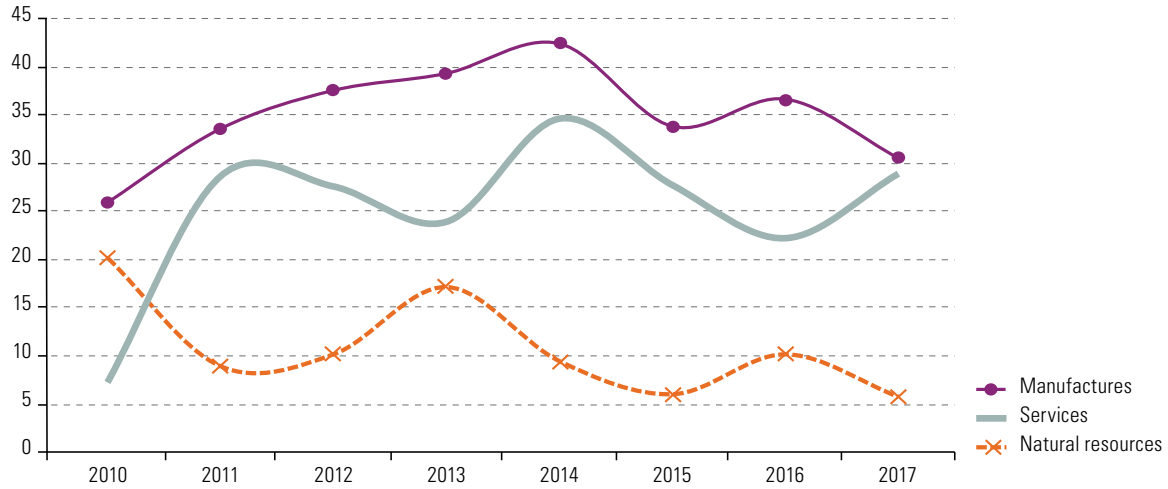
1. Brazilian recovery tails off

After recovering in 2016, foreign direct investment inflows to Brazil fell by 9.7% in 2017, totalling US$ 70.685 billion. Equity capital inflows rose and accounted for 76% of total FDI, a level consistent with the magnitude of mergers and acquisitions for the year, whereas the downside was attributable to the decline in reinvested earnings and in intercompany loans. In 2017, the share of both components fell to its lowest level in the last eight years (see annex table I.A1.4). As a result, the country was unable to regain the levels it had recorded at the beginning of the decade: in 2010–2014 inward FDI recorded an annual average of US$ 88.6 billion, whereas in 2015–2017 the figure stood at US$ 74.6 billion.

The most significant drop occurred in natural resources, especially in hydrocarbon extraction and metal mining (see figure I.20).[8] In metal mining, equity capital inflows declined and intercompany loans recorded negative flows. The subdued recovery in the price of minerals and the excess capacity resulting from previous investment during the commodity price boom suggest that it will be difficult for the metal mining sector to reverse its downward trend in the short term. Accordingly, the share of natural resources in FDI inflows fell from 19.2% of the total between 2010 and 2014, to an average of 10.7% in the past three years (see annex table I.A1.2). In the hydrocarbon sector, the substantial adjustment in investment by PETROBRAS held back investment from that company's foreign partners.

[8] The analysis of FDI inflows by industry includes net flows of equity capital and net intercompany loans (which accounted for 92.6% of total flows), and excludes reinvested earnings, owing to lack of available data.

Figure I.20
Brazil: inward foreign direct investment, by industry, 2010–2017
(Billions of dollars)

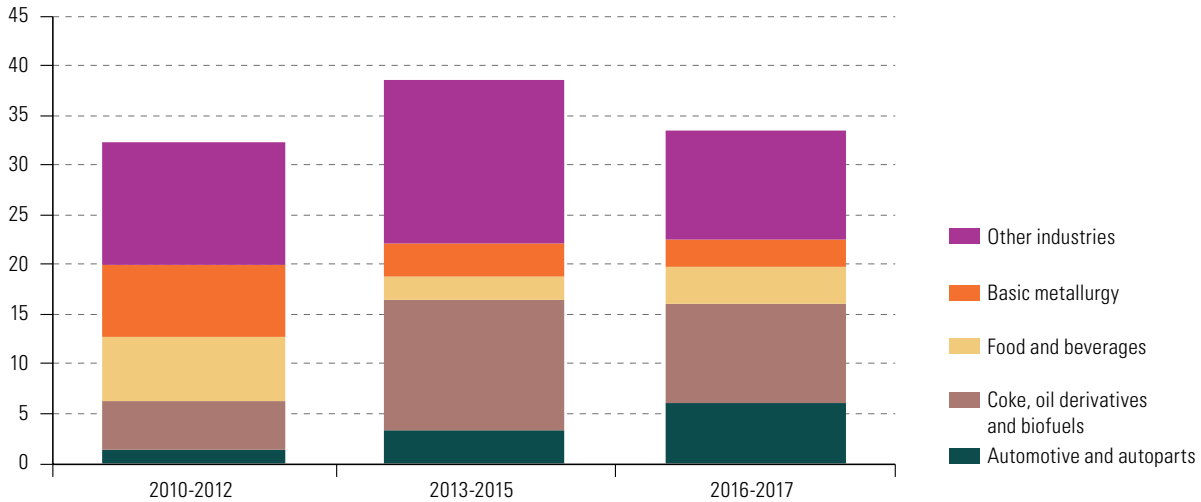


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data provided by the Central Bank of Brazil.
Note: Data exclude FDI inflows from reinvested earnings.

The manufacturing sector attracted the largest share of FDI, with investments totalling US$ 30.497 billion (46.8% of the total). Investment fell compared to 2016 levels (16.8%), although this was largely attributable to the contraction of intercompany loans in the coke, oil derivatives and biofuels sector (representing 22.8% of FDI in manufacturing), which received US$ 6 billion less than in 2016. Aside from this drop, Brazilian industries followed mixed trends (see figure I.21). The automotive, food and basic metallurgy industries attracted large flows of capital (accounting for 21%, 14.7% and 12.8%, respectively, of total FDI in the manufacturing sector for the year), with the three sectors recording higher levels than in 2016. Flows to the automotive industry came mostly via intercompany loans, while in food and metallurgy they were attributable to equity capital. In turn, investments in the chemical, machinery, and electrical and electronic equipment industries trended downward. With the advancement of the digital economy and the consequent changes that will be required for the manufacturing industry to adapt to new production paradigms, the fifth consecutive year of contraction in inward FDI in computer equipment, electronic and optical products suggests it will be difficult for these manufacturing capacities to develop further in Brazil.

Inward FDI in the services sector was stronger, mainly owing to the acquisition of enterprises in electricity and gas. Investments in 2017 reached US$ 28.853 billion, up 30.1% compared with 2016, mainly on account of fresh capital inflows (intercompany loans recorded negative flows of US$ 3.11 billion), with the electricity and gas sector accounting for 42.1% of the total. Commerce, transport and storage were also recipients of substantive investments, each with FDI inflows representing close to 10% of the total, albeit following different trends. FDI flows to commerce declined with respect to 2016 (down 39%), whereas the transport and storage sectors recorded larger inflows. Investment in telecommunications fell sharply (with a net negative result due to intercompany loans) while on the other hand FDI inflows to information technology services increased, with annual foreign investment in this sector averaging US$ 700 million in the past five years.

Figure I.21
Brazil: foreign direct invesment flows to manufacturing, by selected industries, 2010–2017
(Billions of dollars, average for the period)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data provided by the Central Bank of Brazil.
Note: Data exclude FDI inflows from reinvested earnings.

Investments in energy reflected the high level of mergers and acquisitions activity. Among the 20 largest cross-border transactions in Latin America and the Caribbean, 11 targeted companies in Brazil, with total investments reaching US$ 21.847 billion (see table I.4). The acquisition of CPFL, one of the biggest Brazilian energy companies, by State Grid Corporation of China, was the largest transaction of the year at US$ 6.7 billion. The firm has been operating in the Brazilian electricity sector for over a century, specifically in the generation and distribution segments —where it holds a 14.3% market share (9.1 million clients)— as well as in the energy trading business, thus affording the Chinese company a solid entry to the Brazilian market. This acquisition is framed within China's transnational investment strategy, which seeks to expand that country's international presence in infrastructure, energy and utilities, and was accompanied by other significant transactions in Brazil in 2017, such as the acquisition of gas distributor Nova Transportadora do Sudeste, for US$ 5.2 billion, or the procurement of a 30-year concession to operate the São Simão hydroelectricity plant, for US$ 2.255 billion. In addition to transactions by Chinese companies, energy assets were also sold to Enel (Italy), Actis (UK) and the Canada Pension Plan Investment Board, thus confirming the continued interest of transnational capital in this sector.

Brazil remains the most important market for FDI in the region and continues to be one of the world's largest investment recipients. According to the United Nations Conference on Trade and Development (UNCTAD, 2018b), the country was ranked as the fourth largest FDI recipient in the world. The expectation in the short term is that FDI flows will remain at similar levels to the average of the last three years, as a result of the continued presence of transnational firms in the country and positive forecasts for GDP growth in 2018, estimated at around 2% (ECLAC, 2018). That said, greenfield investment announcements have been declining since the beginning of the 2010 decade, which may lead to stagnating flows in the medium term. On average, over the past three years, annual announcements have been valued at around US$ 14 billion, almost US$ 11 billion down on the average levels of the three preceding years (2012–2014) and 70% below the peak levels reached in 2011. This decline can

be linked to the curbing of new investments in the metal mining sector —known for its large-scale projects— but also to the sharp drop in the value of new investment announcements in the telecommunications, automotive and financial services sectors.

2. Elsewhere in South America, FDI flows to Argentina increased significantly

FDI inflows into **Colombia** reached US$ 13.924 billion in 2017, up 0.5% on 2016 levels and close to those recorded between 2011 and 2014. Reinvested earnings increased significantly for the year, especially in the fourth quarter, reflecting the increase in the price of oil, as well as the overall improvement of the economy in the second half of the year (ECLAC, 2018).

The transport and telecommunications sector was the main FDI recipient in 2017 (US$ 3.136 billion), matching investment flows to the oil sector (US$ 3.135 billion), traditionally the largest recipient of FDI in Colombia. Between 2011 and 2014, the oil sector over received US$ 5 billion annually, but these inflows halved in 2015 and 2016. The rise recorded in 2017, and in the first months of 2018, reflects the pick-up in investment resulting from the increase in prices. The mining sector also benefited from this situation, with investments in 2017 rising to US$ 953 million. FDI in the manufacturing sector also increased, almost reaching its highest level in the past 10 years, at US$ 2.523 billion.

As in previous years, Spain (US$ 2.616 billion) and the United States (US$ 2.121 billion) were the largest investors. Mexico was the third largest investor in 2017 with FDI totalling US$ 1.717 billion, including an investment by Grupo Salinas, which injected an additional US$ 100 million into its fibre-optic infrastructure subsidiary, Azteca Comunicaciones Colombia. Investments from Spain and Mexico increased owing to the recapitalization of the subsidiaries of Telefónica and Claro, after a Colombian court ordered the companies to pay the Colombian Government US$ 500 million and US$ 1 billion in compensation, respectively, for contractual infringements in the framework of the concessions awarded to them in 1994.

FDI in **Argentina** recovered in 2017 from the sharp decline recorded in 2016, with inflows jumping 253% to US$ 11.517 billion. As a result, investment inflows to Argentina returned to the average levels recorded in the early part of the 2010 decade (see table I.3). The rise was attributable to a larger volume of reinvested earnings —which, owing to regulatory changes, had fallen substantially in 2016— and to the increase in intercompany loans, while equity capital inflows declined (see annex table I.A1.4).

Argentine companies continued to be viewed as attractive targets for mergers and acquisitions, especially in the mining and services sectors. Among the largest 20 transactions in the region was the acquisition by China's Shandong Gold Mining of a 50% stake in the gold and silver mine Veladero, owned by Canada's Barrick Gold Corporation, in a deal valued at US$ 960 million. In addition, a dozen smaller operations were completed, mostly involving companies from Canada and the United Kingdom. Canadian firms have been expanding their investments in lithium mining— the region has huge potential for producing the strategic mineral used in electronic products— and completed several transactions valued at between US$ 29 million and US$ 60 million. In a smaller transaction, albeit in the highly promising biopharmaceuticals industry, Grupo Biotoscana —with headquarters in Uruguay and controlled by the United States investment fund Advent International— acquired Laboratorio DOSA S.A., a pharmaceutical laboratory specializing in treatment for severe lung diseases, for US$ 29.9 million.

According to information in the *Financial Times* database, fDi Markets, new investment announcements in Argentina did not sustain the strong momentum recorded in 2016, but rather remained at average levels for the decade, with total new projects estimated at US$ 4.5 billion, a significant share of which corresponded to projects in the automotive, hydrocarbons, mining and telecommunications sectors. Germany's Volkswagen made the year's largest announcement, with a planned investment of US$ 650 million to modernize one of its plants, where it will manufacture a new SUV model as from 2020. Dongfeng Motor Corporation of China and General Motors of the United States announced projects valued at US$ 300 million. Dongfeng will install a manufacturing and assembly plant for electrical buses, while General Motors plans to begin manufacturing a new Chevrolet model as from 2020.

FDI in **Peru** remained largely flat in 2017 compared with the previous year, totalling US$ 6.769 billion, and is still far from the inflows recorded a few years ago. There was a noteworthy increase in reinvested earnings in 2017, which accounted for 81% of total inward FDI. This reflects the fact that foreign companies are once again making a profit; this is especially true of mining concerns, which have traditionally been the dominant FDI recipients in Peru and have recently benefited from price increases. The upward trend in prices led to a slight upturn of investments in mining exploration —the first link in the production chain— which had been declining steadily since 2012. Also of significance in this sector was the acquisition of a share in local mining company Volcán, by Switzerland's Glencore, for a total of US$ 734 million. In terms of the portfolio of planned investments, Chinese companies remain the largest investors in the Peruvian mining sector, accounting for 22% of total FDI, followed by Canadian firms, at 19%.

The telecommunications sector took centre stage among projects announced by companies in 2017, with investments announced by Chile's Entel (US$ 390 million), Mexico's América Móvil and Spain's Telefonica (US$ 163 million each), and the United Kingdom's Virgin Mobile (US$ 137 million). Another important investment announcement was the US$ 204 million announced by DP World, the United Arab Emirates company responsible for managing the Muelle Sur del Callao container terminal since 2006.

If prices continue trending upwards, additional investments in mining may come to fruition in 2018. This may also occur in telecommunications —to increase 4G coverage— and the energy sector, in view of tenders for potential renewable energy that have been awarded to Spanish, French and Italian companies.

In 2017, FDI flows to **Chile** fell for the third consecutive year, standing at US$ 6.419 billion, similar to 1993 levels measured as a percentage of GDP (2.3%). This prolonged drop in investment levels can be linked to the decline in the price of copper between 2011 and 2016, as well as to excess capacity built during the commodity price boom.

Equity capital inflows declined in 2017, as did intercompany loans, which recorded negative flows for the first time in ten years, on account of the beginning of payments on debts accrued in the last five years (see annex table I.A1.4). These developments were in part offset by the rise in reinvested earnings, which have been growing as a share of FDI inflows since 2015, possibly as a result of incentives provided by the new semi-integrated tax system.[9]

[9] The 2014 tax reform implemented two systems through which companies could pay capital gains tax: the attributed income option and the semi-integrated system. The first (the attributed income regime) taxes all corporate gains regardless of whether they are reinvested or not. Thus, the tax paid by the company effectively becomes a tax credit on the business owner's personal income tax statement. The second (the semi-integrated system) only taxes earnings that are withdrawn, so the tax paid by the company is only considered a partial tax credit on the business owner's personal income tax statement. The new semi-integrated system also works as an incentive for reinvesting earnings and, according to Chile's Internal Revenue Service, is the system preferred by large corporations which also invest and pay taxes abroad (Internal Revenue Service, Chile, 2017; Pulso, 2018).

Project announcements remained at a similar level to previous years and were estimated at around US$ 4.5 billion. These include renewable energy and mining projects, as well as an announcement by Dutch brewer Heineken, through its subsidiary Compañía Cervecerías Unidas (CCU), of a US$ 600 million investment to expand its operations in the country.

FDI inflows are expected to increase in 2018, as previously-announced projects materialize —especially in the renewable energy sector— and on account of improved trends in copper prices since the beginning of 2017, which could lead to increases in mining production and improve the financial viability of new projects. In addition, in 2018 Bordeaux Holdings, a subsidiary of UnitedHealth Group headquartered in the United States, acquired the health-care services company Banmédica for US$ 3.391 billion.

The **Plurinational State of Bolivia** was the recipient of FDI totalling US$ 725 million in 2017, more than double the investment recorded the previous year, albeit still well under the figures for 2012 and 2013, which exceeded US$ 1 billion. The jump in inflows was due primarily to the increase in reinvested earnings. Natural resources appeal strongly to foreign investors, and the hydrocarbon and mining sectors attracted half of gross capital inflows (excluding divestment), recording 31.6% and 20.7% of total FDI, respectively. The acquisition of Minera Alcira by the Canadian firm New Pacific Metals for US$ 36 million was one of the largest transactions of the year. FDI in manufacturing also grew, with inflows standing at 21.2% of total FDI, while investment in the services sector declined. A joint project by State-owned Yacimientos de Litio Bolivianos (YLB) and Germany's ACI Systems —which was awarded a tender for the production of lithium batteries— has generated high expectations, with two plants to be built by the German firm for a total of US$ 1.3 billion (Ministry of Hydrocarbons and Energy, 2018).

In 2017, **Ecuador** FDI dropped by 20% to US$ 606 million, a similar inflow to that recorded between 2011 and 2014. This was mainly attributable to the extractive sector, which had received annual investments of US$ 500 million in the previous two years, but only US$ 64 million in 2017. Ecuador's extractive sector is dominated by oil production, where many transnational corporations operate in partnership with the State-owned Empresa Estatal de Petróleos del Ecuador (PETROECUADOR). Oil production has fallen over the past two years and in March 2018 the Government auctioned oil exploitation rights with the aim of attracting investments of around US$ 800 million.

The manufacturing sector attracted the largest investments (US$ 143 million), followed closely by agriculture and fishing (US$ 124 million). In the latter, Danish company Schouw & Co. acquired a 70% stake in the Ecuadorian shrimp producer Alimentsa for US$ 127 million. Despite this, China was the largest registered investor in Ecuador (US$ 85 million), closely followed by Spain (US$ 80 million). One third of total incoming FDI in 2017 came from other countries in the region, a lower percentage than in other years.

In 2017, **Paraguay** was the recipient of inward FDI totalling US$ 356 million. Despite this figure representing a 11.1% increase compared with 2016, inflows have yet to return to the peak recorded during the commodities price boom, when large flows of capital reached the country, mainly targeting its agricultural sector. The increase in reinvested earnings was the main driver of FDI growth, with the other components remaining flat. In the services sector, Swedish company Millicom continued to expand its presence in the region through its subsidiary Tigo and acquired TV Cable Paraná in a transaction valued at US$ 19 million.

Inward FDI in **Uruguay** has fallen sharply in the past two years, with negative flows in 2016 and total inflows of US$ 27 million in 2017. Equity capital inflows decreased by 31.5%, totalling US$ 799 million, which, coupled with the negative flows in intercompany loans, led to negative FDI in net terms (see annex table I.A1.4). Despite this, sizeable

transactions were completed in the forestry sector, with the United States group Weyerhaeuser selling its assets to a Brazilian consortium for US$ 403 million, and in the hotel sector, as the Chilean firm Enjoy S.A. acquired the remaining 55% in Conrad Punta del Este, for US$ 180 million, thus taking total control of the firm. A project by Finnish company UPM-Kymmene to build a second paper pulp mill for an estimated US$ 4 billion has generated great expectations.

There have been no data on FDI in the **Bolivarian Republic of Venezuela** since 2015. The severe economic crisis would have no doubt led to a drop in foreign investment, but there are still foreign companies operating in the country. At the beginning of the century, the Bolivarian Republic of Venezuela was one of Latin America's most active markets for transnational companies, behind only Chile, Panama and the Plurinational State of Bolivia. During the 2000 decade, the Government reduced the space available for FDI and nationalized many foreign companies in heavy industry, mining and banking, among other sectors. By 2012, the weight of foreign investment in the economy had decreased significantly, but FDI stock still stood at close to US$ 40 billion.

In recent years, some transnational firms have decided to cease doing business as a result of operational problems and falling domestic demand (GDP declined by one third between 2013 and 2017, and another 5.5% contraction is expected in 2018) (ECLAC, 2018). That was the case of the largest automotive companies, such as United States manufacturers General Motors and Ford, which had been winding down their production and finally closed their plants in 2015. Many other companies have reduced their presence, but remain operational. Spanish telecoms company Telefónica has a user base of 9 million mobile lines in the country, with a 40% market share, and reported total operational income in the country of €106 million (Telefonica, 2017).

Some transnational companies continue to operate in the oil sector, always in partnership with the State-owned Petróleos de Venezuela, S.A. (PDVSA). This is the case of Chevron (United States), Repsol (Spain), Gazprom (Russian Federation), CNPC (China), Shell (United Kingdom and Netherlands), Eni (Italy), Statoil (Norway), Total (France) and Oil and Natural Gas Corporation (ONGC) (India). Although there are no investment data available for recent years, investments have presumably decreased significantly, as proven by the fall in the country's oil production, which in April 2018 was estimated to be 40% lower than a year earlier (*Financial Times*, 2018a). Many foreign companies consider that their assets in the country have been impaired and have thus written them off. For example, oil services company Halliburton wrote off US$ 647 million in 2017 and another US$ 312 million in 2018, while Schlumberger, also in that sector, wrote off US$ 938 million (*Financial Times*, 2018b).

3. FDI declined in Mexico, but remained at high levels

Despite the uncertainty generated by the renegotiation of the North American Free Trade Agreement (NAFTA), transnational corporations continued to invest heavily in Mexico, which was the second largest FDI recipient in the region (with 19.5% of total inflows), which points to the country's high level of integration with global value chains in North America. In the past year, the country received investments totalling US$ 31.726 billion, 8.8% down on 2016 levels, but nonetheless higher than the average for the past 10 years (US$ 29.640 billion).[10] The decline in FDI flows in 2017 was attributable to the drop in

[10] Figures according to the sixth edition of the *Balance of Payments and International Investment Position Manual* (BPM6) of the International Monetary Fund (IMF, 2009).

intercompany loans, which was greater than the rise in equity capital and reinvested earnings (see annex table I.A1.4).

The manufacturing sector continued to attract the largest inflows of capital, accounting for almost half of total investments, although inflows to the sector declined and its share fell from 58.2% of total FDI in 2016 to 45.3% in 2017.[11] The drop was mainly attributable to smaller investments in the chemicals, plastics and beverages sectors, while investments in manufacturing of transport equipment rose from 17.7% in 2016 to 23.5% of the total in 2017. FDI increased in transport and storage, construction and commerce, with the share of these three sectors rising to 10.8%, 10.3% and 9.2% of total FDI, respectively, in 2017.

Investments by United States transnational companies in Mexico increased and were the main source of flows in 2017 (46.8% of the total). Investments from the European Union, on the other hand, decreased, although they still represent almost a third of total FDI (down from 30% in 2016 to 27% in 2017). Investment from Canada grew to 9.1% of the total in 2017, FDI from Australia rose significantly and accounted for 4.9% of the total, while that of China reached record levels at 0.8% (compared with the cumulative 0.1% it had recorded in the 1999–2016 period).

As in 2016, cross-border mergers and acquisitions did not attract major investments in 2017, with no transactions above US$ 1 billion for the year. The most important deals were announced in the energy sector and were completed recently in 2018. The Mexican Government's targets to generate energy based on renewable sources prompted the Canadian fund, Caisse de dépôt et placement du Québec, and the Mexican institutional investors consortium, CKD Infraestructura México, to acquire an 80% stake in a renewable energies portfolio, for a total of US$ 1.35 billion. In another transaction valued at US$ 1.256 billion, the British company Actis acquired energy assets from InterGen, owned by the Ontario Teachers' Pension Plan and China's Huaneng and Guandong Yudean. These assets included a 50% stake in the Sierra Juarez wind farm —the first cross-border wind energy project between Mexico and the United States— as well as six combined-cycle plants and three gas compression stations. The sellers in both transactions are foreign firms, so strictly speaking they do not represent capital inflows to Mexico, although they certainly highlight the interest of transnational companies in the country's energy sector.

The largest transaction of the year took place in the infrastructure sector. Spanish firm Obrascón Huarte Lain S.A. (OHL) acquired an additional 28.34% in its Mexican subsidiary (in which it already held a 58.01% stake) for US$ 749 million. The transaction was completed in partnership with Australia's IFM Global Infrastructure Fund (GIF), a global infrastructure fund with previous experience investing in highways in Mexico, the United States, the United Kingdom and Australia, which has partnered with OHL in the Mexico City ring road *(Circuito Exterior Mexiquense)* since 2015.[12] In a large transaction in the transport sector, United States carrier Delta Air Lines acquired a 32% stake in Aero México (adding to its existing 4% share) for US$ 614 million. Lastly, infrastructure deployment for the digital economy has also become an attractive target for foreign capital. For example, American Tower, from the United States, acquired a tower and fibre-optic network from Mexican company KIO Networks for US$ 500 million, with a view to improving its positioning in 4G networks and in preparation for future deployment of the 5G network.

[11] Data by sector and country of origin are taken from the fifth edition of the *Balance of Payments and International Investment Position Manual* (BPM5) (IMF, 1993). The results may change in the light of subsequent updates of sectoral information in BPM6.

[12] In April 2018, the Australian fund IFM GIF acquired the share that Obrascón Huarte Lain, of Spain, held in OHL Mexico.

Regarding greenfield announcements published in the Financial Times database, fDi Markets, 2017 was a year of significant activity. Announcements grew for the third consecutive year and Mexico occupied first place in the region in terms of amounts invested and number of projects (representing 43% of the total in both categories), overtaking Brazil. In terms of number of projects and levels of investment, the renewable energy, automotive and autoparts, metallurgy and food and beverage sectors recorded the greatest levels of activity.

The tender processes driven by the energy reform led to renewable energy investment announcements estimated at US$ 5 billion, mainly in solar (55% of the total) and wind (34%) energy. Half of this amount came from Italian and Spanish firms, with large investments from Italy's Enel and Spain's Ibedrola, together with inflows from the United Kingdom, Canada, the Netherlands, Saudi Arabia, China and Israel, among others. In all, an unusual diversity of sources for Mexico, where United States companies have typically led foreign investment initiatives.

For the automotive and autoparts industry, investment announcements were estimated at US$ 3.7 billion. These consisted mainly of expansions to existing vehicle manufacturing and autoparts operations in the country, of which Hyundai (Republic of Korea), Paccar, Lear Corporation and Prime Wheel Corporation (United States), JAC (China), and HELLA KGaA Hueck & Co. (Germany), were the most important. Overall, projects from the United States and the Republic of Korea accounted for half of the total, and together with those of Germany, China and Japan, accounted for 90% of total announcements.

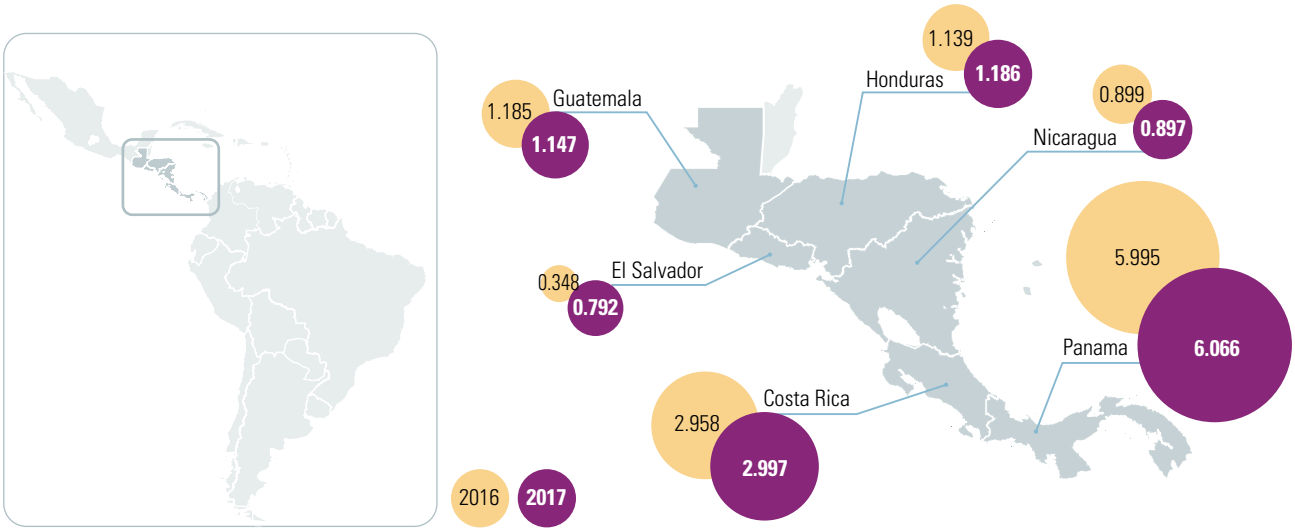
Investments in new projects in the metallurgical industry were estimated at US$ 3 billion. Italian-Argentine group Techint, through its subsidiary Ternium, announced the largest project, consisting of plans to build a new hot-rolling mill in its industrial centre in Pesquería (State of Nuevo León), for a total of US$ 1.14 billion, as well as another investment in galvanizing lines and industrial paint totalling US$ 260 million.

The second largest project announcement of 2017 was in the food and beverage industry, where Grupo Modelo, owned by the Belgium-Brazil holding AB InBev, announced the construction of the brewery Cervecería Modelo del Centro, in Hidalgo, for an estimated US$ 756 million. Similarly, Dutch brewer Heineken and United States group Constellation Brands announced the expansion of their beer operations. In the food market, Granjas Carroll de México, a subsidiary of Switzerland's ECOM Agroindustrial, announced the expansion of its pork production capacity with an investment valued at US$ 550 million.

4. Panama leads FDI inflows to Central America

FDI in Central America continues to rise and, in 2017, reached a record US$ 13.083 billion. Panama is by far the largest recipient of FDI in the subregion, followed by Costa Rica. In 2017, inward FDI remained flat in Guatemala, Honduras and Nicaragua, but increased substantially in El Salvador (see map I.2). Chapter III examines the investments in manufacturing and export services in Central America and the Dominican Republic in greater detail; FDI in the sector was in general higher than in previous years. Continued economic growth, the rise in remittances and the increase in consumption also attracted foreign investment in many services sectors, such as telecommunications. Spanish operator Telefónica announced earlier in the year an investment programme for the subregion aimed at building a large-scale vEPC (virtual Evolved Packet Core) network, a technology that converges voice and data services in 4G networks, estimated at US$ 221 million in each country.

Map I.2
Central America (selected countries): foreign direct investment inflows, 2016 and 2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.

Panama continues to receive increasing FDI inflows, which totalled US$ 6.066 billion in 2017, making the country the seventh largest FDI recipient in Latin America and the Caribbean, close behind Chile. As in previous years, most of these investments were directed at the services sector, particularly logistics and transport operations, trade, and financial services. Transportation and logistics companies continue to take advantage of the country's strategic location for their operations. In 2017, Dubai World announced investments along the channel area estimated at US$ 113 million. FedEx (United States) and Kuehne + Nagel (Switzerland), also announced the expansion of their logistics operations, with investments totalling US$ 84 billion each.

In infrastructure, the Spanish company Acciona announced the construction of wastewater treatment plants, valued at over US$ 300 million, while Telefónica announced investments of US$ 220 million in its telecommunications network. Panama continues to receive investments in renewable energy, notably in the solar energy projects of Italian company Enel, for a value of US$ 55 million.

At the end of 2017, plant construction at the Cobre Panama project, owned by Canadian company First Quantum Minerals, was 70% complete. The company announced a 15% capacity expansion and estimated that total investment throughout the life of the project would reach US$ 6.3 billion, of which US$ 1.256 billion were disbursed in 2017. Production may begin in 2018 (First Quantum Minerals Ltd., 2017).

Costa Rica received US$ 2.997 billion in FDI in 2017, a similar amount to that of 2016. As in the previous year, the manufacturing sector was the largest recipient, at US$ 1.422 billion.[13] Export industries in Costa Rica have developed significantly in recent years, especially the medical equipment and devices segment, which recorded large investments between 2016 and 2017. For example, in the past year, United States group Edwards Lifesciences announced the opening of a manufacturing plant for medical devices, with a US$ 100 million investment (for more details, see chapter III).

Tourism was the second largest recipient of FDI in the country, with inflows totalling US$ 444 million in 2017, the highest level in recent years. In the retail sector, United States company Sysco acquired Mayca for an undisclosed amount. Subsequently, Sysco

[13] Data by sector are published according to the directional principle of the fifth edition of the *Balance of Payments and International Investment Position Manual* (BPM5) (IMF, 1993). See box I.2 for more details.

announced investments in the company for US$ 60 million. Telephone operators also made noteworthy announcements: Claro and Telefónica announced investments of more than US$ 200 million each in 2017 to improve their networks. Costa Rica has also become an important services export hub and in 2017, Amazon —which has operated in the country since 2009— announced the opening of a customer services centre.

Honduras was the recipient of US$ 1.186 billion in FDI, 4.1% up on 2016 levels. As in previous years, 75% of these flows corresponded to reinvested earnings, a higher share than in its neighbouring countries.

The maquila sector (light manufacturing for exports) received US$ 252 million, equivalent to a 50% rise compared with the previous year and the largest annual investment of the past decade, except for 2014. Investments in commerce and in other services declined, but those directed at the electricity sector increased substantially, reaching an unprecedented level of US$ 77 million. With regard to projects announced in 2017, the largest corresponded to Colombian cement firm, Argos, which will expand its capacity in the country by investing up to US$ 100 million; Swiss tobacco company, Davidoff, which will open a plant in Danlí, valued at US$ 121 million; Canadian company, Glen Eagle Resources, which will expand its gold mining capacity through a project valued at US$ 160 million; and United States firm, Texas Armoring Corporation, which announced a US$ 230 million investment to build a vehicle armouring plant.

In 2017, FDI in **Guatemala** totalled US$ 1.147 billion, slightly below 2016 levels, but 17.4% down on 2014 levels. The decline in recent years comes as the high levels of investment prevalent some years ago in the electricity and mining sectors have tapered off. Commerce (US$ 259 million) and manufacturing (US$ 252 million) were the largest recipients of FDI in 2017. In recent years, the latter has received greater inflows than in previous years, although figures are still relatively modest considering the size of the country.

The United States has historically been the largest investor in Guatemala and remained as such in 2017 (total investments of US$ 206 million), but FDI from Latin American countries has grown significantly. Mexico is now the second largest investor (US$ 204 million), followed by Colombia (US$ 82 million) and Peru (US$ 57 million).

FDI flows to **Nicaragua** have remained stable since 2011, at around US$ 900 million. In 2017, inward FDI reached US$ 897 million, half of which was allocated to the industrial sector. Within this sector, foreign investments in export manufacturing —particularly clothing and manufacturing of cable systems (harnesses) for cars— have grown notably (for more information, see chapter III).

There were no new investments in the energy sector, and those in commerce declined compared with the previous year. However, in 2017, United States retailer Walmart announced the opening of three supermarkets and a distribution centre, with investments of around US$ 100 million.

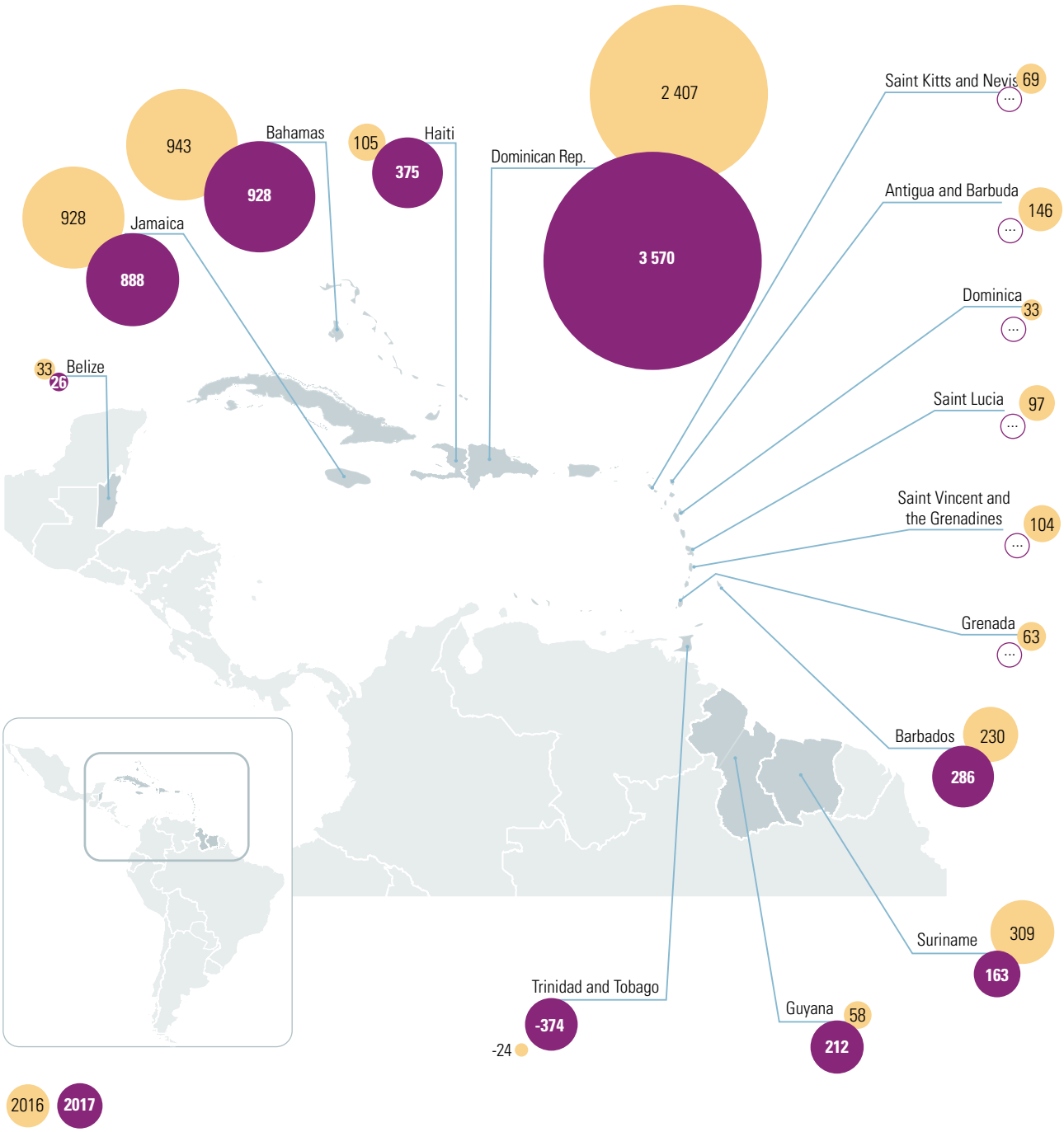
FDI reached record levels in **El Salvador**, as inflows of US$ 792 million more than doubled the figures in recent years and accounted for the highest level of investment since 2008. Once again, manufacturing was the main recipient, with inflows of US$ 414 million that were distributed between the textile and clothing industry, beverages and aircraft repair and maintenance, among others. Commerce was the second largest beneficiary of FDI, with inward investments of US$ 130 million, boosted by the rise in private consumption during 2017. Several foreign companies announced investments in the retail sector: Walmart (United States), LG (Republic of Korea), and Sika (Switzerland) announced US$ 19 million, US$ 36 million and US$ 6 million, respectively.

The electricity sector, for its part, received US$ 98 million, which were allocated to renewable and thermal energy generation projects. Other announcements in this sector were the construction of a wind farm for US$ 110 million by Guatemala's Tracia Networks, and two solar power plants, one by United States firm AES for US$ 47 million and another by French company Neoen for US$ 150 million.

5. Tourism drives FDI in the Caribbean

FDI in the Caribbean subregion grew by 22% in 2017, reaching US$ 6.074 billion. More than half of these flows were directed to the Dominican Republic, followed by the Bahamas (15%) and Jamaica (14%) (see map I.3). Most countries receive foreign investment flows that are significant considering the size of their economies, but that are small in absolute terms. There was no available information on FDI flows to Cuba.

Map I.3
The Caribbean (selected countries): foreign direct investment inflows, 2016 and 2017
(Millions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.

The **Dominican Republic** has been the recipient of record levels of investment in recent years owing to the interest of investors in tourism, manufacturing, export services, the electricity sector and mining. Moreover, economic growth has boosted consumption and attracted investment to all the services sectors of the economy. In 2017, inward FDI stood at US$ 3.57 billion, 48.3% up on levels the previous year and the highest figure on record.

During the year, AB InBev acquired a 30% stake in Cervecería Nacional Dominicana for a total of US$ 927 million. The company, with headquarters in Belgium —but with roots in different parts of the world— had already acquired 55% of the Dominican brewer in 2012. Aside from the commerce and industry sector, in which this transaction took place, tourism was the next largest recipient of FDI in the Dominican Republic, and has received annual inflows of US$ 700 million in the past three years. As in other Caribbean countries, growing tourism demand from the United States has boosted investment in new tourism facilities. The real estate sector, closely linked to tourism, was the next largest recipient with US$ 546 million.

Mining, in which the main foreign operator is Canada's Barrick Gold, was the recipient of US$ 410 million, whereas the firms located in the free-trade zones (both for manufacturing and export services) received FDI totalling US$ 263 million, a record figure for that segment of the economy (see a detailed analysis of these industries in chapter III).

FDI in the **Bahamas** declined slightly in 2017 to US$ 928 million.[14] Tourism is the main sector of the economy and the primary target for FDI. The opening of the Grand Hyatt hotel and casino in 2017 marked the beginning of operations at the Baha Mar megaproject. Baha Mar is a large tourism resort, funded and executed by Chinese firms; Chow Tai Fook Enterprises Limited, of Hong Kong SAR, acquired the facilities in 2016. In the cruise sector, Carnival Corporation announced the construction of a new port for its vessels, for an estimated US$ 100 million.

FDI in **Jamaica** by 4.3% and totalled US$ 888 million, an amount nonetheless higher than the average annual inflow for the 2009–2014 period. Mining and tourism attracted the bulk of investments, with amounts accounting for 25% and 19% of the total, respectively.

The mining sector, attracted US$ 218 million, thus recovering from the steady fall that occurred between 2008 and 2016. The Chinese firm, Jiuquan Iron & Steel Company (JISCO), invested US$ 60 million to reopen the aluminium plant Alpart —acquired from RUSAL in 2016 for US$ 300 million— which had remained closed since 2009. The reopening of facilities created 800 jobs and in December 2017 JISCO delivered the first shipment of aluminium from the Alpart plant (*Jamaica Observer*, 2017a). In addition, the company announced an investment plan for US$ 3 billion aimed at a future expansion.

In 2017, 4.3 million tourists visited the country (a record number) and the sector was the recipient of FDI totalling US$ 173 million. The Mexican hotel and tourism resort chain, Karisma, revealed details of its new luxury resort in Ocho Rios, Sugar Cane Jamaica, valued at US$ 1 billion. The resort will include seven luxury hotels and more than 5,000 rooms, and development will be staggered over the next decade. Excellence Group announced the construction of the Excellence Oyster Bay resort in Montego Bay, to open in June 2018, on the back of an investment of US$ 110 million (*Jamaica Observer*, 2017b).

In the energy sector, the country is seeking to reduce its dependence on oil and to cut electricity prices. United States company New Fortress Energy announced investments for more than US$ 1 billion in the coming years and, in December 2017,

[14] FDI in the Bahamas is the sum of two items on the financial account: direct investment and other private flows.

began the construction of a 94 MW natural gas power plant, with an estimated investment of US$ 265 million for the first phase (*Jamaica Observer*, 2017c). The renewable energy sector has also witnessed high levels of activity. North American group WRB Serra opened a new 20 MW photovoltaic plant, after investments of some US$ 63 million. Similarly, towards the end of 2017, Eight Rivers Energy Co. Ltd. began the construction of a 37 MW photovoltaic plant with a US$ 60 million investment. The plant will be the biggest in the country and aims to offer the lowest prices in the region, at US$ 0.0853 per kilowatt hour (kWh) (*Jamaica Observer*, 2017).

Haiti usually receives relatively modest levels of FDI, but in 2017 inflows more than doubled, reaching US$ 375 million. The increase was mainly attributable to the acquisition of DINASA, the main fuel distributor in the country, by the French company Rubis, for an undisclosed amount. In addition, the clothing sector continues to expand on the back of investments made by Asian companies. In 2016, there were project announcements by WINDS Group (Hong Kong SAR) and MAS Holdings (Sri Lanka), joined in 2017 by those of Everest Textile (Taiwan province of China) and Yangzhou Everbright Foreign Trading (China), with investments estimated at US$ 28 million and US$ 43 million, respectively. The clothing industry in Haiti is favoured by its low cost of labour and privileged access to the United States market (see box III.2).

FDI in **Barbados** reached US$ 286 million in 2017, up 24.6% on the year before. This country also received a record number of tourists and, after several major investment announcements in 2016 (Sandals, Hyatt and Wyndham), several others were announced in 2017 (*Caribbean News Now*, 2018). For example, Nikki Beach opened a new hotel for 200 guests in Port Ferdinand, north of Speightstown, with investments totalling US$ 62 million.

In the digital services sector, the Bahamas-based Cloud services provider, Cloud Carib, announced the expansion of its services in Barbados, as well as the opening of new facilities throughout the Caribbean and Latin America, supported by an investment plan for the region estimated at US$ 220 million.

FDI in **Guyana** increased from US$ 58 million in 2016 to US$ 212 million in 2017, a similar level to that received during the first half of the 2010 decade. Energy and mining were the two main recipients, at 41% and 23% of the total, respectively. FDI grew in all sectors, except in manufacturing. The energy sector received US$ 90 million, as part of a first wave of inward FDI related to ExxonMobil's discovery of major oil reserves off Guyana's coast. While it continues with its successful exploration efforts, ExxonMobil decided to launch the first development phase of the Liza field, with an investment of US$ 4.4 billion; the group aims to begin extraction in 2020 (ExxonMobil, 2017). The Government of Guyana hopes to take advantage of the international interest in the recently discovered oil reserves to promote other sectors, such as agriculture and mining (Demerara Waves, 2017). In the latter, Canadian mining company First Bauxite Corporation (FBX) announced a bauxite production project valued at US$ 50 million, with construction of facilities set to begin in 2018 (Aluminium Insider, 2017).

In 2017, FDI flows to **Suriname** totalled US$ 163 million, a 47.2% drop compared with inflows in 2016.

Natural resources are the main driver of the country's development. Gold is the most important export product, so the discovery in Saramacca by Canadian company IAMGOLD has generated expectations of future investments. In the oil sector, the Government signed a production-sharing agreement with United States firms ExxonMobil and Hess, and another with Norway's Statoil, to develop two blocks off the coast of the country, in the same basin where Exxon found oil in Guyana.

FDI in **Belize** dropped for a third consecutive year, to US$ 26 million, its lowest level since 2003. The rise in reinvested earnings (65.6%) was unable to offset the decline in equity capital inflows. The construction industry and the real estate sector were the main recipients of FDI, while the tourism industry —with 400,000 visitors per year— plays a key role in the economy. The first Hilton hotel was inaugurated in 2017 and United States chain Wyndham announced the opening of its first tourist resort in 2018.

Inward FDI to **Trinidad and Tobago** was negative by US$ 374 million in 2017. The petroleum sector accounts for almost 35% of GDP and the lion's share of the country's foreign investment; however, in recent years inflows to the sector have been trending downwards because of low oil prices and the maturity of its oilfields. In 2017, however, some major announcements were made. After announcing a US$ 5 billion investment over the next five years, BP received the go-ahead for its new Angelin gas project (World Oil, 2017). Shell acquired the totality of the gas portfolio owned by Centrica and located off the country's coast, for US$ 30 million, and Royal Dutch Shell bought Chevron's assets in Trinidad and Tobago, for a total of US$ 250 million.

The countries that make up the **Organization of Eastern Caribbean States** (Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Vincent and the Grenadines and Saint Lucia) have not published data on FDI from 2017 as of the date of this report. In 2016, the group was the recipient of US$ 513 million. Tourism is the driving force of these economies and the area that attracts much of foreign direct investment. Furthermore, all of these countries, except Saint Vincent and the Grenadines, have established citizenship by investment programmes, in which foreigners are offered citizenship in exchange for investing in a national fund or in specific Government-approved projects. In practice, this lowers the cost of capital for many major projects, including those developed in the tourism sector.

Saint Vincent and the Grenadines inaugurated its new international airport in 2017, with an estimated value of US$ 259 million. Air Caribbean, Air Canada and American Airlines have already established direct connections with several North American cities, which should stimulate the growth of tourism in the island.

Saint Lucia continues to develop its tourism sector. Following the announcement by Sandals in 2016, in 2017 the Hilton hotel chain announced the opening of its first hotel, with approximately 500 rooms, while Royalton Saint Lucia Resort and Spa announced another investment, of US$ 250 million, which would create another 800 jobs. In addition, the Chinese company Desert Star Holdings announced the development in the south of the island of a mega resort, Pearl of the Caribbean, valued at US$ 2.6 billion. The project, given its large scale, has proven controversial due to the environmental impact foreseen.

Tourism is key for the development of **Grenada**. Kimpton Hotels & Restaurants plans to open its second project in the Caribbean —a 146-room hotel— in early 2019, while Silversands also announced the opening of its hotel on the island. In 2017, the citizenship for investment programme recorded the greatest level of activity since its launch in 2014, with investments totalling more than US$ 130 million.

Tourism projects also led FDI activity in **Saint Kitts and Nevis**. Hyatt opened its first Park Hyatt hotel in the Caribbean, while Wyndham Hotel Group announced a project valued at US$ 160 million in Nevis. In addition, construction on the 350-room Seaview Gardens Hotel Project began in 2017, with a planned investment of US$ 120 million.

Antigua and Barbuda was hit hard by hurricane Irma in September 2017. The World Bank estimated damages of around US$ 222 million, which would account for 9% of the country's GDP. However, tourism continues to develop. For example, Waldorf

Astoria Hotels and Resorts, Hilton's luxury brand, opened its first resort in the Caribbean in Antigua. In addition, the Tourism Authority of Antigua and Barbuda announced new investments totalling approximately US$ 90 million in infrastructure for cruise ships (Travel Daily Media, 2017).

In 2017, Hurricane Maria devastated **Dominica**, causing damages estimated at US$ 1.3 billion, more than twice the country's GDP (World Bank, 2017). The disaster struck only two years after Hurricane Erika, the damages of which were estimated at 90% of the country's GDP. In this context, FDI and the citizenship by investment programme will be key for reconstruction efforts. In the tourism sector, Marriott's Autograph Collection hotel has been included in the country's citizenship by investment programme.

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Annex I.A1

Table I.A1.1
Latin America and the Caribbean: inward foreign direct investment by country, 2003–2017[a]
(Millions of dollars)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Antigua and Barbuda	179	95	238	361	341	161	85	101	68	138	101	155	154	146	...
Argentina	1 652	4 125	5 265	5 537	6 473	9 726	4 017	11 333	10 840	15 324	9 822	5 065	11 759	3 260	11 517
Bahamas	713	804	1 054	1 492	1 623	1 512	646	1 097	1 409	1 034	1 133	3 244	408	943	928
Barbados	185	228	390	342	476	615	255	446	458	548	56	559	69	230	286
Belize	-11	111	127	109	143	170	109	97	95	189	95	153	65	33	26
Bolivia (Plurinational State of)	197	85	-288	281	366	513	423	643	859	1 060	1 750	657	555	335	725
Brazil	10 123	18 161	15 460	19 418	44 579	50 716	31 481	88 452	101 158	86 607	69 686	97 180	74 718	78 248	70 685
Chile	4 026	6 797	7 462	7 586	13 475	18 473	13 855	16 020	24 150	30 293	20 825	23 736	21 051	12 374	6 419
Colombia	1 720	3 116	10 235	6 751	8 886	10 564	8 035	6 430	14 647	15 039	16 209	16 167	11 723	13 850	13 924
Costa Rica	575	794	861	1 469	1 896	2 078	1 615	1 907	2 733	2 696	3 205	3 242	2 956	2 958	2 997
Dominica	32	27	32	29	48	57	58	43	35	59	25	35	36	33	...
Dominican Republic	613	909	1 123	1 085	1 667	2 870	2 165	2 024	2 277	3 142	1 991	2 209	2 205	2 407	3 570
Ecuador	872	837	493	271	194	1 057	309	166	644	567	727	772	1 322	755	606
El Salvador	123	366	398	267	1 455	824	366	-226	218	466	179	306	396	348	792
Grenada	91	66	73	96	172	141	104	64	45	34	114	38	61	63	0
Guatemala	263	296	508	592	745	754	600	806	1 026	1 245	1 295	1 389	1 221	1 185	1 147
Guyana	26	30	77	102	152	178	164	198	247	294	214	255	122	58	212
Haiti	14	6	26	161	75	29	55	178	119	156	161	99	106	105	375
Honduras	403	547	600	669	928	1 006	509	969	1 014	1 059	1 060	1 417	1 204	1 139	1 186
Jamaica	721	602	682	882	866	1 437	541	228	218	413	545	582	925	928	888
Mexico	18 225	24 916	26 018	20 663	33 070	32 188	19 455	20 990	24 320	17 570	47 229	30 287	36 519	34 776	31 726
Nicaragua	201	250	241	287	382	627	434	490	936	768	816	884	950	899	897
Panama	771	1 012	1 027	2 498	1 777	2 402	1 259	2 363	3 132	2 980	3 943	4 459	5 058	5 995	6 066
Paraguay	25	28	36	114	202	263	71	462	581	697	245	412	306	320	356
Peru	1 335	1 599	2 579	3 467	5 491	6 924	6 431	8 455	7 341	11 788	9 800	4 441	8 272	6 863	6 769
Saint Kitts and Nevis	78	63	104	115	141	184	136	119	112	110	139	120	78	69	...
Saint Lucia	112	81	82	238	277	166	152	127	100	78	95	93	95	97	...
Saint Vincent and the Grenadines	55	66	41	110	121	159	111	97	86	115	160	110	121	104	...
Suriname	-76	-37	28	-163	-247	-231	-93	-248	70	174	188	164	279	309	163
Trinidad and Tobago	808	998	940	883	830	2 801	709	549	41	-1 904	-1 130	661	194	-24	-374
Uruguay	416	332	847	1 493	1 329	2 106	1 529	2 289	2 504	6 044	755	3 830	2 435	-379	27
Venezuela (Bolivarian Republic of)[b]	2 040	1 483	2 589	-508	3 288	2 627	-983	1 574	5 740	5 973	2 680	320	1 383	...	...
Total	**46 508**	**68 794**	**79 350**	**76 696**	**131 223**	**153 095**	**94 601**	**168 242**	**207 225**	**204 754**	**194 111**	**203 043**	**186 743**	**168 426**	**161 911**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.

[a] The data are compiled according to the methodology of the fifth edition of the *Balance of Payments and International Investment Position Manual* (BPM5) of the International Monetary Fund (IMF), except in the cases of Brazil, Chile, Colombia, Costa Rica, El Salvador and Jamaica, whose data are compiled according to the new methodology contained in the sixth edition of the *Balance of Payments and International Investment Position Manual* (BPM6) of IMF. The BPM6 methodology is also used in part of the series for the following countries: Dominican Republic (from 2006 to 2017), Guatemala (from 2008 to 2017), Mexico (from 2006 to 2017), Nicaragua (from 2006 to 2017), Trinidad and Tobago (from 2011 to 2017) and Uruguay (from 2012 to 2017). For more information on the methodological change, see table I.2.

[b] The data for 2015 refer to the first three quarters only.

Table I.A1.2

Latin America and the Caribbean: inward foreign direct investment by destination sector, 2008–2017
(Millions of dollars)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Argentina[a]										
Natural resources	2 556	2 654	4 284	4 132	2 543	1 255	1 536	408	605	...
Manufactures	4 186	2 084	2 635	3 550	3 566	4 064	3 465	4 466	1 873	...
Services	3 907	3 009	4 670	6 125	5 120	5 198	5 075	5 583	3 500	...
Belize										
Natural resources	37	7	13	29	100	22	10	12	22	10
Manufactures	0	0	0	0	0	0	0	0	0	0
Services	117	93	79	59	90	64	113	40	5	8
Other	16	9	5	5	6	9	9	13	6	7
Bolivia (Plurinational State of)[b]										
Natural resources	859	420	531	622	1 166	1 550	1 558	916	372	638
Manufactures	154	74	276	240	119	317	390	23	137	260
Services	290	193	128	171	220	162	173	227	592	323
Brazil[c]										
Natural resources	11 210	4 288	20 251	8 895	10 136	17 180	9 428	5 965	10 139	5 696
Manufactures	9 763	9 952	25 862	33 550	37 550	39 323	42 425	33 801	36 639	30 497
Services	9 091	5 667	7 250	28 580	27 528	23 873	34 545	27 668	22 178	28 853
Chile										
Natural resources	4 599	6 181	4 933	14 705	15 383	2 583	2 809	6 862	1 521	...
Manufactures	1 570	57	1 704	-39	1 034	1 950	1 352	17	6	...
Services	8 725	7 859	8 537	10 898	10 366	15 200	16 476	6 799	6 330	...
Other	256	-131	979	-1 190	3 778	1 360	3 375	6 791	4 368	...
Colombia										
Natural resources	5 176	5 672	4 976	7 336	7 970	8 385	6 516	3 363	2 559	4 653
Manufactures	1 696	1 364	210	1 214	1 985	2 481	2 967	2 661	1 839	2 269
Services	3 693	1 000	1 244	6 098	5 084	5 344	6 685	5 711	9 451	7 596
Costa Rica										
Natural resources	71	78	-3	-19	20	2	13	403	94	40
Manufactures	431	373	980	887	399	329	614	622	1 253	1 422
Services	1 696	875	530	1 548	1 847	2 392	2 271	1 726	1 179	1 543
Other	122	118	176	45	-8	19	27	1	15	2
Dominican Republic										
Natural resources	357	758	240	1 060	1 169	93	-39	6	486	410
Manufactures	574	280	566	355	1 257	404	607	368	413	1 365
Services	1 938	1 128	1 218	862	716	1 494	1 640	1 831	1 508	1 795
Ecuador										
Natural resources	265	58	189	380	243	274	724	628	504	189
Manufactures	198	118	120	122	136	138	108	264	37	143
Services	594	133	-143	142	189	315	-60	431	213	274

Table I.A1.2 (concluded)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
El Salvador										
Natural resources	31	9	1	-1	-3	6	1	1	1	1
Manufactures	28	92	-65	149	-49	285	83	290	267	421
Services	479	243	-225	66	490	-147	245	77	81	312
Other (maquila)	365	21	0	0	0	0	0	0	0	0
Guatemala										
Natural resources	174	139	120	325	418	335	201	156	28	61
Manufactures	175	51	299	150	145	186	179	205	261	252
Services	369	401	363	544	636	707	951	759	739	716
Other	36	9	23	7	46	67	58	101	157	118
Honduras										
Natural resources	4	10	84	62	41	70	72	64	-94	32
Manufactures	267	98	341	392	438	325	667	385	430	457
Services	736	402	545	560	579	665	678	755	803	697
Other	0	0	0	0	0	0	0	0	0	0
Mexico										
Natural resources	4 604	1 531	1 502	995	3 221	5 797	2 619	1 648	1 241	1 136
Manufactures	9 132	7 231	14 304	11 252	9 557	31 433	17 222	17 007	17 316	13 544
Services	15 695	9 390	11 517	13 015	8 989	11 271	8 884	16 278	11 228	15 667
Nicaragua										
Natural resources	57	47	77	191	123	272	109	32	-12	...
Manufactures	122	70	108	226	302	234	246	280	378	...
Services	447	318	323	550	347	350	378	501	392	...
Other	0	0	0	0	22	125	151	137	141	...
Panama										
Natural resources	-59	-34	77	94	1 164	468	27	327	251	...
Manufactures	161	104	-114	298	520	142	250	116	159	...
Services	2 106	1 190	2 760	2 761	1 526	2 957	4 182	4 052	4 816	...
Paraguay										
Natural resources	7	7	-1	20	34	45	83	-25	...	...
Manufactures	201	-33	302	210	409	-30	-12	100	...	...
Services	55	98	160	351	254	237	311	185	...	...
Uruguay										
Natural resources	604	253	329	383	435	358	53	52	177	...
Manufactures	261	242	131	190	566	501	669	159	-777	...
Services	1 003	962	1 010	1 360	1 042	2 578	1 548	686	-144	...
Other	238	71	820	572	199	24	58	23	-48	...
Total										
Natural resources	30 552	22 076	37 603	39 209	44 163	38 695	25 720	20 818	17 894	12 866
Manufactures	28 917	22 156	47 660	52 746	57 936	82 080	71 234	60 764	60 232	50 629
Services	50 942	32 959	39 967	73 691	65 023	72 658	84 096	73 307	62 871	57 783
Other	1 032	98	2 004	-561	4 043	1 604	3 680	7 066	4 639	127

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.
[a] Data from the Central Bank of the Argentine Republic.
[b] Gross foreign direct investment flows, excluding divestments.
[c] Data do not include reinvested earnings.

Table I.A1.3
Latin America and the Caribbean: inward foreign direct investment by country of origin, 2007–2017
(Millions of dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Argentina[a]											
Spain	2 191	812	1 248	1 166	217	2 835	2 354	-2 323	3 310	1 275	...
Panama	592	1 153	107	476	840	3 170	2 345	2 629	1 621	477	...
Venezuela (Bolivarian Republic of)	103	372	664	48	-8	450	1 249	722	329	332	...
Bermuda	200	116	515	730	273	403	369	336	65	151	...
Chile	560	862	245	1 080	1 085	1 255	590	838	929	120	...
Samoa	229	256	-107	368	167	-65	-79	18	276	95	...
Mexico	549	545	123	309	407	611	-94	312	381	68	...
Germany	385	342	317	578	221	525	927	749	528	62	...
Bolivia (Plurinational State of)[b]											
Peru	35	26	40	82	12	56	101	442	-5	247	...
France	13	36	22	89	55	73	220	200	185	207	...
Spain	50	25	145	271	235	364	676	537	369	161	...
United States	322	295	162	85	79	89	61	140	79	101	...
Switzerland	-29	12	-7	34	2	12	7	4	5	58	...
Brazil[c]											
Netherlands	8 129	4 639	6 515	2 762	18 693	15 365	23 614	24 591	23 513	23 506	14 740
United States	6 073	7 047	4 902	7 180	4 531	20 926	10 715	11 530	10 162	8 616	14 597
Luxembourg	2 857	5 937	537	9 174	2 472	7 771	9 737	8 679	6 936	9 841	5 399
France	1 233	2 880	2 141	3 007	4 352	2 827	2 981	3 947	-477	3 352	4 656
Germany	1 801	1 086	2 473	604	1 322	1 200	1 983	2 670	3 877	1 930	4 392
Italy	313	385	232	225	519	1 006	960	976	1 833	2 825	1 688
Mexico	409	220	167	1 840	892	2 808	5 376	1 462	443	704	1 555
Bahamas	603	1 101	52	-7	-178	64	801	514	384	634	1 534
Chile											
Brazil	0	0	80	1 066	421	1 225	119	-40	688	3 523	...
Spain	0	0	2 776	1	2 500	-1 236	975	1 603	631	1 815	...
Italy	0	0	318	425	126	-138	-573	191	408	1 224	...
Japan	0	0	1 019	752	821	877	1 091	459	981	982	...
Canada	0	0	638	907	2 444	4 538	4 379	3 088	-2 223	556	...
Colombia											
Spain	572	1 040	830	113	1 164	628	884	2 214	1 324	1 463	2 616
United States	2 697	2 874	2 343	1 593	2 154	2 476	2 838	2 240	2 135	2 098	2 122
Mexico	390	573	-464	-296	455	849	556	663	-130	789	1 717
Panama	839	1 141	789	1 368	3 508	2 395	2 040	2 436	1 650	1 433	1 464
United Kingdom	1 580	1 505	1 400	949	1 408	1 357	1 400	1 088	718	879	1 282
Switzerland	122	140	166	180	994	698	2 096	2 804	958	731	1 027

Table I.A1.3 (continued)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Costa Rica											
United States	657	1 179	976	1 009	1 385	562	402	685	1 277	836	1 651
Switzerland	39	86	-38	79	5	44	90	143	-31	59	286
Colombia	37	126	6	115	155	132	97	94	119	215	179
Netherlands	274	19	24	4	37	206	223	329	492	379	179
Mexico	78	106	5	47	193	339	95	285	128	128	104
Spain	31	58	73	33	276	267	70	179	90	120	97
Dominican Republic											
United States	536	360	455	1 055	499	252	374	321	405	356	732
Canada	113	383	773	696	1 126	851	143	158	91	480	473
Spain	605	181	151	203	137	128	33	7	32	281	206
Dinamarca	2	8	8	9	-2	4	1	0	4	32	63
Italy	32	11	16	8	16	1	0	10	-1	48	32
Ecuador											
China	85	47	56	45	80	86	94	79	114	58	85
Spain	85	190	51	-17	52	50	71	67	71	102	80
Uruguay	2	-37	-13	40	3	6	115	62	43	0	61
Chile	12	5	19	7	16	16	24	18	78	14	45
Netherlands	8	-8	-4	11	7	11	48	76	293	382	40
United States	50	-29	-607	-535	12	94	42	10	186	88	35
El Salvador											
Panama	841	321	80	206	27	-514	236	12	120	226	267
Honduras	0	0	0	-4	0	23	-1	8	-14	46	157
Luxembourg	0	0	0	-309	-41	85	42	157	-188	5	89
Guatemala											
United States	326	229	151	343	127	227	221	441	385	349	209
Mexico	76	76	50	97	81	96	143	105	60	186	204
Colombia	3	15	21	22	155	48	155	142	164	124	160
Peru	10	0	0	12	5	5	15	15	-4	-11	82
Spain	43	66	64	50	2	49	74	43	62	68	57
Luxembourg	37	37	21	6	0	0	25	39	47	52	56
Israel	22	39	0	1	-15	1	10	38	17	32	43
Honduras											
Panama	22	16	1	14	16	22	63	152	232	273	237
United States	460	449	92	185	141	173	128	-256	140	1	202
Mexico	15	44	14	61	44	52	37	88	60	158	114
Colombia	0	0	0	0	20	22	31	128	97	99	104
Guatemala	18	3	12	19	29	32	-5	7	45	153	100
Luxembourg	0	0	171	133	149	124	150	133	92	108	91

Table I.A1.3 (concluded)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Mexico											
United States	16 242	12 023	8 945	10 978	13 019	9 621	16 943	9 596	18 999	10 916	13 939
Spain	4 562	5 285	2 745	3 992	3 519	-373	427	4 495	3 507	2 979	3 201
Canada	1 690	4 848	2 143	2 107	1 542	1 769	4 856	2 902	1 134	2 174	2 710
Germany	737	716	237	640	786	1 112	1 961	2 035	1 247	2 592	2 289
Japan	673	815	760	1 310	1 093	2 349	2 146	2 277	2 050	1 778	1 657
Australia	139	11	16	42	22	24	59	21	686	98	1 461
Italy	131	167	79	161	288	579	-291	268	659	800	1 262
Nicaragua											
United States	84	126	88	88	159	121	244	...	...	...	...
Mexico	128	164	48	90	115	149	125	...	...	...	...
Venezuela (Bolivarian Republic of)	47	132	147	29	45	210	108	...	...	...	...
Panama	5	4	1	1	34	78	77	...	...	...	...
Spain	45	59	25	33	116	-19	74	...	...	...	...
Panama											
United States	163	224	-19	1 120	652	28	715	2 154	1 204	1 740	...
Colombia	134	60	135	82	486	9	29	1 162	772	978	...
Canada	18	35	16	9	48	1 097	505	29	45	268	...
Ecuador	9	20	-4	9	13	533	305	638	202	233	...
Taiwan Province of China	28	126	15	130	114	1	3	-487	115	228	...
Netherlands	22	420	0	126	-114	244	-2	109	344	201	...
United Kingdom	208	6	68	114	486	-701	78	101	268	176	...
Paraguay											
United States	107	216	35	332	240	86	-98	-169	83	117	...
Luxembourg	69	43	29	-32	90	-17	-8	26	-60	62	...
Guatemala	0	0	0	0	29	0	2	46	115	50	...
United Kingdom	1	3	3	6	30	52	29	63	26	35	...
Spain	19	16	24	35	22	94	19	-58	-36	32	...
Trinidad and Tobago											
United States	574	403	469	363	488	560	1 272	361	...	...	...
India	21	16	17	13	2	1	2	348	...	...	...
Canada	3	2 194	4	3	994	1 586	357	248	...	...	...
United Kingdom	159	146	152	118	64	25	21	31	...	...	...
Uruguay											
Brazil	86	183	110	108	170	331	515	-249	541	788	...
Spain	153	232	55	75	194	204	429	1 042	-30	533	...
Luxembourg	3	4	12	10	-4	-752	32	-127	141	280	...
Bermuda	0	7	223	-59	0	-55	-143	-331	-274	232	...
Argentina	373	534	432	588	809	243	293	-262	47	202	...
Singapur	0	0	0	0	0	58	104	-79	240	104	...

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.

[a] Data from the Central Bank of the Argentine Republic.

[b] Gross foreign direct investment flows, excluding divestments.

[c] Data do not include reinvested earnings.

Table I.A1.4
Latin America and the Caribbean: inward foreign direct investment by component, 2007–2017
(Millions of dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Antigua and Barbuda											
Capital contributions	328	149	79	96	61	110	65	106	143	135	...
Intercompany loans	0	0	1	1	2	6	29	41	3	3	...
Reinvested earnings	12	12	5	5	5	22	7	7	7	8	...
Argentina											
Capital contributions	2 540	4 945	2 740	3 055	5 116	6 360	3 784	1 056	2 998	4 389	2 778
Intercompany loans	1 846	4 777	-1 010	3 507	2 600	3 120	-783	-945	2 382	-4 732	2 422
Reinvested earnings	2 088	3	2 287	4 771	3 124	5 843	6 821	4 954	6 378	3 603	6 316
Bahamas											
Capital contributions	887	1 032	753	960	971	575	410	310	104	194	120
Intercompany loans	736	481	-107	137	438	458	723	2 934	304	749	808
Reinvested earnings	0	0	0	0	0	0	0	0	0	0	0
Barbados											
Capital contributions	420	340	140	393	227	230	118	307	398	275	326
Intercompany loans	24	231	103	41	324	113	-119	-76	-216	-136	-143
Reinvested earnings	32	45	13	13	-93	206	56	329	-112	91	102
Belize											
Capital contributions	100	141	80	80	103	193	101	145	57	19	3
Intercompany loans	13	8	6	2	1	0	0	0	0	0	0
Reinvested earnings	30	21	23	15	-8	-4	-6	7	7	14	22
Bolivia (Plurinational State of)[a]											
Capital contributions	27	45	1	1	5	19	17	313	20	406	152
Intercompany loans	654	850	177	141	130	282	331	889	741	568	415
Reinvested earnings	272	407	509	793	899	1 204	1 682	919	405	127	654
Brazil											
Capital contributions	26 074	30 064	19 906	40 117	54 782	52 836	42 152	47 501	49 520	44 965	53 959
Intercompany loans	18 505	20 652	11 575	13 470	16 451	22 541	38 346	38 981	18 053	24 146	11 547
Reinvested earnings	0	0	0	34 865	29 925	11 230	-10 813	10 698	7 145	9 137	5 179
Chile											
Capital contributions	2 622	7 775	1 905	4 662	10 921	8 532	4 806	10 524	6 494	6 150	1 932
Intercompany loans	661	1 869	763	3 318	3 155	10 949	8 598	8 807	10 633	2 695	-1 432
Reinvested earnings	10 192	8 829	11 187	8 040	10 073	10 811	7 421	4 406	3 924	3 528	5 919
Colombia											
Capital contributions	7 024	7 861	4 907	3 741	8 282	9 091	9 755	9 181	7 360	6 461	7 910
Intercompany loans	-121	47	731	-635	1 872	1 239	2 368	2 493	2 006	4 675	1 971
Reinvested earnings	1 983	2 657	2 396	3 325	4 493	4 710	4 086	4 494	2 357	2 713	4 043

Table I.A1.4 (continued)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Costa Rica											
Capital contributions	1 377	1 594	1 050	818	959	852	1 704	1 352	1 180	414	1 032
Intercompany loans	-2	39	-174	150	711	1 136	714	912	665	1 153	376
Reinvested earnings	521	446	471	497	509	708	788	978	1 110	1 391	1 590
Dominica											
Capital contributions	28	39	39	28	25	45	16	28	29	26	…
Intercompany loans	9	9	13	13	7	9	4	4	4	4	…
Reinvested earnings	10	9	6	3	2	4	5	4	4	4	…
Dominican Republic											
Capital contributions	1 616	2 199	704	667	804	1 256	233	955	995	1 126	2 402
Intercompany loans	-446	278	1 096	554	468	904	471	-166	18	66	-162
Reinvested earnings	498	394	365	803	1 005	982	1 286	1 420	1 192	1 214	1 331
Ecuador											
Capital contributions	151	229	278	265	252	227	424	848	985	679	521
Intercompany loans	-368	530	-225	-312	64	40	-7	-390	51	-124	-75
Reinvested earnings	411	298	256	213	328	301	310	314	287	200	161
Grenada											
Capital contributions	140	128	97	56	39	29	109	33	55	58	…
Intercompany loans	17	1	2	3	1	0	0	0	0	0	…
Reinvested earnings	15	12	5	5	5	5	5	5	6	6	…
Guatemala											
Capital contributions	260	679	581	908	969	1 025	880	958	712	146	29
Intercompany loans	-30	75	19	-102	58	219	416	431	-452	50	156
Reinvested earnings	515	482	488	643	770	580	672	820	961	989	961
Honduras											
Capital contributions	220	568	84	29	284	310	174	248	137	201	156
Intercompany loans	203	-40	65	378	56	52	240	253	229	-42	135
Reinvested earnings	505	479	360	562	674	697	645	917	838	981	895
Mexico											
Capital contributions	18 102	13 015	11 345	15 890	9 574	4 694	22 454	6 011	13 656	11 052	11 582
Intercompany loans	6 458	9 876	2 779	-132	4 129	2 558	7 235	7 911	11 161	14 338	10 528
Reinvested earnings	8 510	9 297	5 332	5 232	10 618	10 319	17 540	16 365	11 702	9 386	9 617
Panama											
Capital contributions	719	918	898	948	759	1 561	1 614	687	77	807	650
Intercompany loans	178	136	105	540	1 224	682	550	343	1 599	1 735	1 825
Reinvested earnings	879	1 348	257	874	1 150	737	1 779	3 429	3 382	3 453	3 591
Paraguay											
Capital contributions	43	66	152	93	399	421	333	693	363	250	241
Intercompany loans	129	73	-58	149	316	40	-321	-460	-22	-51	-50
Reinvested earnings	31	124	-23	220	-134	236	233	180	-34	121	164

Table I.A1.4 (concluded)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Peru											
Capital contributions	733	2 981	1 828	2 445	896	5 393	2 490	-1 786	4 170	2 213	1 984
Intercompany loans	924	656	-782	693	2 117	-508	3 202	2 705	1 105	477	-727
Reinvested earnings	3 835	3 287	5 385	5 317	4 328	6 903	4 107	3 522	2 997	4 172	5 513
Saint Kitts and Nevis											
Capital contributions	135	178	132	116	107	106	137	118	76	67	...
Intercompany loans	3	3	1	1	1	2	0	0	1	1	...
Reinvested earnings	2	2	2	2	4	1	1	1	2	2	...
Saint Lucia											
Capital contributions	254	135	135	109	80	54	76	71	72	74	...
Intercompany loans	8	21	13	13	15	16	10	11	12	12	...
Reinvested earnings	15	11	3	4	5	8	9	11	11	12	...
Saint Vincent and the Grenadines											
Capital contributions	102	142	100	91	79	112	157	101	118	101	...
Intercompany loans	8	8	8	2	2	2	2	2	2	3	...
Reinvested earnings	11	9	2	4	4	1	1	7	1	1	...
Suriname											
Capital contributions	0	0	0	0	0	0	0	0	...	...	...
Intercompany loans	-247	-231	-93	-248	-51	113	71	-21	...	...	...
Reinvested earnings	...	...	...	0	121	11	69	27	...	...	...
Trinidad and Tobago											
Capital contributions	554	2 322	426	309	517	-251	-1 899	518	...	...	...
Intercompany loans	-21	-16	-12	-11	-476	-1 653	769	143	...	...	...
Reinvested earnings	297	495	296	251	0	0	0	0	...	...	...
Uruguay											
Capital contributions	550	1 012	990	1 617	1 412	1 163	1 712	1 689	1 380	1 166	799
Intercompany loans	448	540	82	8	263	2 473	-1 503	1 581	2 430	-922	-830
Reinvested earnings	331	554	457	664	828	2 408	547	561	-1 374	-623	58
Venezuela (Bolivarian Republic of)											
Capital contributions	-806	302	-3 348	-1 319	-495	-307	-79	139	...	...	...
Intercompany loans	773	-11	367	1 457	2 752	3 292	1 784	-967	...	...	...
Reinvested earnings	3 321	2 336	1 998	1 436	3 483	2 988	975	1 148	...	...	...
Total											
Capital contributions	64 201	78 858	46 000	76 173	97 127	94 637	91 744	82 103	91 097	81 373	87 204
Intercompany loans	30 361	40 859	15 443	23 138	36 629	48 085	63 130	65 417	50 710	44 669	26 752
Reinvested earnings	34 317	31 555	32 081	68 558	72 120	60 911	38 227	55 522	41 194	40 527	45 839

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.
[a] Gross foreign direct investment flows, excluding divestments.

Table I.A1.5
Latin America and the Caribbean: inward foreign direct investment stock by country, 2001–2017
(Millions of dollars and percentages of GDP)

	2001	2005	2012	2013	2014	2015	2016	2017	2001	2005	2012	2013	2014	2015	2016	2017
Argentina	79 504	55 139	98 706	88 338	89 716	79 773	70 855	76 576	27	27	17	14	16	12	13	11
Bolivia (Plurinational State of)	5 893	4 905	8 809	10 558	11 785	11 598	11 604	12 305	72	51	33	34	36	35	34	33
Brazil	121 949	181 344	731 175	724 781	725 872	568 226	703 328	778 287	22	20	30	29	30	32	39	38
Chile	...	79 138	210 593	218 846	229 972	238 919	256 777	282 339	...	63	79	79	88	98	103	102
Colombia	15 377	36 987	112 924	128 190	141 786	149 163	164 511	180 235	16	25	31	34	37	51	59	58
Costa Rica	3 600	7 510	22 302	26 271	30 046	33 539	36 962	40 430	23	38	48	53	59	61	65	70
Dominican Republic	...	...	24 200	26 108	28 306	30 558	32 953	36 502	...	...	40	42	43	44	46	48
Ecuador	6 876	9 861	13 069	13 796	14 568	15 891	16 646	17 253	28	24	15	15	14	16	17	17
El Salvador	2 252	4 167	8 763	8 895	9 314	9 995	10 178	10 279	19	28	41	40	41	43	43	41
Guatemala	...	3 319	8 938	10 255	11 977	13 189	14 603	16 199	...	12	18	19	20	21	21	21
Haiti	99	150	900	1 061	1 160	1 265	1 370	1 745	3	4	12	13	13	15	18	20
Honduras	1 585	2 870	9 024	10 084	11 501	12 704	13 844	15 029	21	29	50	55	60	62	66	65
Jamaica	3 931	6 918	12 119	12 664	13 246	14 171	14 961	...	43	62	82	89	95	99	107	...
Mexico	156 583	211 235	521 440	553 149	551 876	563 671	536 617	553 608	21	24	43	43	42	48	50	48
Nicaragua	1 565	2 461	6 385	7 200	8 084	9 034	9 933	10 830	29	39	61	66	68	71	75	79
Panama	7 314	10 167	26 762	30 677	35 135	39 629	44 839	50 174	59	62	67	67	70	73	78	81
Paraguay	1 016	1 127	4 957	4 979	5 707	4 652	5 115	5 471	13	13	20	17	18	17	19	19
Peru	11 835	15 889	62 105	71 905	76 346	84 618	91 480	98 243	23	21	32	36	38	45	48	46
Suriname	...	...	1 035	1 232	1 397	1 477	...	...	...	...	21	24	27	31	...	...
Uruguay	2 406	2 844	40 969	40 845	44 981	45 433	44 443	44 837	12	16	80	71	79	85	84	76
Venezuela (Bolivarian Republic of)	39 074	44 518	40 180	33 018	30 139	...	...	...	32	31	11	9	6	...	...	...
Total	**460 857**	**680 548**	**1 965 355**	**2 022 850**	**2 072 913**	**1 927 505**	**2 081 020**	**2 230 342**	**23**	**26**	**33**	**33**	**33**	**39**	**44**	**42**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.

Table I.A1.6
Latin America and the Caribbean: outward foreign direct investment by country, 2001–2017[a]
(Millions of dollars)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Antigua and Barbuda	14	13	15	17	2	2	2	4	5	3	4	6	6	6	6	...
Argentina	-627	774	676	1 311	2 439	1 504	1 391	712	965	1 488	1 055	890	1 921	875	1 787	1 156
Bahamas	40	72	169	143	333	459	410	217	150	524	158	277	2 679	170	359	132
Barbados	25	25	54	157	44	82	73	27	343	558	41	39	-213	141	-10	-28
Belize	0	0	0	1	1	1	3	0	1	1	1	1	3	0	2	1
Bolivia (Plurinational State of)	3	3	3	3	3	4	5	-4	-29	0	77	-255	-33	-2	89	80
Brazil	2 479	229	9 822	2 910	28 798	17 061	26 115	-4 552	26 763	16 067	5 208	14 942	26 040	13 518	12 816	6 268
Chile	0	1 709	2 145	2 135	2 212	4 852	9 151	7 233	9 461	20 252	20 556	9 888	12 800	16 025	7 465	4 824
Colombia	857	938	192	4 796	1 268	1 279	3 085	3 505	5 483	8 420	-606	7 652	3 899	4 218	4 517	3 690
Costa Rica	132	152	206	150	219	430	197	274	318	405	894	804	424	414	495	149
Dominica	1	0	1	13	3	7	0	1	1	0	0	2	2	2	2	...
El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grenada	3	1	1	3	6	16	6	1	3	3	3	1	1	1	1	...
Guatemala	0	0	0	0	0	0	16	26	24	17	39	34	106	117	117	180
Honduras	7	12	-6	1	1	2	-1	4	-1	2	208	68	103	252	239	173
Jamaica	74	116	52	101	85	115	76	61	58	75	24	73	0	4	226	47
Mexico	891	1 253	4 432	6 474	5 337	10 307	3 194	11 164	8 039	12 331	18 701	13 458	6 965	12 252	6 595	6 116
Paraguay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peru	0	60	0	0	0	66	736	411	266	147	78	137	801	127	303	262
Saint Kitts and Nevis	1	2	7	11	4	6	6	5	3	2	2	2	2	2	3	...
Saint Lucia	5	5	5	4	4	6	5	6	5	4	4	3	3	3	3	...
Saint Vincent and the Grenadines	0	0	0	1	1	2	0	1	0	0	0	0	0	0	0	...
Suriname	0	0	0	0	0	0	0	0	0	3	-1	0	0	0	0	...
Trinidad and Tobago	106	225	25	341	370	0	700	0	0	67	189	63	-18	153	83	106
Uruguay	-14	-15	-18	-36	1	-89	11	-16	60	7	3 869	-2 034	1 319	1 605	449	259
Venezuela (Bolivarian Republic of)[b]	1 026	1 318	619	1 167	1 524	-495	1 311	2 630	2 492	-370	4 294	752	1 024	...	...	...
Total	**5 022**	**6 894**	**18 402**	**19 701**	**42 655**	**35 616**	**46 492**	**21 709**	**54 408**	**60 006**	**54 797**	**46 803**	**57 833**	**49 884**	**35 544**	**23 416**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 6 June 2018.

[a] The data are compiled according to the methodology of the fifth edition of the Balance of Payments and International Investment Position Manual (BPM5) of the International Monetary Fund (IMF), except in the cases of Brazil, Chile, Colombia, Costa Rica, El Salvador and Jamaica, whose data are compiled according to the new methodology contained in the sixth edition of the Balance of Payments and International Investment Position Manual (BPM6) of IMF. The BPM6 methodology is also used in part of the series for the following countries: Dominican Republic (from 2006 to 2017), Guatemala (from 2008 to 2017), Mexico (from 2006 to 2017), Nicaragua (from 2006 to 2017), Trinidad and Tobago (from 2011 to 2017) and Uruguay (from 2012 to 2017). For more information on the methodological change, see table I.2.

[b] The data for 2015 refer to the first three quarters only.

CHAPTER

II

Foreign direct investment dominates Mexico's advanced manufacturing sectors

II

A. Mexico: a winner in the fragmentation of international production systems?

In recent years, the fragmentation of production processes and the international dispersion of tasks and activities have accelerated, especially in the manufacturing sector (WTO, 2017). About 60% of global trade consists of trade in intermediate goods and services that are incorporated at various stages in the production process of goods and services for final consumption (UNCTAD, 2013a). Gradually, large companies have transferred different stages of production outside their countries of origin, establishing an extensive regional or global network of their own subsidiaries and independent suppliers. These changes in the organization of global production were driven by falling costs of international trade, chiefly transportation, the progressive and widespread liberalization of trade policies and the rapid development and expansion of information and communication technologies (WIPO, 2017).

Global value chains therefore became increasingly important in channelling and coordinating global production, trade and investment (OECD, 2013), becoming a defining element of contemporary globalization (Gereffi and Lee, 2012). While global value chains were not a new feature in the global economic landscape, early in the first decade of the twenty-first century they suddenly grew in size, scale and complexity. Currently, global value chains currently account for around 80% of global trade (UNCTAD, 2013b).

Global value chains also lead to significant distortions in the measurement of international trade, as it is possible for intermediate goods to be counted several times. According to some estimates, between 24% and 28% of gross exports consist of value added that is first imported by countries only to be incorporated into products or services that are then exported again[1] (UNCTAD, 2013a and OECD, 2013). Trade growth in global value chains has therefore led to a steady reduction in export value added worldwide (WIPO, 2017) (see figure II.1).

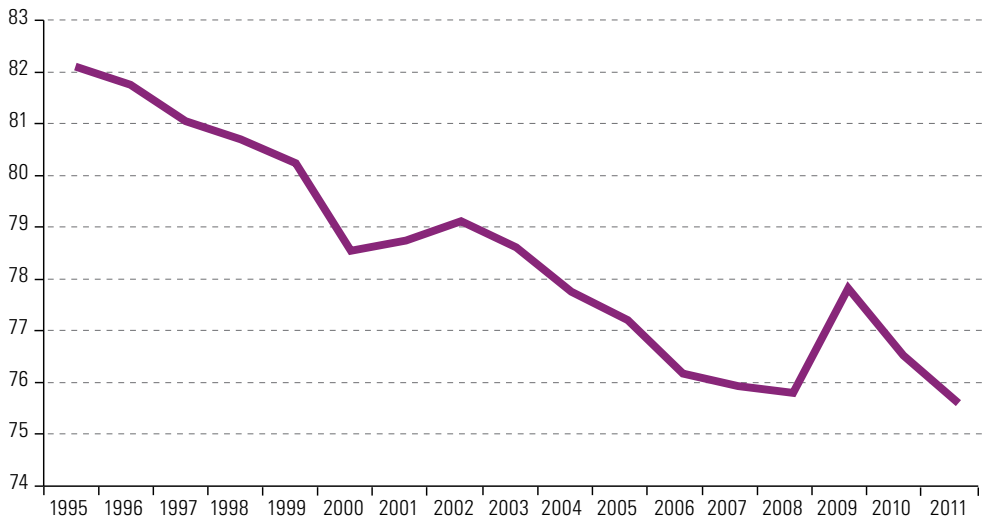


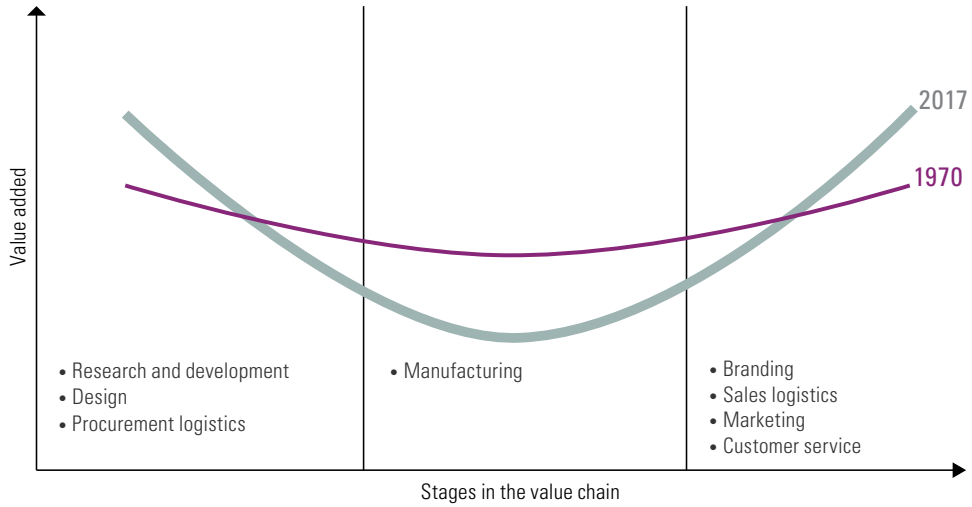
Figure II.1
Export value added worldwide, 1995–2011
(Percentage of total exports)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from Organization for Economic Cooperation and Development (OECD), Trade in Value Added (TiVA), December 2016 [online database] https://stats.oecd.org/index.aspx?queryid=75537#.

[1] At country level, foreign value added in exports measures the extent to which the gross domestic product contribution of trade is absorbed by other countries upstream in the value chain, or the extent to which a country's exports are dependent on imported content. It is also an indication of the level of vertical specialization of economies: the extent to which economic activities in a country focus on particular tasks and activities in global value chains (UNCTAD, 2013a).

Global value chains have expanded widely in the automotive, electronics, garment and other industries. In global value chains, increasing importance is being assigned to the pre- and post-manufacturing stages, which account for an increasing percentage of the total value of production (see figure II.2). To differing degrees, developing countries have increased their participation in global value chains, especially those with a marked regional character, and in less complex activities in these chains. Advanced countries and some emerging economies closely connected with global value chains have begun to depend increasingly on imported content for their exports.

Figure II.2
Production in the twenty-first century: a growing smile



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from World Intellectual Property Organization (WIPO), *World Intellectual Property Report 2017: Intangible Capital in Global Value Chains*, Geneva 2017 [online] http://www.wipo.int/edocs/pubdocs/en/wipo_pub_944_2017.pdf.

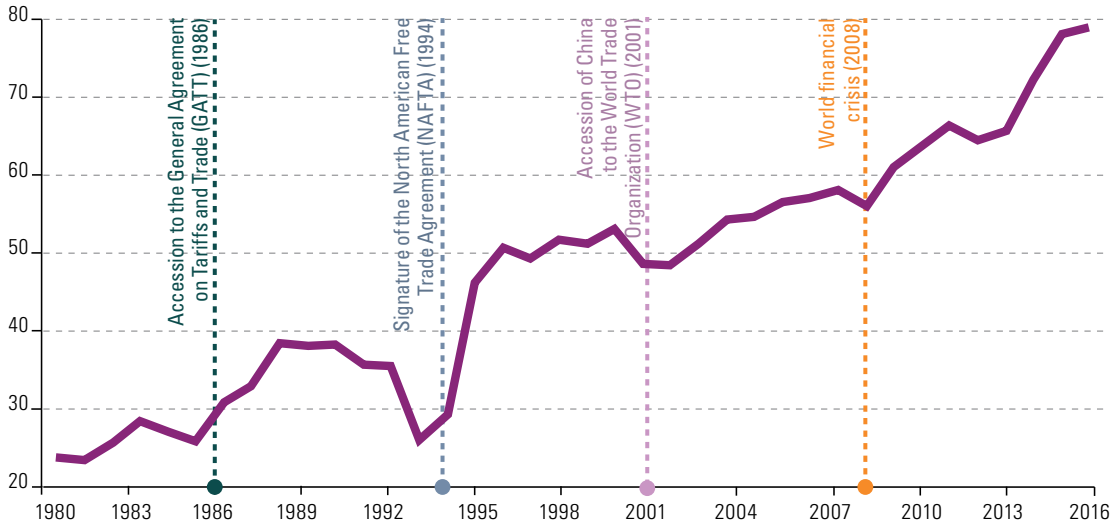
The strongest linkages within supply chains are found in North America, East Asia and the European Union (Kowalski and others, 2015). The most developed economies in each of these blocks (the United States, Japan and Germany, respectively) produce and export technology-intensive intermediate goods and services to middle-income countries (low-cost export platforms), which then export assembled products to various destinations, both inside and outside their economic area. This makes it more important to strengthen endogenous factors of production, such as knowledge-based capital and quality infrastructure. China's recent success in increasing its participation in more technology- and knowledge-intensive stages of production is a case in point.

Even though Latin America's participation has been lower than that of other developing regions (Blyde, 2014), the nature and scope of participation in global value chains are far from uniform across the region (Cadestin, Gourdon and Kowalski, 2016). Mexico is an exception in this regard, as it specializes in processing and exporting both inputs and final products and is an important part of some of North America's main supply chains.

Mexico's current export orientation and its strong linkages with regional global value chains spring from programmes for industrial development and job creation on the northern border, the so-called maquiladora industry. In stylized terms, several generations of this type of productive enterprise can be identified (Carrillo and Hualde, 1996): the first is manual labour-intensive and based on simple assembly; the second is based on the rationalization of work, manufacturing and new technology adoption; the third is based on knowledge intensification and on research, development and design activities. The fourth and final generation, associated with the automotive and electronics industries, is based on the establishment of regional corporations (Lara and Carrillo, 2003). While these generations of enterprises have emerged at different stages in Mexico's industrialization, they remain to this day.

After joining the General Agreement on Tariffs and Trade (GATT), in the mid-1980s Mexico embarked on a process of trade liberalization which, coupled with restructuring of production in the maquiladora industry, boosted exports (see figure II.3). The country quickly switched its export profile from natural resources (67% of exports in 1980) to manufactured goods (80% in 1993). In the 1990s, the automotive industry and the electrical machinery and electronic equipment industry became very important, with foreign companies playing the biggest role.

Figure II.3
Mexico: relative importance of trade,[a] 1980–2017
(Percentage of gross domestic product)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the World Bank [online] https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS.

[a] This a trade liberalization index that measures total trade (the sum of exports and imports) as a share of gross domestic product.

Mexico's signature of the North American Free Trade Agreement (NAFTA) helped to consolidate the external sector-based development model, by speeding up growth in foreign trade, increasing the value added of the maquiladora industry and promoting new inward foreign direct investment (FDI), particularly to the northern border.

During this period, clusters were established comprising technical centres, assembly plants, component suppliers, indirect suppliers (such as machine or plastic injection shops) and service providers. As a result of NAFTA rules of origin, production chains were strengthened by the arrival of Asian suppliers. In addition, technology catch-up initiatives, greater decision-making autonomy by local subsidiaries and closer links between the education sector and firms began to be seen (Dutrenit and Vera-Cruz, 2002; Carrillo, 1993; Bair and Gereffi, 2001).

With the start of the new millennium, the outlook for Mexico's export sector became more complex because of three factors: (i) the economic crisis in the United States, the main destination for its products; (ii) the end of the NAFTA grace period and a change in regulations for the maquiladora industry; (iii) the emergence of fierce competition from China and India by virtue of low wage costs, government support and subsidies, a large pool of labour and a huge potential market. After joining the World Trade Organization (WTO) in 2001, China became the main competitor for

Mexico's maquiladora industry, which lost major market share in virtually all sectors, except the automotive industry (Gereffi, 2018).

Many labour-intensive businesses (first-generation maquiladoras), including garment manufacturers, either closed their operations or relocated them to such areas as Central America or Asia (Christman, 2005). However, new activities emerged or were consolidated in which some companies managed to catch up with the latest technology and to build stronger competitive advantages. This was the case with the automotive, electronics, aerospace and medical equipment industries (Carrillo, 2010).

In 2007, the decree regulating the maquiladora industry expired and a new stimulus programme was announced that was extended to include all export companies (Secretariat of Economic Affairs of Mexico, 2010).[2] However, this coincided with the onset of the global financial crisis, which severely depressed external demand for cars and electronic goods, especially in the United States. There was a steep decline in production and employment in several manufacturing industries, which led to closures, layoffs and plant relocation.

To cope with the crisis, the Mexican authorities continued to create favourable conditions for attracting and retaining FDI, including tax cuts and worker training programmes, in order to encourage the creation of clusters around assembly companies and their suppliers (Álvarez and Carrillo, 2017).

In recent years, there has been a strong recovery in Mexican production, even overtaking that of its NAFTA trading partners, on the back of a fast-growing manufacturing sector and an increasing contribution by high and medium-high research and development (R&D)-intensive activities (see figure II.4). The manufacturing industry currently contributes just over one third of the economy's output (36%) and 18% of its value added. The most buoyant export sectors continue to grow. Between 1993 and 2017, Mexico's exports increased nearly eight-fold —from US$ 52 billion to US$ 409 billion— making it the thirteenth biggest exporter in the world and far and away the top exporter in Latin America and the Caribbean.

Exports not only grew in volume, composition and complexity, they also underwent major changes. Between 1990 and 2017, the share in total exports of the most sophisticated products, such as machinery and transport equipment, increased from 25% to 62% (see figure II.5). In 2016, Mexico ranked twenty-first in terms of economic complexity, above countries like Spain, Canada and the Russian Federation (Harvard University, 2018).

This increased complexity in the manufacturing sector has been driven by a sharp rise in imports, particularly of intermediate inputs. In 2017, intermediate goods comprised 77% of imports, a key factor in the widespread deployment of global value chains in Mexico (see figure II.6). This has been fostered by Mexico's extensive network of free trade agreements (Secretariat of Economic Affairs of Mexico, 2018a), enabling it to access intermediate inputs at competitive prices.[3]

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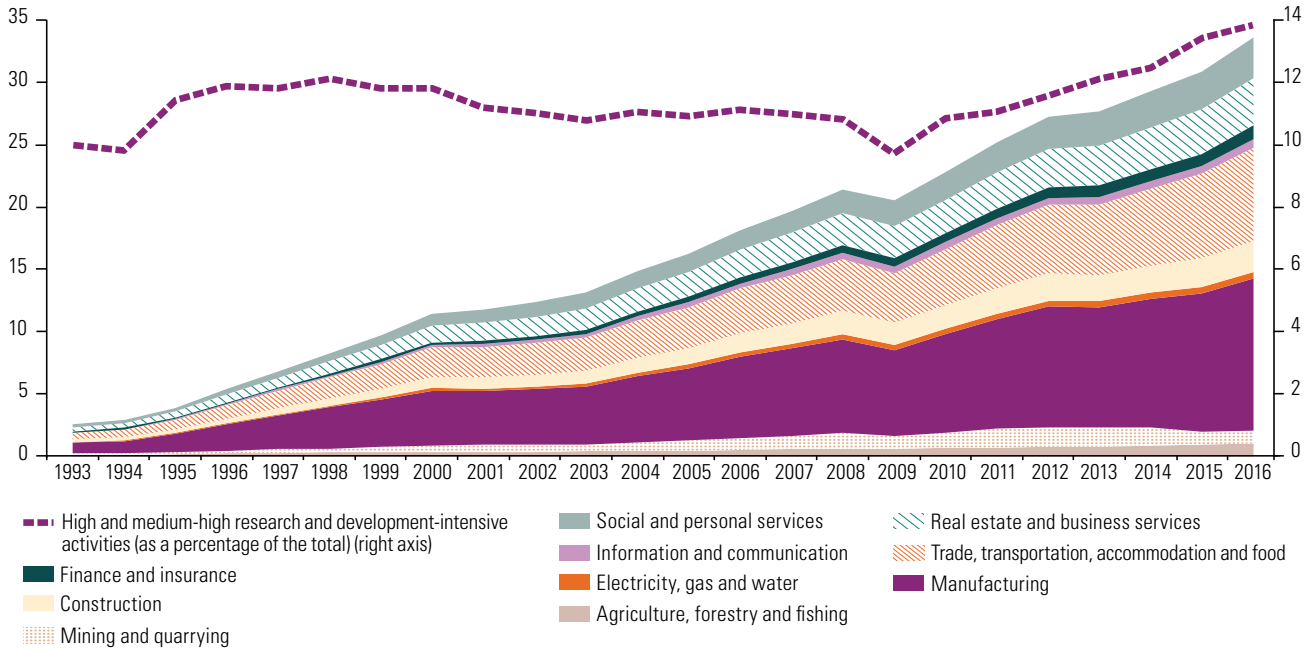
2 In 2007, the manufacturing, maquiladora and service export industry (IMMEX) was established by federal government decree.

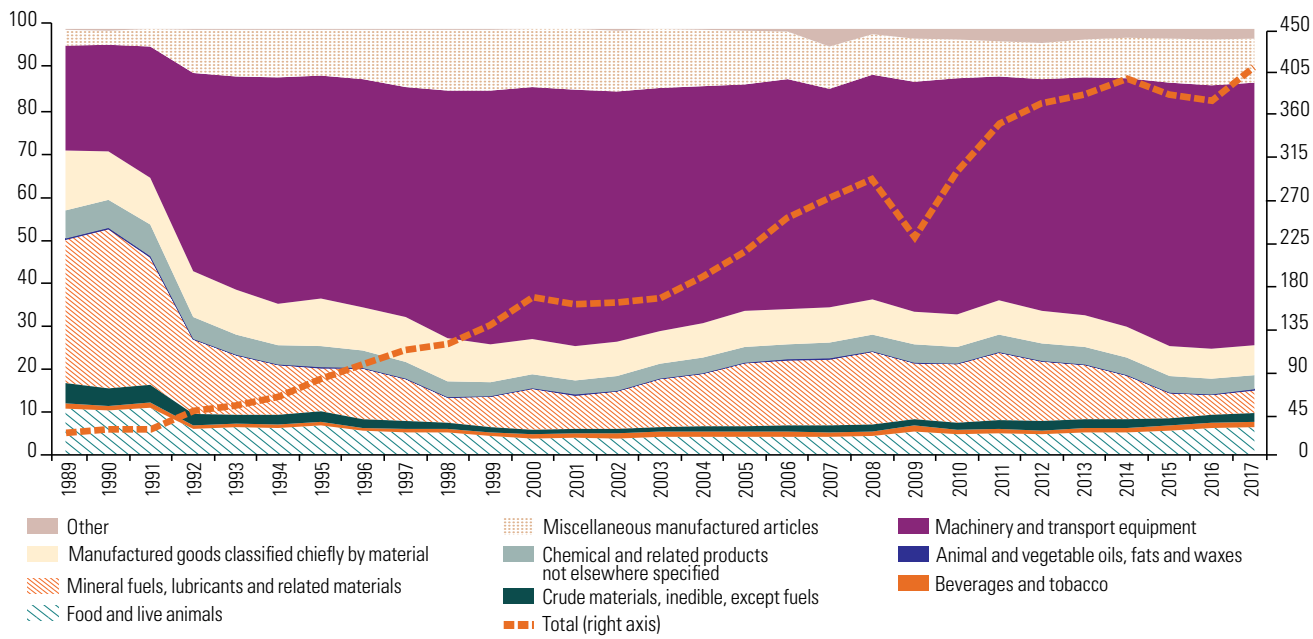
3 Mexico currently has 12 free trade agreements with 46 countries, 32 agreements on the reciprocal promotion and protection of investments with 33 countries and 9 partial-scope agreements within the framework of the Latin American Integration Association (ALADI). In March 2018, Mexico, together with 10 other countries, also signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), also known as TPP11.

Figure II.4
Mexico: production, by economic activity, 1993–2016
(Trillions of nominal Mexican pesos and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from Organization for Economic Cooperation and Development (OECD), STAN Industrial Analysis [online] https://stats.oecd.org/Index.aspx?DataSetCode=STANI4_2016.

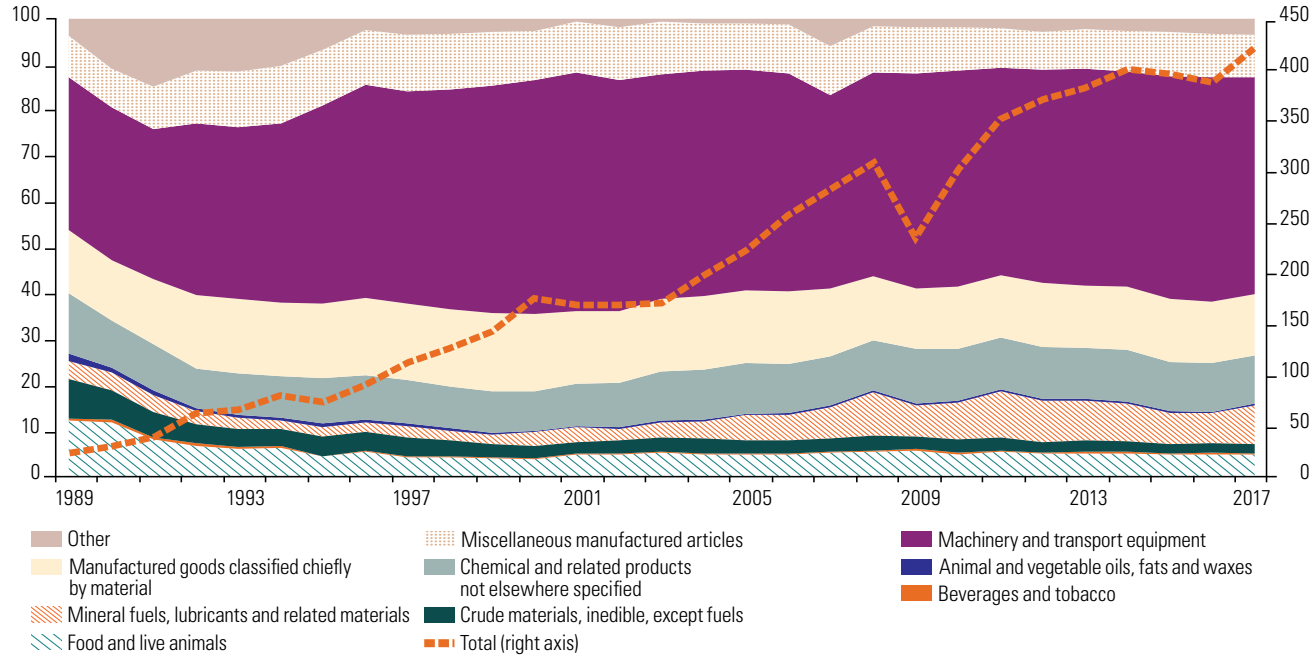
Figure II.5
Mexico: total exports, by economic activity, according to the Standard International Trade Classification (SITC) Revision 3, 1989–2017
(Percentages and billions of dollars)



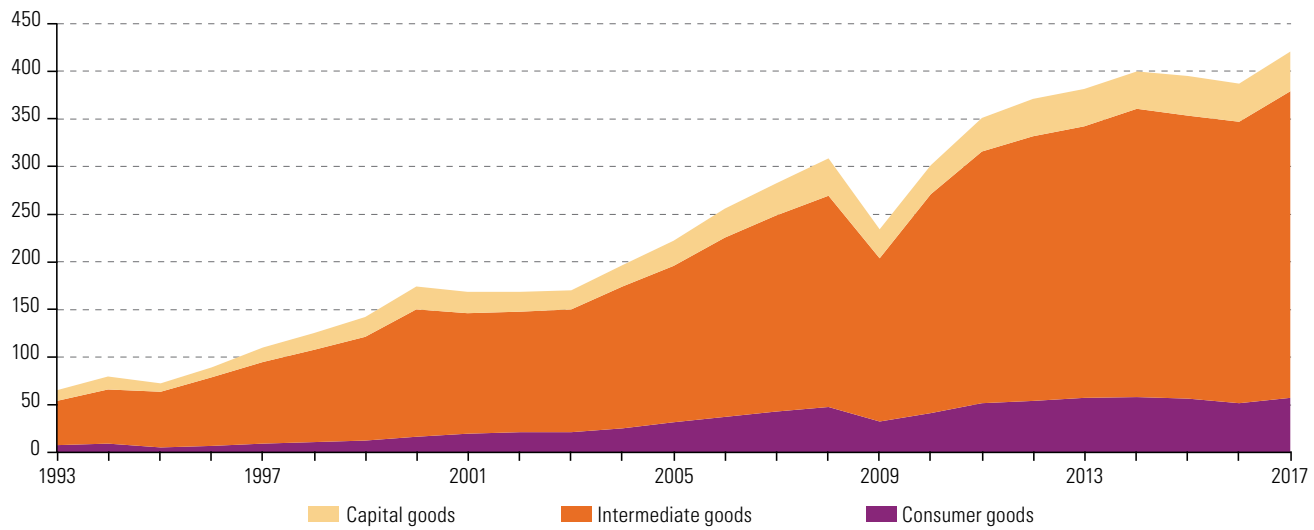
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

Figure II.6
Mexico: total imports, 1989–2017

A. By economic activity, according to the Standard International Trade Classification (SITC) Revision 3
(percentages and billions of dollars)



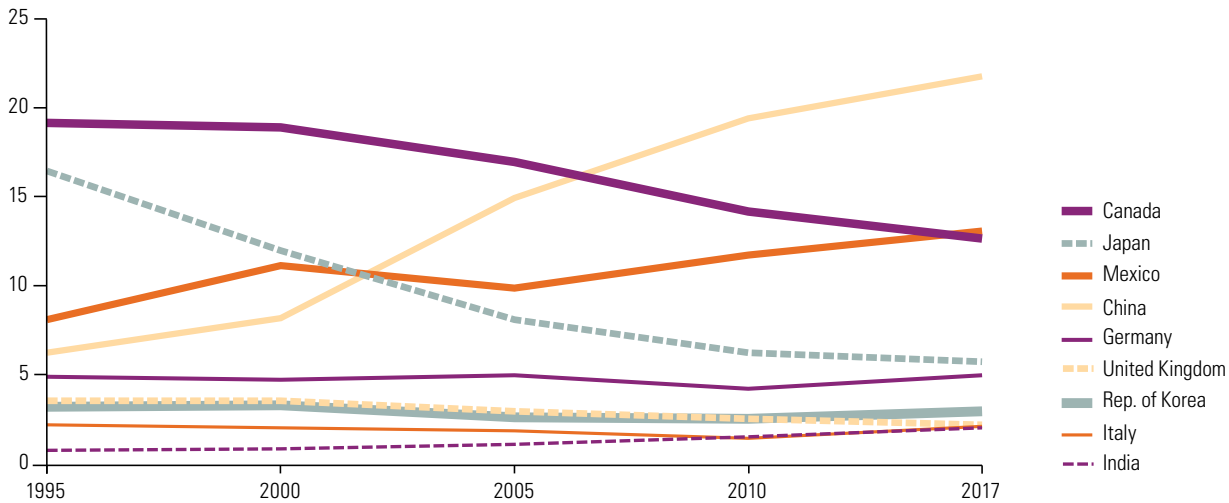
B. By type of product
(billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE) and Bank of Mexico.

However, from an export perspective, these enabling conditions for accessing imported inputs from multiple markets have not been symmetrical. Over the past two decades, Mexico has maintained a high degree of concentration in the United States market. In 2017, the United States was the destination for 80% of Mexican exports. Nevertheless, Mexico is the only country, apart from China, to have increased its share of the United States import market, particularly in the wake of the 2008 global financial crisis (see figure II.7).

Figure II.7
United States: market share by country of origin of imports, 1995–2017
(Percentages)

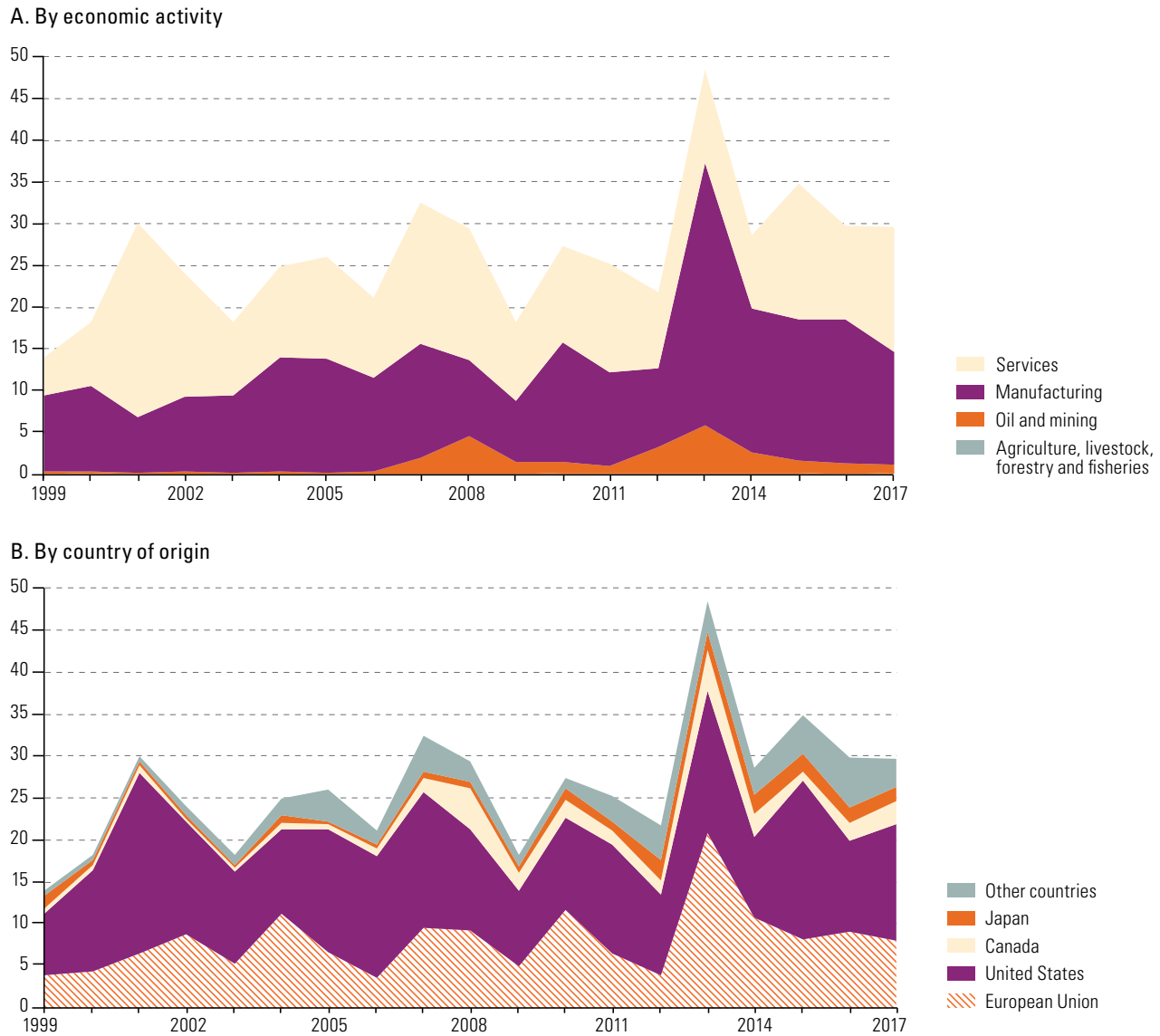


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

With trade liberalization and the consolidation of NAFTA, FDI inflows increased significantly. Between the first and second half of the 1990s, inflows of FDI more than doubled to an annual average of close to US$ 12.9 billion. Between 2000 and 2017, these capital inflows amounted to an annual average of US$ 27.133 billion making Mexico one of the main FDI recipients in Latin America and the Caribbean, along with Brazil and Chile.

Over the past 20 years, Mexico has received FDI worth more than US$ 530 billion, nearly half of which was allocated to the manufacturing sector (48.6%), mainly for the manufacture of transport equipment (13% of the total) and electronic goods (6%) (see figure II.8A). Through FDI and trade flows, NAFTA therefore evolved rapidly from a process of economic integration based on political agreements into one of de facto production integration, in which regional global value chains, led by transnational companies, became a key element. The other NAFTA partners —the United States (49%) and Canada (7%)— have become the main source of Mexico's FDI (Secretariat of Economic Affairs of Mexico, 2018b), deploying active offshoring strategies to take advantage of favourable trade treatment, geographical proximity and lower operating costs. Over time, the advantages granted by Mexico under NAFTA have also become instrumental in the relocation of transnational companies from other countries, such as Japan, the Republic of Korea and Germany (see figure II.8B).

Figure II.8
Mexico: foreign direct investment, 1999–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the Secretariat of Economic Affairs of Mexico.

The structural change brought about by trade liberalization positioned the country as one of the world's top manufacturing economies. In 2016, Mexico ranked eighth among the world's 40 most competitive manufacturing countries and it could well have risen to seventh place by 2020 (Deloitte, 2016). By the end of this decade, Mexico is expected to enjoy a privileged position alongside the main emerging economies (China, India and Republic of Korea) and the leading advanced economies (United States, Germany and Japan) (see table II.1). Although this performance stems from accumulated production capacity in the manufacturing activities spearheading the export drive, it has also exacerbated the disparities between sectors, regions and firms.

Table II.1
Global manufacturing competitiveness index rankings by country, 2010–2020

	2010	2013	2016	2020
1	China	China	China	United States
2	India	Germany	United States	China
3	Republic of Korea	United States	Germany	Germany
4	United States	India	Japan	Japan
5	Brazil	Republic of Korea	Republic of Korea	India
6	Japan	Taiwan Province of China	United Kingdom	Republic of Korea
7	Mexico	Canada	Taiwan Province of China	Mexico
8	Germany	Brazil	Mexico	United Kingdom
9	Singapore	Singapore	Canada	Taiwan Province of China
10	Poland	Japan	Singapore	Canada

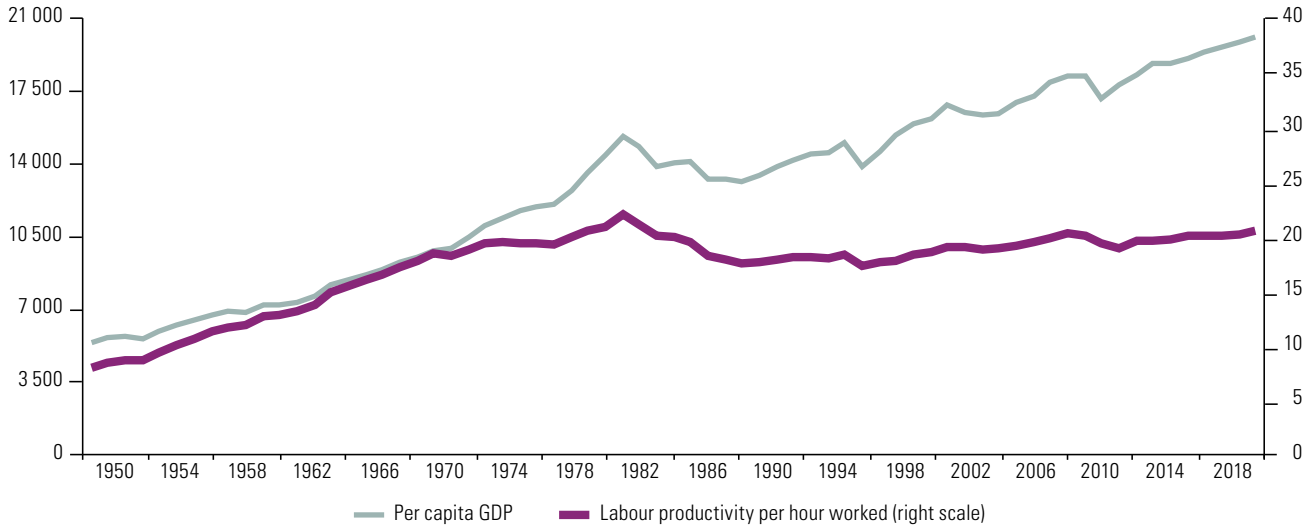
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from Deloitte, *2010 Global Manufacturing Competitiveness Index*, London, 2010 [online] https://www2.deloitte.com/content/dam/Deloitte/us/Documents/manufacturing/us-mfg-2010-global-manufacturing-competitiveness-index.pdf]; *2013 Global Manufacturing Competitiveness Index*, London, 2013 [online] https://www2.deloitte.com/za/en/pages/manufacturing/articles/2013-global-manufacturing-competitiveness-index.html]; and *2016 Global Manufacturing Competitiveness Index*, London, 2016 [online] https://www2.deloitte.com/global/en/pages/manufacturing/articles/global-manufacturing-competitiveness-index.html.

In Mexico, industries that are coordinated and integrated into global value chain rationale and dynamics exist alongside activities that create little value added and are a long way from the world technology frontier (Pérez, Lara and Gómez, 2017). Gradually, the latter have lost competitiveness and revealed multiple problems and rigidities in such areas as financing, innovation, infrastructure, production linkages and transaction costs. In contrast, the dynamic sectors show greater competitiveness and high growth rates, which have enabled them to increase their contribution to gross domestic product (GDP) and job creation. For most manufactured goods, their performance has also been better in terms of workforce skills and wages, technology use and development, propensity for innovation and productivity, as well as closer linkages with other sectors. Despite these advances, Mexico's labour productivity tends to be very low and the trend has not been particularly positive. Although it has risen slightly since signing NAFTA (essentially driven by the modern sectors), in real terms, labour productivity per hour worked has still not returned to the 1981 level (see figure II.9A). So, while other countries with a major manufacturing base are increasing their labour productivity, Mexico's has remained stagnant (see figure II.9B).

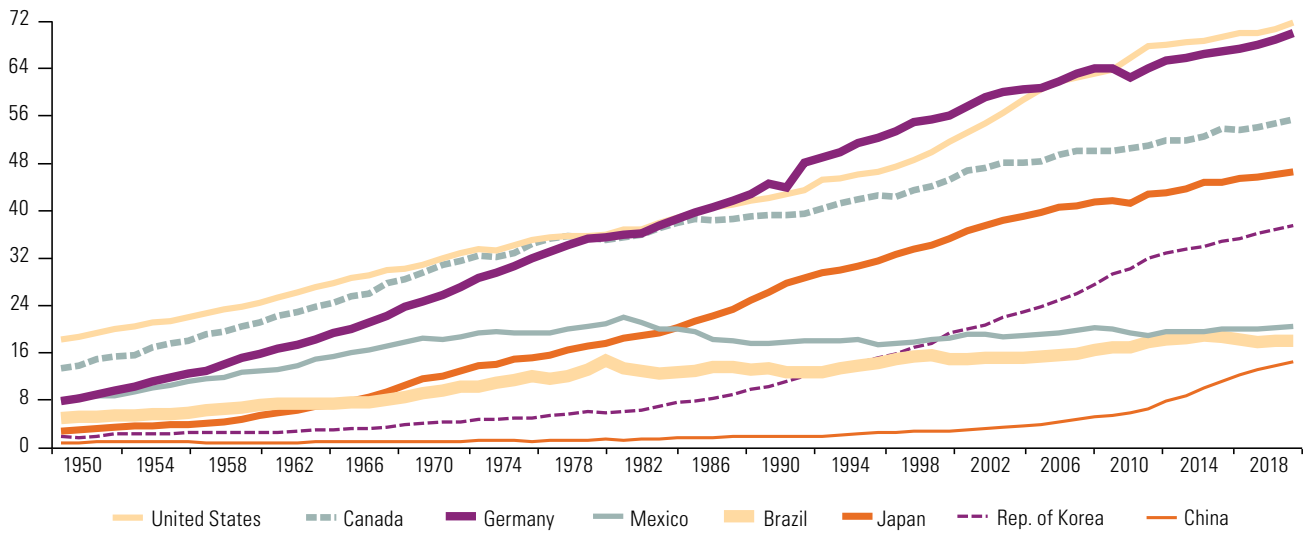
Geographic location and targeting have played a very important role in the automotive, electronics and aerospace industries, fostering the creation of production ecosystems and enhanced technological, logistical, business and human-resource capabilities. Indeed, the spread of globalization manifested by production fragmentation and the signing of NAFTA boosted the attraction of FDI to technology-intensive advanced manufacturing, resulting in higher productivity in the industries involved. In the main, this benefitted sectors that were already developed and regions suited to hosting the new industries, especially in northern and central Mexico. As a result, the federal entities along the northern border (Chihuahua, Coahuila, Baja California, Nuevo León, Tamaulipas and Sonora) are responsible for around 60% of exports, leading to uneven territorial development.

Figure II.9
Mexico and selected countries: labour productivity per hour worked, 1950–2018
(Dollars at constant 2017 prices in purchasing power parity terms)

A. Mexico: per capita gross domestic product (GDP) and labour productivity per hour worked



B. Selected countries: labour productivity per hour worked

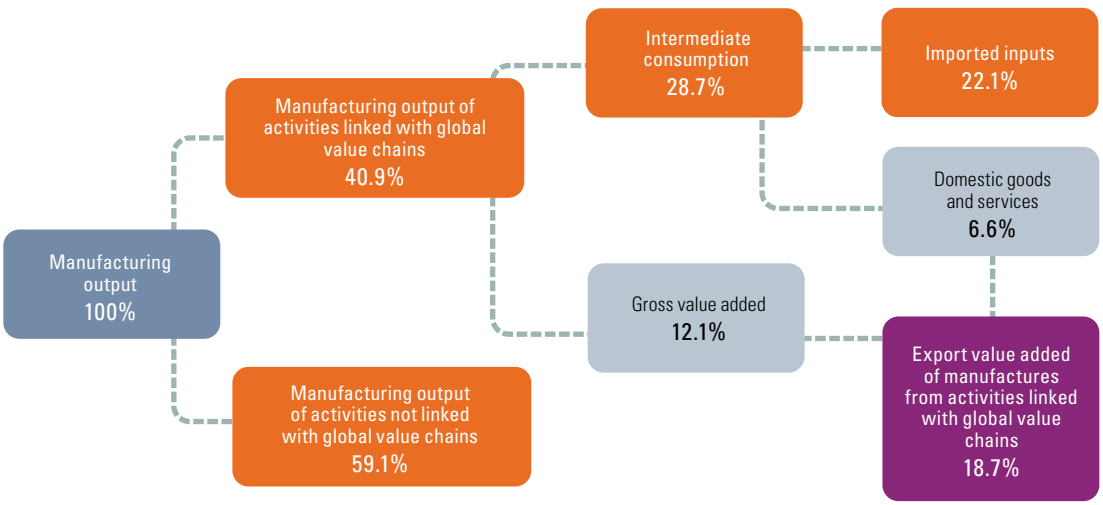


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of The Conference Board, Total Economy Database [online database] https://www.conference-board.org/data/economydatabase/index.cfm?id=27762.

The productivity gap between Mexico's modern and traditional sectors has therefore widened significantly over the past 25 years. These two Mexicos are moving in opposite directions. Productivity has grown by 5.8% a year in large, modern firms integrated into global value chains but has fallen by 6.5% a year in traditional firms. In 1999, small, traditional firms were 28% as productive as large, modern ones, dropping to 8% in 2009 (McKinsey & Company, 2014). To offset falling productivity, traditional firms employed more people but on lower wages. While the wage share of GDP declined, corporate profits as a share of GDP increased (Samaniego, 2015).

The tight integration of Mexico's dynamic sectors into North American global value chains has made it difficult to increase the domestic content of exports. Mexican companies integrated with global value chains tend to be highly reliant on imported inputs, limiting their contribution to the development of a dynamic and properly structured domestic industry. In 2016, activities within global value chains accounted for around 41% of total manufacturing output, of which imported inputs totalled 22%, intermediate consumption sourced domestically totalled 7% and the remaining 12% was gross value added.[4] Therefore, the export value added generated by manufacturing activities within global value chains (that is to say, the value of the domestic content exported in manufactures from these chains) was 18.7% of total manufacturing output and 45.9% of output from these modern sectors (see diagram II.1). The activities that contributed the most to export value added were vehicle manufacturing (22.5%), autoparts (8.6%), electronic components (3.6%), audio and video equipment (3.1%) and computers (2.2%) (INEGI, 2017).

Diagram II.1
Mexico: manufacturing output of activities linked with global value chains, 2016
(Percentages)

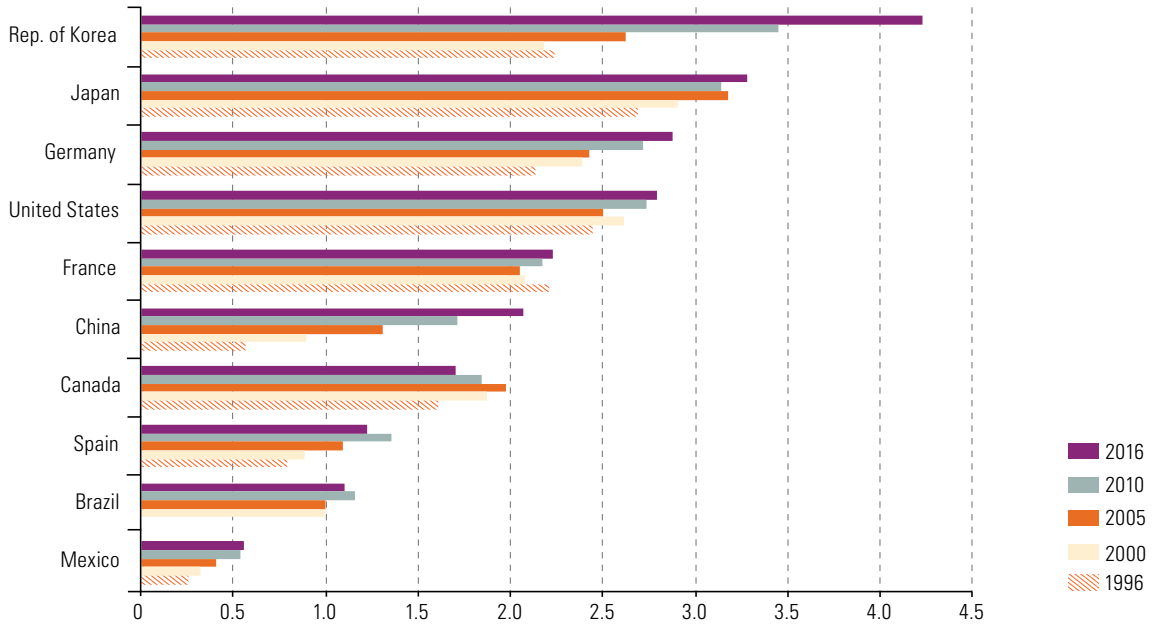


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of National Institute of Statistics and Geography (INEGI), *Valor agregado de exportación de la manufactura global 2016*, Mexico City, 30 November 2017 [online] http://www.beta.inegi.org.mx/contenidos/saladeprensa/boletines/2017/vaemg/vaemg2017_11.pdf.

Finally, Mexico is lagging in terms of innovation, which is key to meeting the new challenges of rapid technological change. Mexico's situation is characterized largely by low R&D spending, weak linkages between industry and academia, constraints on specialized human capital formation, lack of a strong innovation culture and weak support institutions with few instruments for promoting business innovation. In 2016, R&D spending comprised 0.5% of GDP, close to the Latin American average and one of the three lowest among member countries of the Organization for Economic Cooperation and Development (OECD) (see figure II.10). In addition, two thirds of R&D spending was financed chiefly by Mexico's public sector, unlike in advanced countries where the private sector finances over 60% of such investment (CONACYT, 2017 and OECD, 2018).

[4] A subset of the manufacturing sector comprising firms whose inputs are sourced mainly from abroad and whose output is destined mainly for export. Foreign investors have a majority shareholding in many such firms, meaning that they are controlled by transnational companies with strategic interests in a global value chain (INEGI, 2017).

Figure II.10
Selected countries: research and development spending, 1996–2016
(Percentage of gross domestic product)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Organization for Economic Cooperation and Development (OECD), "Gross Domestic Spending on R&D" 2018 [online] https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm.

Thus, the profile of modern sectors within global value chains —sustained by low relative wages, high contribution of imported inputs and low domestic content— fails to foster innovation capacity-building and may be critical in explaining the country's low productivity levels. Indeed, a preference for imported technology for innovation capacity-building has resulted in lower than expected technology transfer owing to huge flows of exports and FDI (Stezano, 2018).

As the manufacturing industry becomes increasingly sophisticated, traditional powerhouse manufacturing economies of the twentieth century (the United States, Germany and Japan) could rein in the offshoring of production to low-cost countries and return to manufacturing in their countries of origin. Key to this process has been these nations' effort to strengthen innovation, human capital, and ecosystems and clusters, enabling them to compete with renewed strength with their low-cost rivals (such as China, India and Mexico). Soon, the most competitive countries are likely to be those shifting to models of higher-value advanced manufacturing, underpinned by robust innovation and technology ecosystems. As global manufacturing trends continue to shift towards higher-value products and services, many countries have invested heavily in establishing national innovation ecosystems which connect people, resources, policies and organizations to efficiently translate new ideas into commercialized products and services (Deloitte, 2016).

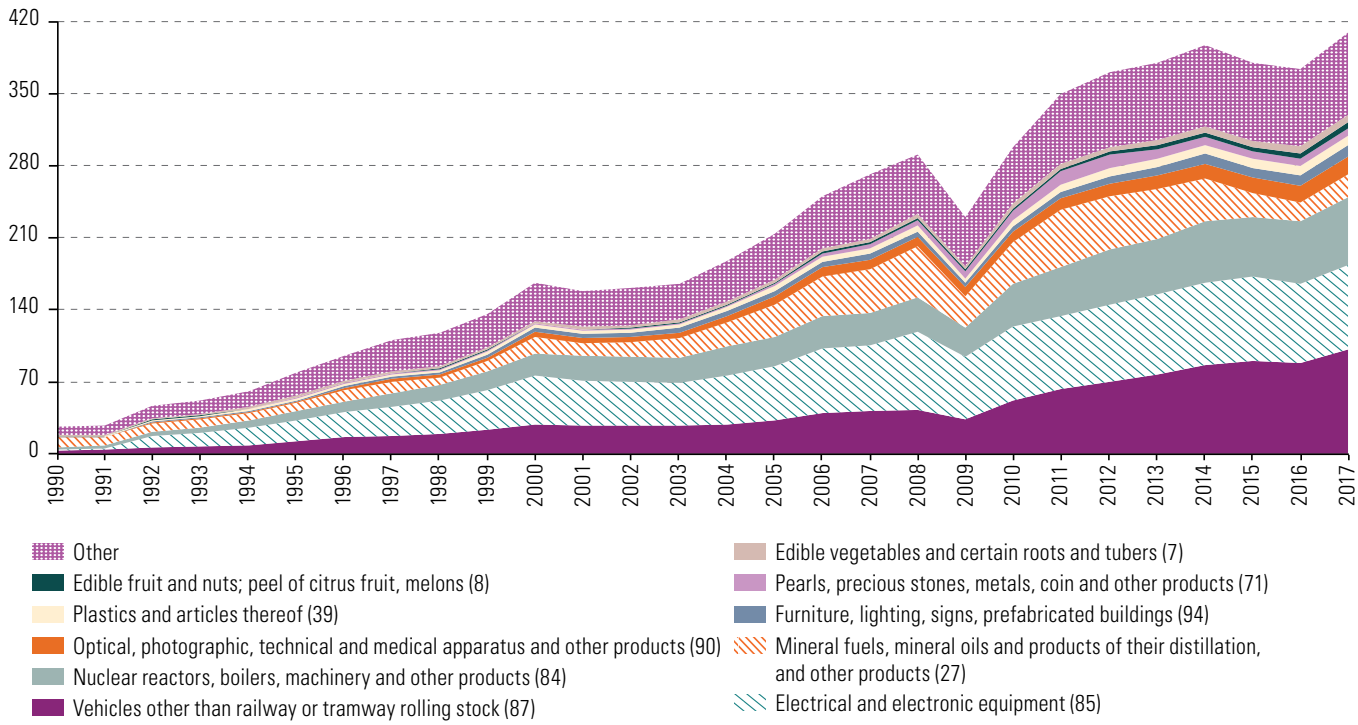
These leading manufacturing countries are continuously investing in R&D through public means, while incentivizing the private sector to conduct its own research through the development of collaborative innovation ecosystems. Evidence shows that the integration of public, private and academic actors to build and sustain these renewed production ecosystems based on science, technology and innovation yields significant benefits for participating manufacturers.

By contrast, Mexico's productivity remains stagnant and curbs the stimulus to increase wages. The reduction in the cost per hour worked has hindered faster automation. Yet, if the operational cost of automation continues to fall, the accompanying rise in productivity will not necessarily lead to the reabsorption of displaced jobs and activities or to the creation of new ones.

B. Challenges to advanced manufacturing in Mexico: the automotive, electronics and aerospace industries

Between 2010 and 2017, the manufacturing sector accounted for 54% of FDI inflows and 85% of exports. The modern sectors, within global value chains, have been central to this dynamic, spearheaded by the automotive, electronics and aerospace sectors (see figure II.11). Mexico has positioned itself as a key player in global value chains, oriented mainly towards the North American market, having established a production base close to the technological frontier but still sustained by competitive advantages based on geographical proximity, lower wage costs and trade agreements.

Figure II.11
Mexico: export value of the ten main export categories, 1990–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).
Note: The categories have been defined on the basis of the two-digit Harmonized Commodity Description and Coding System.

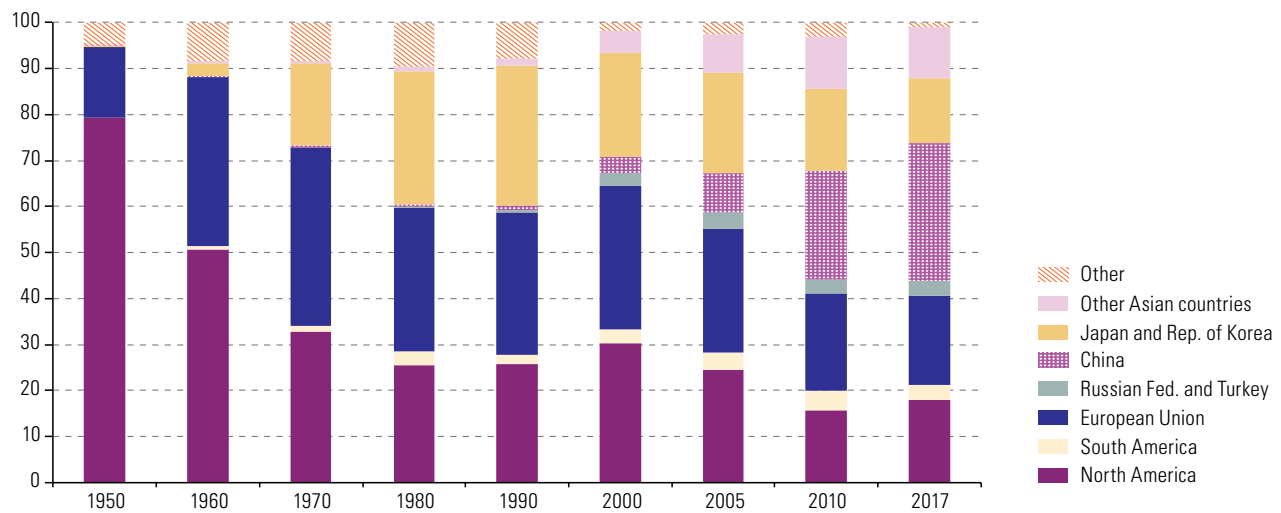
However, across the globe, technological progress is bringing rapid and far-reaching change in several areas, including production methods, product characteristics, industry boundaries and business models. This has prompted leading transnational companies to deploy new manufacturing models, based on the use of digital technologies to control the physical world, by synchronizing equipment, processes and people, creating high-productivity jobs, promoting innovation and contributing to sustainable growth (ECLAC, 2018). This could alter the coexistence of Mexico's modern and traditional sectors in at least two ways. First, the greater ease with which transnational companies can incorporate technological progress into their production processes could widen existing capacity gaps with traditional sectors. Second, new technologies are beginning to erode the traditional competitive advantages of Mexico's modern sectors, encouraging the reshoring of production activities to advanced economies.

1. The automotive sector: a catalyst and driver of major production and technological changes

(a) The global automotive industry at the threshold of the greatest transformation in its history?

Global vehicle production has grown steadily from 58 million units in 2000 to 97 million units in 2017. In stylized terms, the industry is concentrated in three macroregions (North America, European Union and Asia) where a small group of countries (United States, Germany, Japan, Republic of Korea and China) has maintained its strong dominance in terms of production, vehicle manufacturing, supply and technological development. The first three countries have dominated the industry for decades but China has been growing rapidly and has now become the world's largest vehicle producer (ECLAC, 2017) (see figure II.12).

Figure II.12
Vehicle production, selected regions and countries, 1950–2017
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the International Organization of Motor Vehicle Manufacturers (OICA) [online] http://www.oica.net/category/production-statistics/2017-statistics/.

Over recent decades, manufacturing activities have come to acquire a strong global orientation, as many operations were transferred from advanced economies to developing countries to reduce costs. With the start of the new century, the relocation of production was consolidated as a key element of the strategies of leading global manufacturers (see figure II.12). Moreover, the automotive industry underwent an intensive process of deverticalization, which increased the role of suppliers of parts, components and systems and resulted in a tier system. This led to the development of geographically close, highly reliable suppliers that acquired increasingly complex functions. Between 1985 and 2015, suppliers' contribution to the industry's total value added increased from 56% to 82% (Kallstrom, 2015). All this triggered massive growth in global trade in the automotive sector, with a strong regional bias, as reflected in the strategy of automakers and their suppliers.

Mexico was one of the priority destinations for the process of production restructuring in the automotive industry and is now the world's seventh biggest producer and fourth biggest exporter of vehicles and the sixth biggest producer and fifth biggest exporter of autoparts. Moreover, the country has undergone a rapid transformation, especially since the global financial crisis, evolving from a low-cost platform for mass-market vehicle assembly into an integrated production chain that is more diversified in terms of products and technological sophistication (ECLAC, 2017).

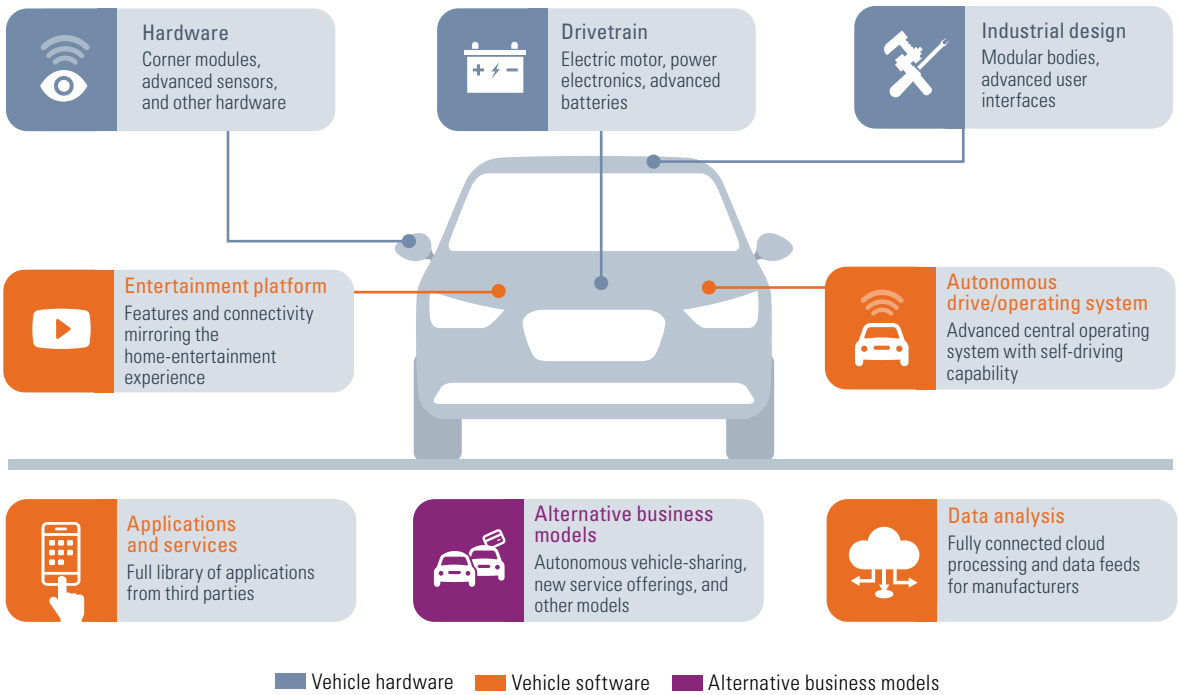
The automotive industry is now at a major crossroads. The technological revolution, changes in the concept of mobility and growing concern for energy efficiency and the environment are some of the factors that are straining and altering the structure and relationships within the industry. Although changes in production and consumption are, as yet, very limited, there is great uncertainty about how, how fast, when and where these trends will become widespread. In stylized terms, there are at least three major trends that will determine the characteristics of the industry in the near future:

- Rapid convergence with the digital economy (connectivity, autonomous driving, artificial intelligence and entry of new players from the digital economy).
- Increased regulatory requirements in the fields of safety, energy efficiency and the environment (electromobility, far-reaching changes in the traditional production chain).
- Changes in the concept of mobility and in consumption patterns (extension of the production chain, sharing economy, vehicle use as opposed to purchase, erosion of brand loyalty).

The incorporation of digital technologies into vehicles is growing rapidly (see diagram II.2). With a set of features very different from those of current vehicles, the cars of the future will depend increasingly on software and electronics. Some of the hardware components will be quickly replaced by an optimized design and better software functionality.

An estimated 75% of production will consist of connected vehicles by 2020, with the figure set to rise to 95% in mature markets (North America, European Union, Japan, Republic of Korea and China) by 2025 (Lazard/Roland Berger, 2017). As vehicles become interconnected, with infrastructure and a wide range of devices (intelligent transportation based on the Internet of Things), driving safety and efficiency will improve, urban traffic congestion will be alleviated and new business models and services will emerge (including entertainment, navigation, rescue and management). The maturation and deployment of fifth-generation mobile telecommunications infrastructure (5G) will facilitate and accelerate technology convergence and the spread of autonomous driving.

Diagram II.2
The car of the future: a computer on wheels



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from McKinsey & Company, *How the Convergence of Automotive and Tech will Create a New Ecosystem*, November 2016.

Changes in car use will be another part of this process. As the sharing economy expands and consumer preferences change, the traditional model is set to evolve from individual purchasing to new forms of ehailing and vehicle sharing. This will drive a new range of on-demand mobility solutions, especially in dense urban environments that proactively discourage private car use (McKinsey & Company, 2016b). In the United States and European Union, people are buying fewer cars, driving less and getting fewer driver's licences, suggesting a major cultural shift away from individual car ownership (Klaffke, 2017).

Between 2016 and 2030, the number of vehicles being used in mobility services could grow at an annual average rate of 14%, from 22 million to 130 million vehicles, and represent 8% of the total number of vehicles on the road worldwide, especially in cities (Bank of America Merrill Lynch, 2017). By 2025, the sale of new vehicles for these new mobility services could have risen to between 10% and 15% in the United States and European Union and to 35% in China (Lazard/Roland Berger, 2017). By 2050, this could reach 50% globally (Litman, 2018). New vehicle sales are expected to continue to grow but at a lower rate than at present. New mobility services may result in a decline of private vehicle sales, but this decline is likely to be partially offset by increased sales in shared vehicles that need to be replaced more often due to higher utilization and related wear and tear (McKinsey & Company, 2016b).

Across the globe, new and innovative mobility providers have captured the interest of consumers and venture capital alike. These ventures, usually startups, are disrupting car manufacturers because they threaten their share of automotive industry profits. In

recent years, leading automakers have multiplied their efforts in the mobility space, as a way to hedge their bets against a possible substantial shift in transportation preferences, towards a multimodal system that is less centred on personal cars. These manufacturers are experimenting with several business models and have started investing in, partnering with, and acquiring mobility and tech companies (CAR, 2018a). Automakers could use these new mobility services as an opportunity to overcome structural constraints in the industry and as a way of negotiating the current process of technological change, particularly with respect to autonomous vehicles.[5]

Connectivity, and later autonomous technology, will increasingly allow the car to become a platform for drivers and passengers to use their transit time for personal activities, which could include the use of novel forms of media and services (McKinsey & Company, 2016b). The vehicles of the near future will be real computers on wheels (see diagram II.2). Depending on acceptance of shared mobility, the market share of autonomous vehicles could increase from under 1% in 2020 to a likely peak of 26% in around 2035 (Lazard/Roland Berger, 2017).

It is estimated that, by 2030, the production of internal combustion-powered vehicles will have decreased dramatically, while that of electric-powered vehicles will have increased significantly. In 2017, global sales of electric vehicles totalled 1,233,600 units, up 58% on the previous year. Sixty-six per cent consisted of battery or all-electric vehicles, with the remaining 34% plug-in hybrid electric vehicles.[6] The biggest market was China (49.5% of sales in 2017), followed by the United States (16.3%), Norway (5%), Germany (4.9%) and Japan (4.6%). By the end of 2017, there were 165 electric vehicle models available for sale and more than 90,000 charging stations worldwide, although these are concentrated in regions with the highest electric vehicle sales (Frost & Sullivan, 2018). The Renault-Nissan group is currently the world's biggest seller of electric vehicles. However, Chinese firms have come to play an increasingly prominent role in this segment (BYD Group, BAIC Group, Geely Group and SAIC Group), overtaking large manufacturers such as BMW, Volkswagen, General Motors and the surprising Tesla (EV Sales, 2018).

Today's continuous technological improvements, increasing electric-vehicle charging infrastructure and explicit goals and promotion policies set by national governments confirm that this trend will continue, narrowing the cost-competitiveness gap between electric and internal combustion-powered vehicles. There is a good chance that the global electric car stock will range between 9 million and 20 million by 2020 and between 40 million and 70 million by 2025 (IEA, 2017). In an optimistic scenario, by 2025, electric vehicles could total 47%, 20% and 32% of new car sales in China, the United States and the European Union, respectively (Lazard/Roland Berger, 2017). In recent months, leading manufacturers have made important announcements about their commitment to electromobility as a central pillar of their strategies to meet the challenges of the near future (see table II.2).

5 Most automakers have announced that their first self-driving vehicles will be available through mobility services, and the business side of deployment might prove to be as important as the technology side (CAR, 2018a).

6 Plug-in hybrid electric vehicles have batteries that can be charged by plugging the vehicle into an external power supply. The plug-in hybrid vehicle combines the characteristics of a traditional hybrid electric vehicle and an electric vehicle, as it is equipped with both an internal combustion engine (gasoline, diesel or flexible fuel) and an electric motor accompanied by a battery pack, the difference being that the batteries can be charged by plugging the vehicle into the grid.

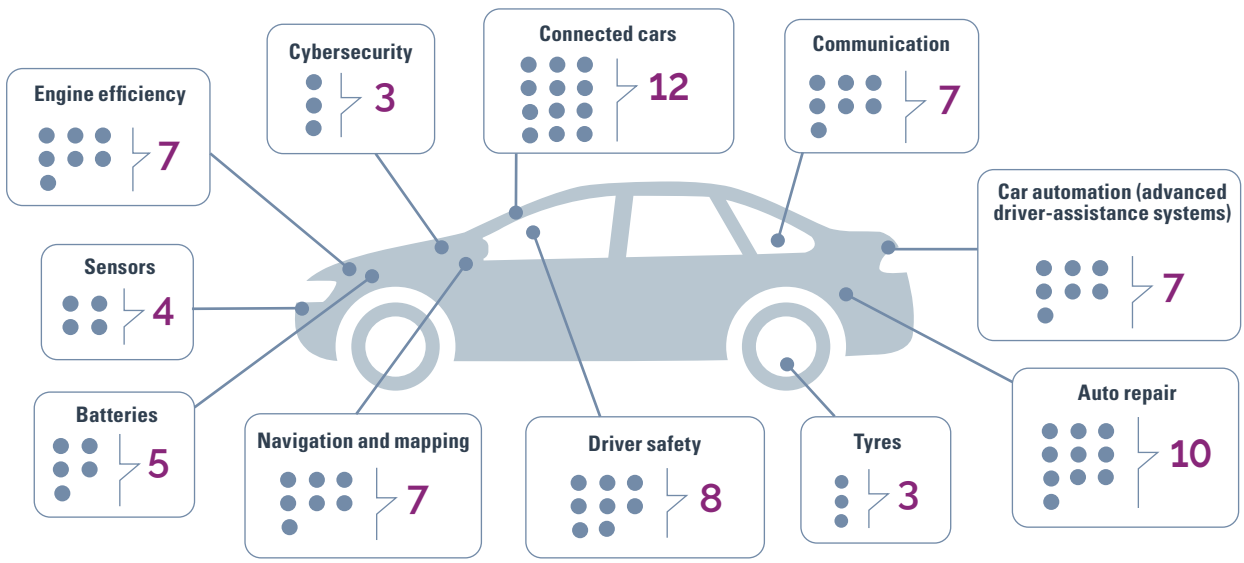
Table II.2
Leading automakers: new electromobility strategies, 2017–2018

Firm	Date	Announcement
北京汽车 BAIC MOTOR	December 2017	The Chinese manufacturer announced that it will phase out conventional internal combustion-powered vehicles by 2025. It will stop selling conventional cars in Beijing in 2020 and will cease production and sales nationwide by 2025 (Reuters, 2017b).
BMW	December 2017	BMW is planning for 15% to 25% of its vehicle production to be electric-powered by 2025. To this end, it is developing a new, flexible and modular production platform —cluster architecture [CLAR]— which will be introduced in 2021 with the launch of the iNext electric vehicle. Over the next seven years, BMW will roll out 25 electric-powered models, 12 of which will be all-electric, some completely original models (InsideEVs, 2017). It also plans to make the Mini brand all-electric in the United States and could launch an electric sport utility vehicle (SUV) in 2021 (Electrek, 2018).
CHANGAN	October 2017	The Chinese manufacturer announced that it will stop selling fossil fuel-powered vehicles by 2025. The company presented a plan to earmark US$ 15 billion and to mobilize 10,000 research and development (R&D) workers to develop new electric vehicles. By 2025, the company will offer 21 new all-electric models and 12 hybrid models (Reuters, 2017c).
Ford	January 2018	Ford announced that it will double its investment in electric vehicles to US$ 11 billion by 2022 to produce 40 new electric vehicles. This far exceeds the US$ 4.5 billion announced in 2015. Of Ford's planned 40 electric vehicles, 16 will run solely on batteries. The company has named only one model: Mach 1, an electric SUV that will go on sale in 2020 (Reuters, 2018).
GM General Motors	October 2017	General Motors announced that it will manufacture 20 all-electric models by 2023. The company plans to produce some battery-powered electric vehicles and hydrogen fuel-cell vehicles that will also run on electricity. The company has speeded up its electrification strategy in response to the market requirements of China and the European Union, which have banned the sale of internal combustion engine-powered vehicles as from 2025 and 2030 (Bloomberg, 2017b).
HONDA	June 2017	The company announced that two thirds of its sales will consist of electric vehicles in 2030 and that it will put a central focus on hybrid models. However, the company will continue to strengthen the development of electric vehicles, as well as fuel-cell vehicles, in addition to a China-exclusive model scheduled to go on sale in 2018 (Autovista Group, 2017).
HYUNDAI	December 2017	The company announced that Hyundai and its Kia subsidiary will launch a total of 38 new electric vehicles. In late 2017, Hyundai and Fiat Chrysler Automobiles were looking to form a partnership to develop hydrogen fuel-cell technology. While it is still committed to mass-producing hydrogen-powered vehicles, Hyundai will launch 10 hybrid and electric cars over the next two years (Green Car Reports, 2017).
Mercedes-Benz	July 2017	Mercedes-Benz announced that all its models will come in an electric or hybrid version by 2022. It will offer a total of over 50 versions of electric-powered vehicles, both hybrid and electric. The company expects electric models to make up 25% of its sales by 2025 (Engadget, 2017). A large proportion of its electric vehicle production will be sold in China, where the vehicles will be manufactured jointly with BAIC. Mercedes-Benz is investing heavily in the launch of its new EQ range, starting with an electric SUV in 2019 (Motor1, 2018). Meanwhile, Smart combustion-engine versions will no longer be on offer after 2020 (The Verge, 2018).
NISSAN	March 2018	The Japanese manufacturer's strategy over the next four years, "Nissan M.O.V.E to 2022", is to expand electric vehicles, autonomous driving and connectivity services. By 2022, Nissan is aiming to sell 1 million electric-powered vehicles per year, for which it will launch eight new all-electric models, building on the success of the Nissan Leaf (more than 300,000 units sold since 2010). Half will be targeted at the Chinese market. Starting in 2021, it also plans to make all new models in the Infiniti high-end brand either all-electric or featuring e-POWER electric-drive technology. By 2025, Infiniti expects electrified vehicles to make up 50% of its global sales (Nissan, 2018).
PSA GROUPE	January 2018	PSA announced that, in 2025, it will start offering an electric-powered version of all models in its five brands (Peugeot, Citroen, Opel, Vauxhall and DS Automobiles). This year, the group will offer 40 electric models worldwide (CleanTechnica, 2018). In May 2018, it announced that all vehicles in the DS brand will be electric by 2025 (Electrive, 2018).
RENAULT	October 2017	The Renault group launched its "Drive the future, 2017-2022" strategic plan in which it announced 21 new vehicles by 2022, of which 3 will be totally new models, 8 electric and 12 electrified. The plan seeks to leverage the R&D work and economies of scale from a new alliance between Renault, Nissan and Mitsubishi, currently the world's largest automotive alliance (AutoExpress, 2017).
TESLA	November 2017	Between 2018 and 2020, Tesla plans to manufacture 500,000 units of its Model 3, the first affordable compact electric car. In late 2017, Tesla presented an electric truck (the Semi) and a high-end sports model (the Roadster 2). With these new launches, Tesla plans to become a global electric vehicle producer, offering a wide range of options to different consumers (The Verge, 2017).
TOYOTA	December 2017	Toyota announced that, by 2030, at least 50% of its sales will consist of electric and hybrid vehicles, compared with the current 15%. The company plans to sell 5.5 million units by 2030 (4.5 million hybrid cars and 1 million cars with electric motors or fuel cells) (GlobalFleet, 2017). In addition, Toyota and Mazda will conclude an agreement to develop electric vehicles jointly (Forbes, 2017).
Volkswagen	July 2017	By 2030, Volkswagen will build electric versions of all 300 models in the group's 12brand line-up, for which it will invest around 20 billion euros, in addition to spending 50 billion euros to buy the batteries needed to power the vehicles. By 2025, the company aims to have 50 electric vehicles and 30 hybrid models in its line-up. In 2018, Audi will start selling its first all-electric SUV and will add two more purely battery-powered vehicles in the next 3 years, with an electric-car line-up comprising 12 models by 2025 (Bloomberg, 2017c). The first major test will be the launch of the Volkswagen ID, which will come into production in late 2019 (Autocar, 2018).
VOLVO	July 2017	Volvo announced that all its cars will be electric or hybrid as from 2019. With this, the Swedo-Chinese brand plans to lead the way in electric technology in vehicles and to sell 1 million units by 2025. The company plans to launch five new electric cars between 2019 and 2021, two of which will be sold under the Polestar brand, with the other three sold under the Volvo brand (The Guardian, 2017).

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the companies.

With increasingly sophisticated products and shorter life cycles, production processes are becoming increasingly complex and call for greater technological and logistical capabilities from automakers and their suppliers. This has forced automotive firms to enter more technologically advanced segments, such as new lighter materials, batteries, software and electrical engineering, and specialized hardware, including sensors, cameras and radar. In addition, leading automakers will start to concentrate their global production in a small number of new modular platforms, forcing firms in the production chain to increase funding for research, development and innovation (ECLAC, 2017). Vehicle manufacturing calls not only for continuous technological upgrading to meet increasingly sophisticated consumer requirements and to keep up with competitors, but also for coordination among a large number of stakeholders. As a result of technological change and convergence, new participants in the chain are now gaining ground rapidly (see diagram II.3).

Diagram II.3
Number of new electronic component and digital and software suppliers



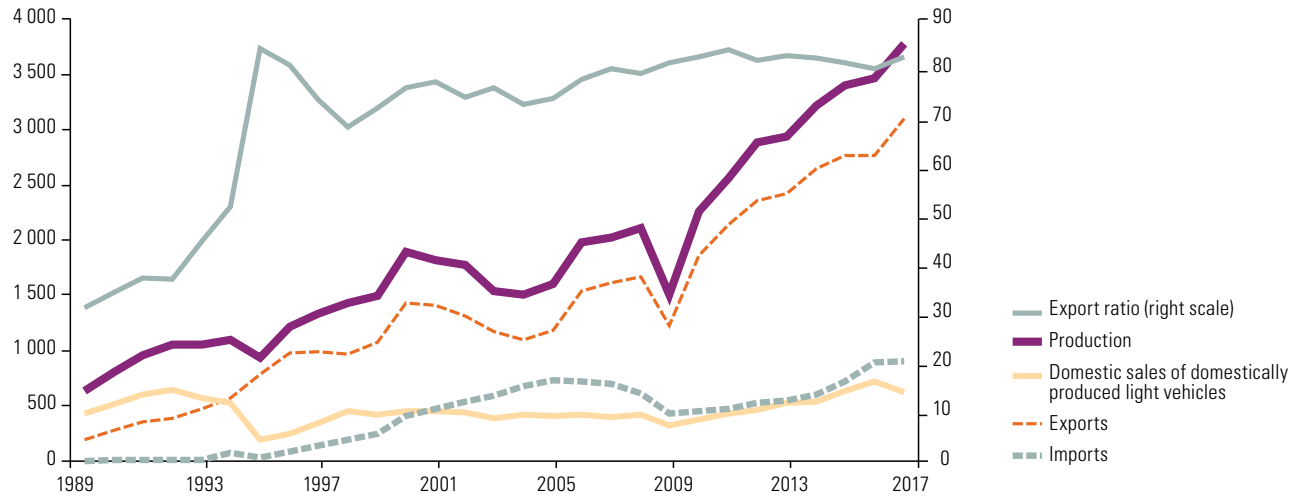
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from T. Klaffke, "A new way of thinking about the automotive industry", QMarkets, 14 June 2017 [online] https://www.qmarkets.net/blog/new-way-thinking-automotive-industry/.

In short, the global automotive industry is undergoing an intense process of transformation, driven by the evolution of technology, consumption patterns and regulatory architecture. Generally speaking, automakers and the biggest and most important global suppliers are well positioned in global value chains and are proving to be adaptable to new conditions, the entry of new technology industry competitors, the rise of China and the transformation and blurring of the automotive sector's traditional boundaries. These factors are influencing many of the strategic decisions of the industry's leading transnational companies, both automakers and suppliers. Some of the key determinants, particularly for a country like Mexico, are the location and importance of the different activities along the global value chain.

(b) Mexico: performing well in uncertain times

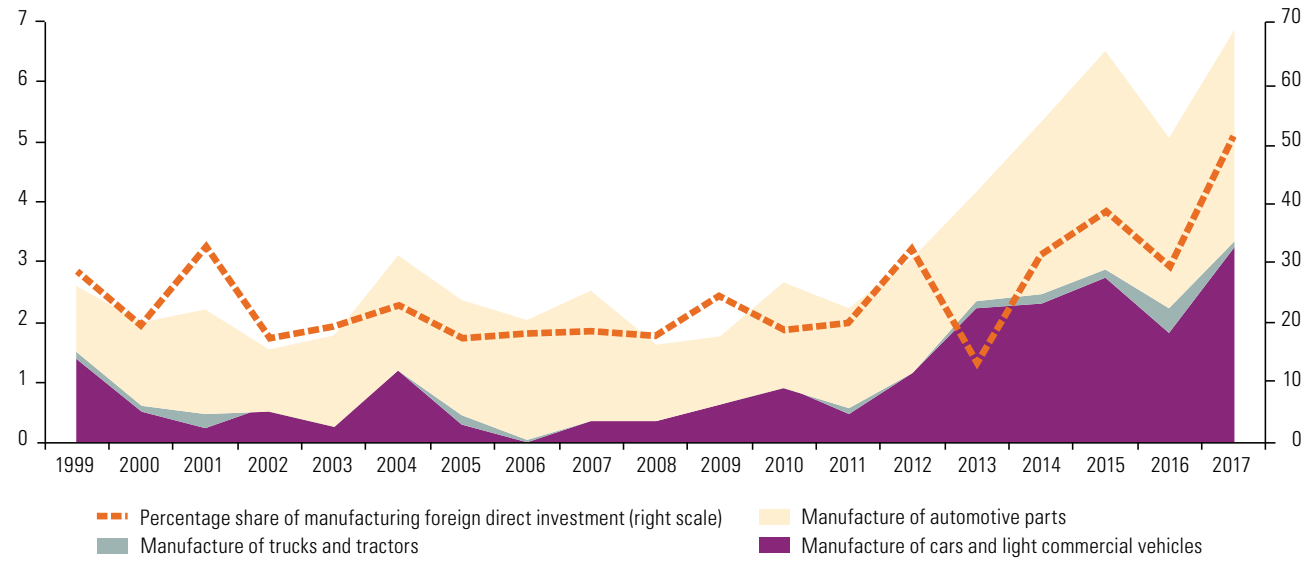
Since the global financial crisis of 2008, Mexico's automotive industry has experienced an unprecedented boom (see figure II.13). The severe impact of the crisis on United States industry prompted dozens of companies to change their expansion and location strategies. This led to a huge increase in FDI, from both manufacturers and suppliers, and in trade in Mexico. Between 1999 and 2017, Mexico received around US$ 60 billion, of which 63% went to the autoparts subsector (see figure II.14). The automotive industry is now the country's main foreign-exchange earner, contributing far more than remittances or tourism. Thus, a sustained and growing trade surplus began to take shape, totalling US$ 59.213 billion in 2017.

Figure II.13
Mexico: production, exports, imports and domestic sales of domestically produced light vehicles, 1989–2017
(Thousands of units and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from Mexican Automotive Industry Association (AMIA).

Figure II.14
Mexico: foreign direct investment in the automotive industry, 1999–2017
(Billions of dollars and percentages)

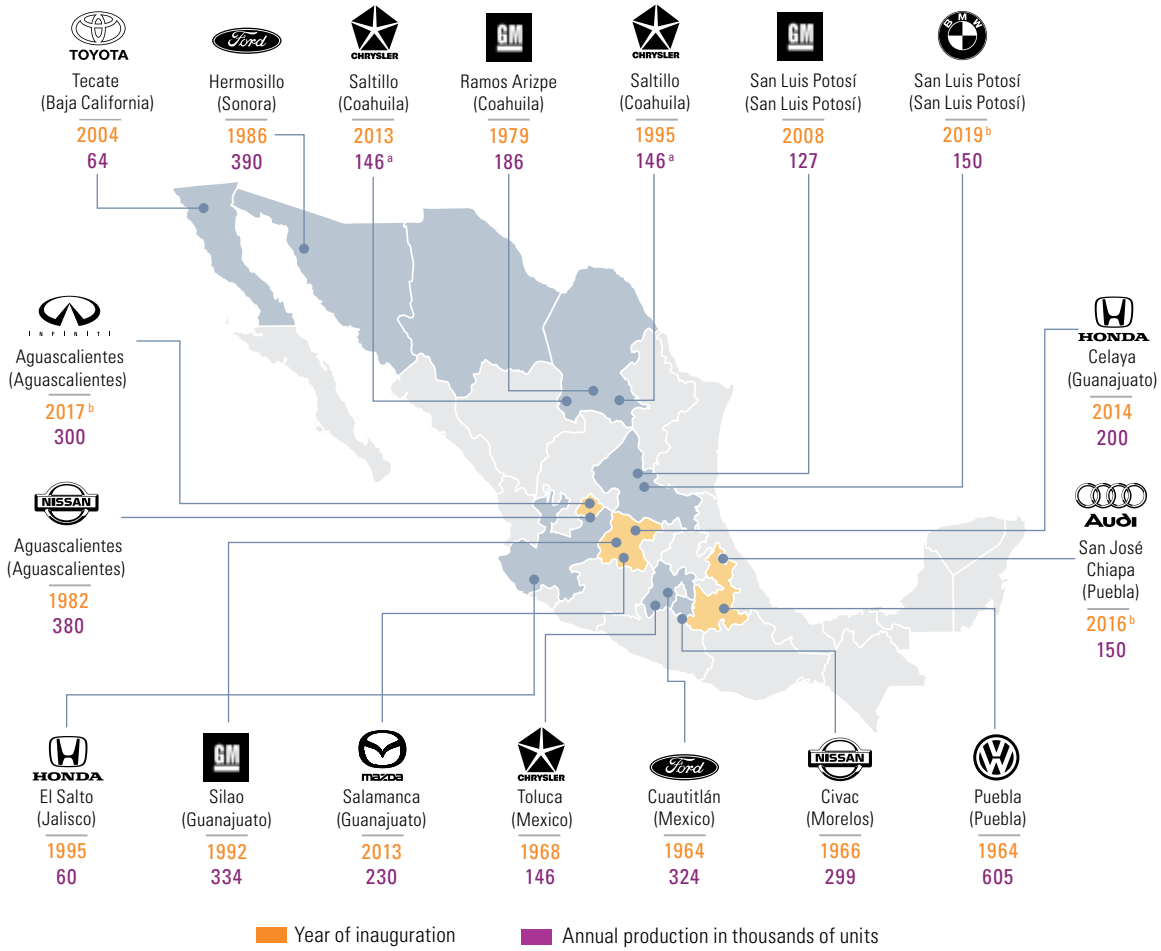


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the Secretariat of Economic Affairs of Mexico [online] https://datos.gob.mx/busca/dataset/inversion-extranjera-directa.

As a counterpart to this trend, the United States began to run a large trade deficit with Mexico, with the automotive sector as the main culprit. One of the key pledges of the 2016 United States presidential campaign was to rectify this situation and this was a decisive factor in President Trump's new administration, triggering a complex renegotiation of NAFTA. Despite this tricky situation, Mexico's automotive industry achieved its best ever performance in 2017.

At present, nine global automakers have production operations in Mexico (Fiat Chrysler Automobiles, Ford Motor Company, General Motors, Honda, Kia Motors, Mazda, Nissan, Toyota and Volkswagen), to be joined by a further two by the end of this decade (BMW and Mercedes-Benz). The final assembly industry for light vehicles comprises a total of 20 manufacturing complexes in 14 states (see map II.1). Over the past five years, large FDI inflows have resulted in 10 new automotive plants: 5 built by manufacturers that formerly did not operate in the country (Audi, BMW, Kia, Daimler and Toyota-Infiniti) and 5 by incumbent manufacturers. Some of these new plants are among the largest and most modern in North America. Thanks largely to these new plants, Mexico is diversifying its specialization in compact and subcompact vehicles with a view to positioning itself in the demanding high-end segment by virtue of the presence of Audi, BMW, Infiniti and Mercedes-Benz (ECLAC, 2017).

Map II.1
Mexico: light-vehicle manufacturing plants, 2018



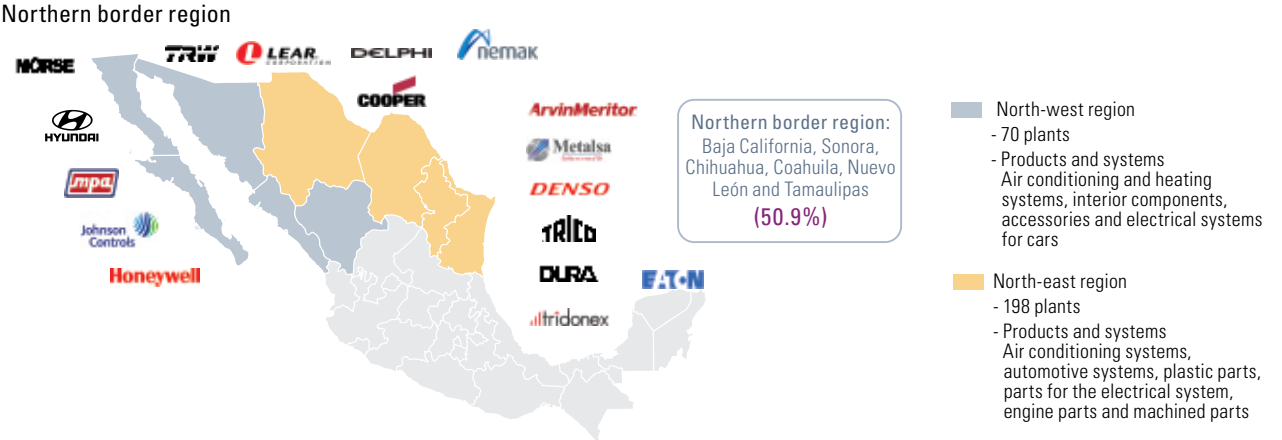
Source: Economic Commission for Latin America and the Caribbean (ECLAC).
[a] Average production per plant.
[b] Estimate.

Production has grown in three major regions of the country, as a natural extension to the United States industry. In the mid-twentieth century, the sector began to become established in Mexico's central region. Subsequently, it expanded in the northern border region on the back of promotion policies and, after the 2008 crisis, it also began to grow strongly in the Bajío lowlands region, in the states of Aguascalientes, Querétaro and Guanajuato. The three regions currently have a similar share of domestic production. In the north, there is the Monterrey-Saltillo corridor, where some of North America's biggest assembly plants are situated and nearly 30% of domestic production of autoparts and components is concentrated. In the Bajío region, there is a cluster around Guanajuato comprising more than 300 firms, including General Motors, and a Volkswagen engine plant in Silao, Mazda in Salamanca and Honda in Celaya. In the central region, there are major Volkswagen and Audi plants in Puebla and San José Chiapa, and a large number of suppliers.

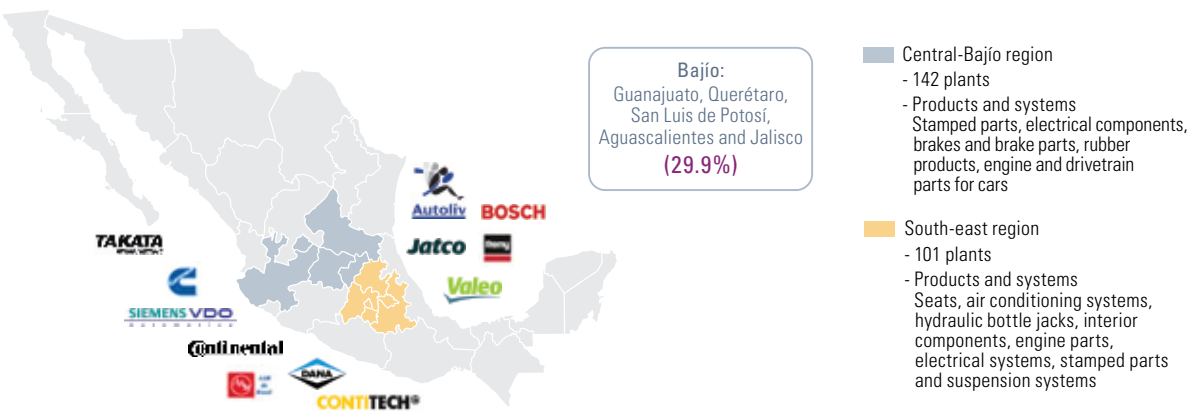
In Mexico, in 2017, there were some 2,600 plants manufacturing different parts, components and systems to supply the automotive industry, around 600 of which were tier 1.[7] The majority are subsidiaries of foreign companies and only 35% are Mexican companies. Although suppliers of autoparts are found throughout the country, production is concentrated in the states along the northern border (51%) and in the Bajío region (30%) (see map II.2).

Map II.2
Mexico: production of autoparts, including engines and drivetrains, by federal entity, 2017
(Percentage of all firms)

A. Northern border region



B. Bajío, central and south-east regions



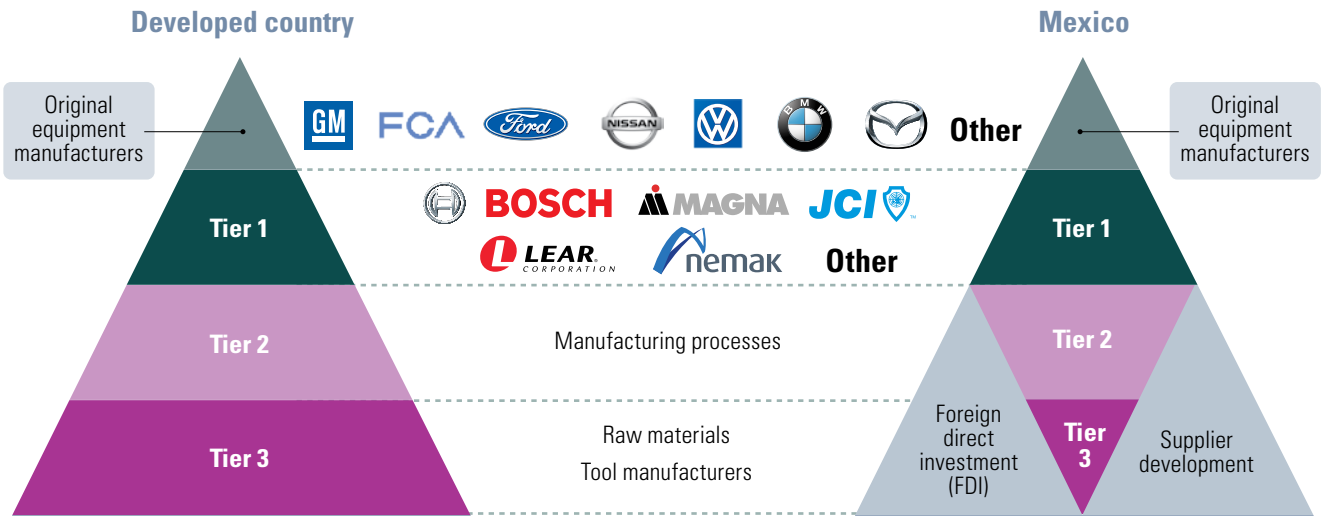
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from National Institute of Statistics and Geography (INEGI), Monthly Manufacturing Survey (EMIM) and National Automotive Parts Industry (INA).

[7] The automotive parts industry is organized according to a tier system. Tier 1 comprises companies that supply manufacturers directly and have global engineering and manufacturing processes, with modular production and design capabilities; they are responsible for developing engine parts, steering and suspension systems, and other parts and systems. Tier 2 comprises companies that supply tier 1 companies with specialized parts and components for making the most advanced modules and systems. Tier 3 comprises companies responsible for producing the more standardized and least technologically complex parts and components for automakers and companies in the replacement market.

This concentration reflects, first, the competitive advantages of setting up operations in Mexico and, second, the accumulation of technological and human skills. While many autoparts companies serve automakers operating in Mexico in order to comply with NAFTA regional value content requirements, the vast majority produce autoparts in Mexico for export directly to the United States, where around 64% of North America's vehicle production is concentrated (OICA, 2018).

After signing NAFTA, the supplier base became much broader and more diverse. Although all segments or tiers in the chain have grown, it is the segment comprising tier 1 and tier 2 foreign global suppliers that has grown the most, accentuating the inverted structure of Mexico's production chain (see diagram II.4). In Mexico, most of the international companies supplying autoparts are engaged in simple manufacturing linked with the assembly of components and systems. In this regard, local operations have been import- and labour-intensive. In recent years, some tier 1 suppliers (Delphi, Visteon, Bosch and Continental) have built their local capacity in the field of research, development and innovation. However, these initiatives have not been sufficient and the supply chain continues to be inverted, unlike in advanced countries and some emerging economies, such as China and India (see diagram II.4). In fact, all automakers and the vast majority of tier 1 suppliers in Mexico are foreign. Domestic companies are concentrated in the third and fourth tiers of the supply chain.

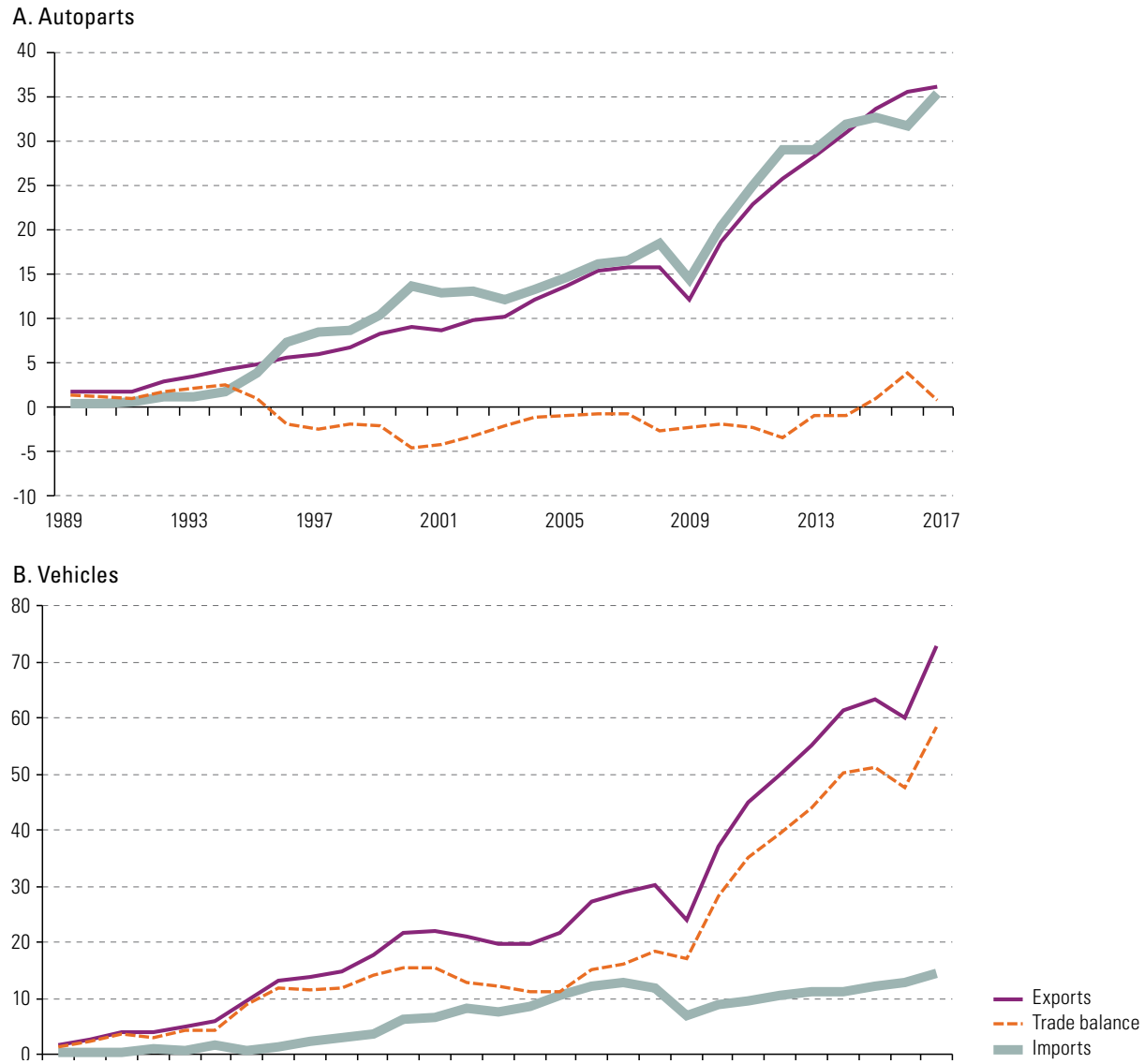
Diagram II.4
Automotive industry value chain



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the National Automotive Parts Industry (INA).

While trade in vehicles generates a sustained and growing surplus, autoparts have remained slightly in deficit and have only made a surplus in the past three years (see figure II.15). This reflects the strong reliance of local autoparts companies on imports and the lack of specialized suppliers in Mexico, with particular regard to the new features of highly frontier technology-intensive modern vehicles.

Figure II.15
Mexico: exports, imports and trade balance of autoparts and vehicles, 1989–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

In North America, automotive production is highly interconnected: automakers and suppliers purchase parts and components throughout the subregion, which may cross member countries' borders as many as eight times before arriving at a final assembly plant in one of three countries (Wilson, 2017). The average vehicle manufactured in Mexico or Canada has more United States content than a vehicle assembled in any other country in the world. The United States and Canadian content of a typical vehicle assembled in Mexico is 20% to 30% (and even as much as 40% in some cases) (CAR, 2016). By contrast, the average vehicle imported from outside the block has a North American content of just 3.5% (CAR, 2018b).

In Mexico, the automotive industry is by far the most closely integrated into global value chains. The value added generated by activities within global value chains (domestic content exported in manufactures in such chains) accounted for 18.7% of total manufacturing output. In 2016, manufacturing of cars and trucks (23%) and vehicle parts (9%) contributed around one third of the value added generated by the globalized

sectors (INEGI, 2017). In the case of vehicle assembly, activities within global value chains contribute 57% of total production, 35% of which consists of imported inputs. While the contribution of vehicle parts to total production is much the same (59%), imported inputs make up a much larger share (74%) (INEGI, 2018). Once again, this shows that a large proportion of such activities is confined to the assembly of components and systems using imported inputs, mainly from the United States.

As mentioned earlier, the outlook for Mexican industry has been altered by major investment from compact and subcompact vehicle manufacturers and the advent of new, high-end brands. In recent years, early signs have emerged of trends that are beginning to radically alter the global automotive industry. This could create the conditions for hybrid and electric vehicles to compete in the Mexican market, encouraging the development of infrastructure geared to these technologies (ProMéxico, 2016a).

In late 2017, Ford unveiled the first hybrid vehicle to be manufactured in Mexico: the Lincoln MKZ (*El Economista*, 2017). At the same time, it announced that it was transferring production of a small electric SUV from Michigan to Mexico (Bloomberg, 2017a). In addition, BMW stated that the flexibility afforded by its new San Luis Potosí plant would allow it to manufacture electric vehicles in Mexico and so meet the company's objective of increasing its global production of electric-powered vehicles to half a million in the short term (Expansión, 2018).

In short, Mexico's automotive industry has begun to shift from a low-cost platform to an increasingly sophisticated production system in terms of companies, products and support institutions. This has positioned Mexico among the world's leading economies from the standpoint of production, exports and FDI of vehicles and parts, components and systems for the automotive industry.

For decades, government authorities have provided ongoing support for Mexico's automotive industry, through targeted policies and horizontal measures.[8] While these measures do not appear to be in question at present, future challenges call for a new generation of policies to allow Mexico to preserve the gains achieved:

- To address a deficit in Mexico's trade balance, the automotive industry has become more important because of the large surplus it creates. This has been reflected in Mexico's position regarding the NAFTA renegotiation.
- The huge technological changes taking place in the global automotive industry make it important to design public policies that build capabilities in the production and innovation ecosystem, as well as to seek bigger and more efficient linkages between key stakeholders in the production chain to leverage the opportunities that these changes are beginning to throw up.
- In view of Mexico's production specialization in advanced manufacturing, where products have shorter life cycles, are increasingly technologically sophisticated and call for greater research, development and innovation, the production system must improve its capabilities in both traditional and disruptive technologies.
- Considering the complexity of new production systems, which call for a huge variety of skills that no single agent could be expected to possess, it is increasingly important to develop partnership-promotion mechanisms. Shorter innovation cycles and the huge investment required have made partnerships and alliances increasingly attractive alternatives. Unlike global companies and leading advanced manufacturing countries, Mexico seems to be finding it hard to move in this direction, with weak intermediary bodies and an industry structure in which local firms have little involvement, particularly the smaller ones.

[8] Some of the most important ones have been rolled out by the Secretariat of Economic Affairs of Mexico (strategic programme for the automotive industry 2012-2020; sector promotion programme (PROSEC); and decree to support the competitiveness of the vehicle final assembly industry and the development of the domestic car market) and by the National Council for Science and Technology (CONACYT) (innovation agenda for the north central region 2013-2018; special programme for science, technology and innovation 2014-2018 [PECITI]; innovation incentive programme [PEI]; and strategy to address technological demands from the automotive industry [ECATI]).

2. The electronics industry: a multisector technological enabler

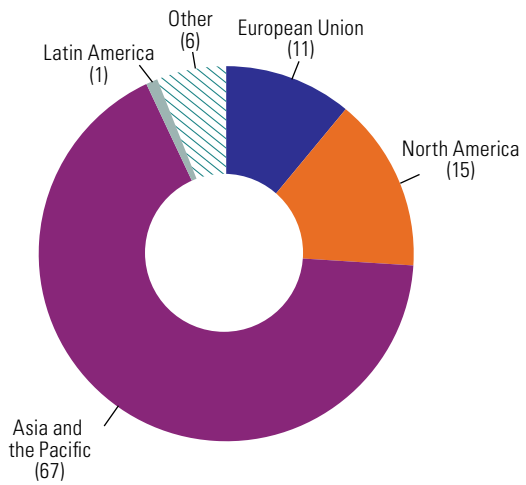
(a) New applications extend the frontiers of the global electronics industry

Electronics is one of the fastest growing and most competitive industries in the world and innovation and technological development in the industry are key to companies' leadership and continuance in the market. A factor increasing this sector's relevance is its convergence with the automotive, aerospace and many other industries. As a result, the electronics industry is evolving from a vertical structure of specific applications into a multisector technological enabler. This is creating huge growth opportunities in terms of the market value and diversity of manufactured goods.

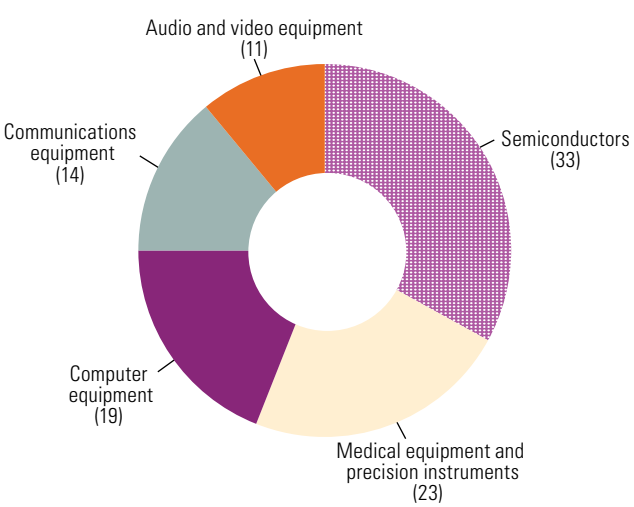
In recent years, the electronics industry has maintained steady growth, interrupted only by the 2008 global financial crisis, and growth is expected to continue in the near future. At present, 67% of global production is concentrated in the Asia and Pacific region (China, Japan, Taiwan Province of China and Republic of Korea) where the world's leading manufacturers are located. Lagging far behind are North America (15%), including Mexico, and the European Union (11%) (see figure II.16A).

Figure II.16
Global production by the electronics industry, by region of production and type of product, 2014
(Percentage of the value of production)

A. By region of production



B. By type of product



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from IHS Markit.

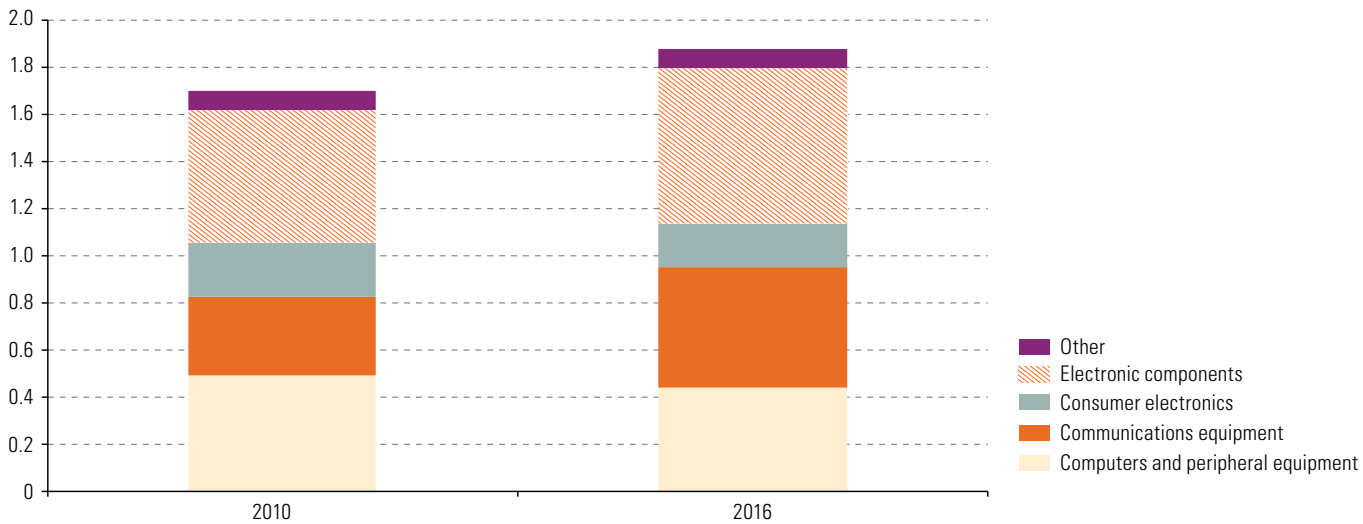
In terms of products, the most important segment is semiconductors, accounting for 33% of global production (see figure II.16B). Semiconductors are the basis for the development of any electronic device, including computers and telecommunications, audio and video equipment. In 2017, the Republic of Korean firm Samsung and the United States firm Intel largely dominated the global semiconductor market.

In contrast to the oligopolistic structure of the semiconductor manufacturing industry, in the electronics industry there tends to be a highly fragmented model of production, where parts and components may be manufactured in a variety of countries before being assembled for sale to the end consumer. This enables the industry to offshore segments of the value chain to low-cost destinations, which has created opportunities for a number of developing economies.

Leading original equipment manufacturers and specialist electronics manufacturing service providers are seeking not only to improve their efficiency by locating production in low-cost destinations but also to cash in on the consumer boom in emerging economies. These strategies are being deployed in the production of computer equipment, consumer electronics and telecommunications devices, as well as in more specialist areas (including medical and aerospace equipment, robotics, and machinery and equipment). In specialist areas, where products are more sophisticated and production volumes are low, there is a tendency for both emerging economies and mature markets to manufacture in, or close to, the end market.

Between 2010 and 2016, exports from the global electronics industry increased by US$ 1.70 trillion to US$ 1.88 trillion.[9] In 2016, electronic components, chiefly semiconductors, accounted for 35% of total exports from the electronics industry, followed by communications equipment (27%), computers and peripheral equipment (23%) and consumer electronics (television sets and other audio and video equipment) (10%) (see figure II.17).

Figure II.17
Global exports from the electronics industry, by product family, 2010 and 2016
(Trillions of dollars)

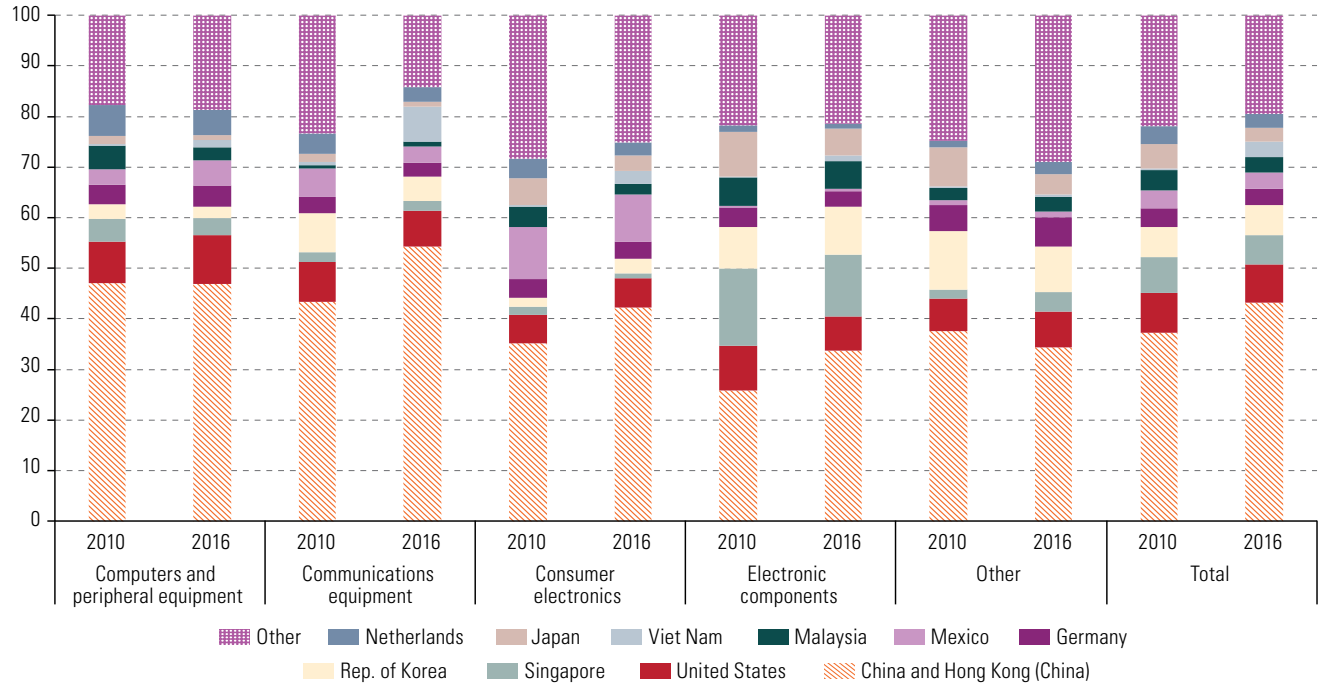


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

Global exports are concentrated heavily in a small group of economies. In fact, just 11 economies are responsible for over 80% of all these trade flows: 7 in Asia (China, Hong Kong [Special Administrative Region of China], Singapore, Republic of Korea, Malaysia, Viet Nam and Japan); 2 in North America (United States and Mexico); and 2 in the European Union (Germany and the Netherlands). In 2016, China and Hong Kong (China) were the top exporters in all product families, with these economies being responsible for 43% of global exports from the electronics industry and largely dominating exports of communications equipment (54% of the total) and computers and peripheral equipment (47% of the total). The United States ranked second in all product categories, except electronic components, where Singapore and the Republic of Korea exported more (12% and 9% of all electronic components, respectively) (see figure II.8).

[9] Although statistics for the electronics industry follow international methodological conventions, they have significant limitations when it comes to quantifying such a fast-growing industry as electronics, which is becoming more and more integrated with other sectors, like the automotive industry that, in the past, were considered to be independent.

Figure II.18
Global exports from the electronics industry, by product family and country of origin, 2016
(Percentage of the export value)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

In terms of imports, China and Hong Kong (China) are also the main destination market for electronic goods. In 2016, they were the destination for 32% of global imports of electronic goods and ranked first in all product families, except computers and peripheral equipment and consumer electronics, where the most important market was the United States. This highlights the intensive intraregional trade taking place in this industry's global value chains, particularly in Asia and the Pacific and North America.

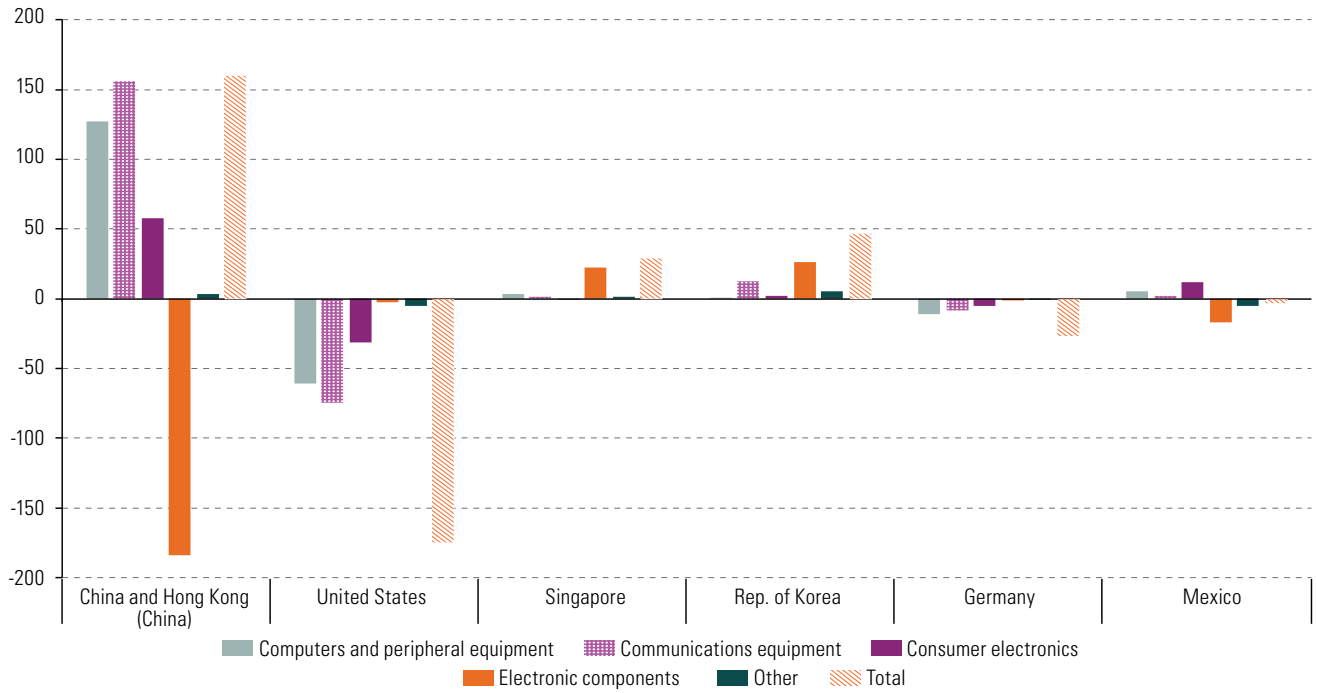
In 2016, China and Hong Kong (China) maintained a surplus in international trade in all electronic goods, despite posting a large trade deficit in electronic components, mainly semiconductors (see figure II.19). However, this situation could be reversed as a result of the large investments being received by Mexico in the area of semiconductors, particularly for the manufacture of wafers (SEMI, 2018). China is currently the world's biggest consumer of semiconductors, with a market share of close to 60%, and has around 13% of global production capacity (PwC, 2017a).

By contrast, the United States has a large trade deficit in the electronics industry both overall and in each of its main components (see figure II.19), which was largely responsible for the recent measures announced by the United States Government to impose tariffs on a number of Chinese products, including some electronic goods, such as televisions and parts (*The Washington Post*, 2018).

As in the autoparts industry, the production chain in the electronics industry is organized into tiers. Tier 4 comprises basic or generic inputs, such as metals, resins and chemical materials. Tier 3 comprises semi-finished products made from tier 4 inputs and is generally characterized by highly specialized processes. Tier 2 production is based on the above elements and includes the manufacture of electronic components that are largely classified as basic commodities for the sector. Tier 1 includes direct supply to manufacturers or final assembly plants. It is common for some tier 1 operations to be carried out directly by manufacturers or final assembly plants, which are specialist

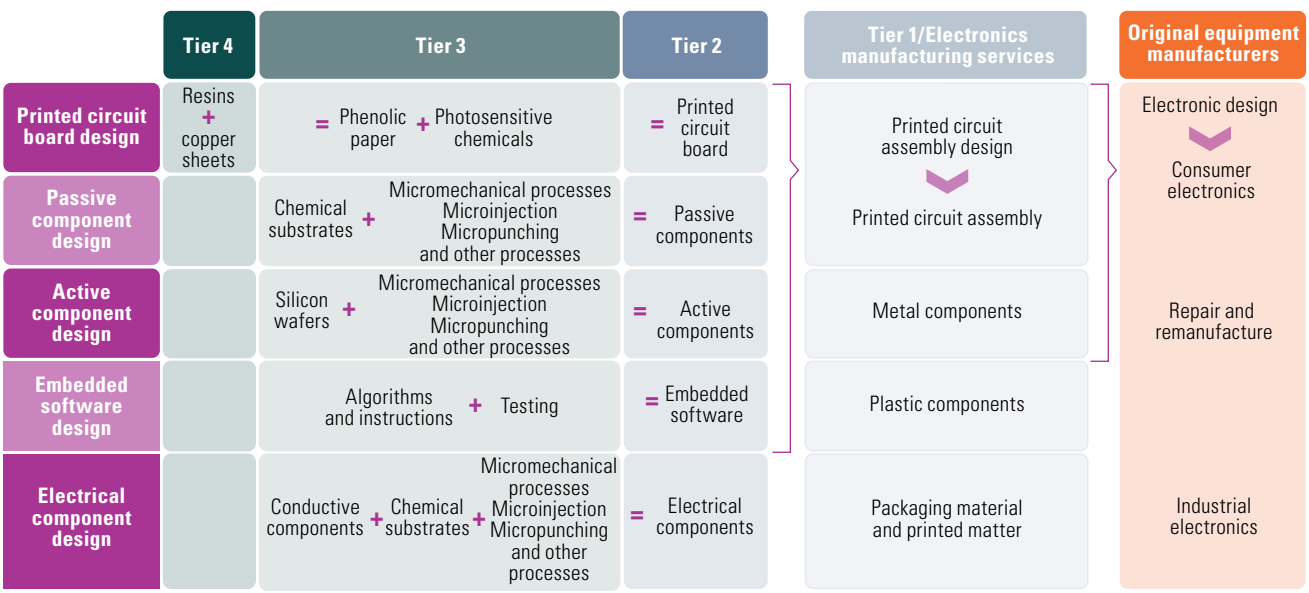
electronics manufacturing service providers. The top segment in the production chain is dominated by original equipment manufacturers, which are in charge of designing and developing new products and final manufacture. This segment ties in with the extended value chain that includes distribution and marketing (CANIETI, 2017) (see diagram II.5).

Figure II.19
Selected countries: trade balance in the electronics industry, 2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

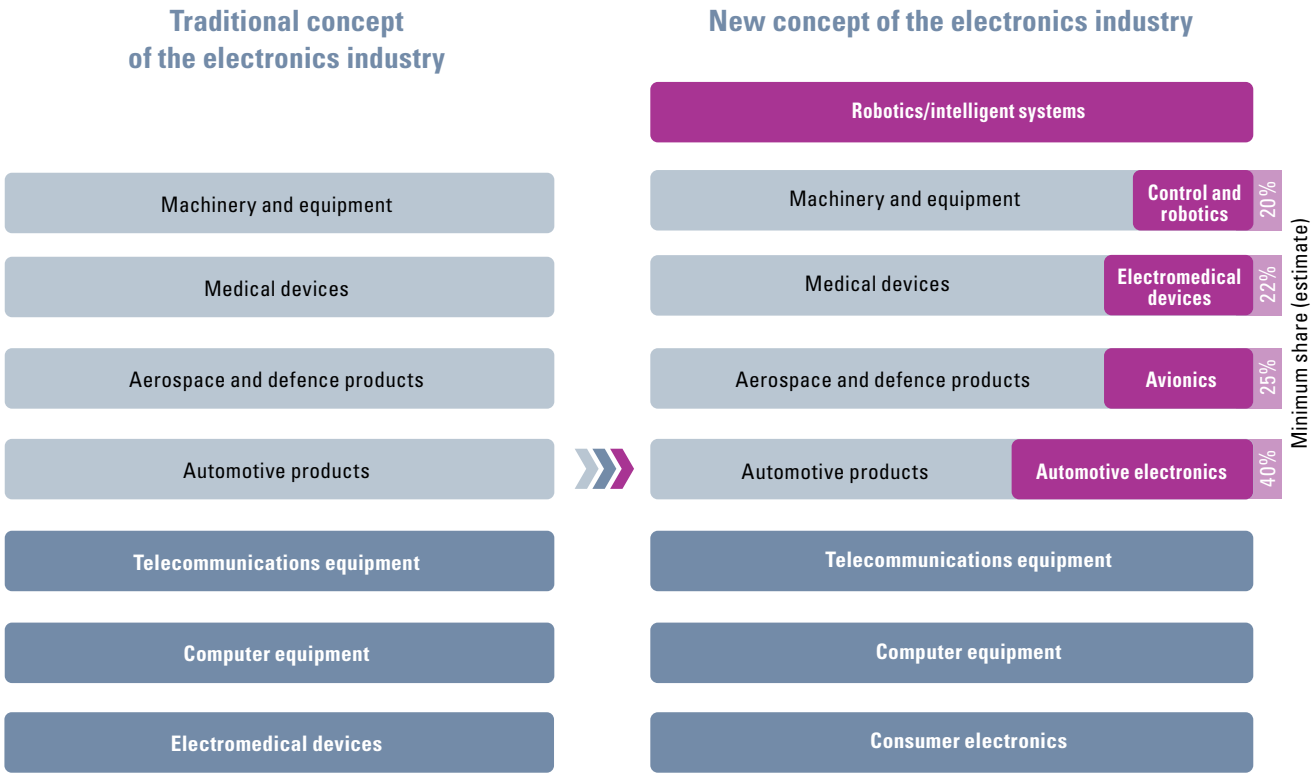
Diagram II.5
Production chain in the electronics industry



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of ProMéxico, *Diagnóstico sectorial: la industria electrónica*, Mexico City, 2016.

In the electronics industry, manufacturing is evolving all the time. Constant restructuring of the roles of the different agents takes place all along the chain. In addition, rapid technological change and convergence has created myriad new applications covering virtually all areas of economic activity and daily life, forcing companies in the sector to redefine their business models continually (see diagram II.6).[10]

Diagram II.6
Transformation of the electronics industry



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of ProMéxico, *Diagnóstico sectorial: la industria electrónica*, Mexico City, 2016.

The standardization and modular nature of its components have made electronics one of the world's most globalized industries. The expansion of global value chains has resulted in a complex web of relationships between different production networks, some of which show a high level of geographic concentration.

The manufacture of electronic components and goods has been concentrated in Asia. Assembly operations tend to be located close to end-consumer markets. There is widespread use of production outsourcing models, whereby leading companies in the design and development of new products, which have no manufacturing base, seek to position themselves at the two extremes of the global value chain: R&D and marketing. Finally, while countries such as Japan and the Republic of Korea dominate with brands in consumer electronics, Taiwan Province of China and China specialize in contract manufacturing for American and Japanese brands, particularly computers and mobile phones (ILO, 2014).

[10] The increasingly cross-cutting nature of the electronics industry, stemming from technology convergence in hardware, software and telecommunications, development of the Internet of Things and Industry 4.0, is making it ever more difficult to quantify the industry's value. It is estimated that: 40% of the value of a car comes from electronic components and software; at least 25% of the value of an aircraft comes from avionics; around 22% of the market value of medical devices in general comes from electromedical devices; and more than 20% of the market value of machinery and equipment comes from control, robotics and automation elements (CANIETI, 2017).

Electronics companies use a variety of strategies to shape their supply chains. At one extreme there are companies that seek to strengthen their production structure through vertical integration, and, at the other, those that concentrate exclusively on activities where they can leverage clear competitive advantages, economies of scale and value creation.

A prime example of a company in the first category is Samsung in the Republic of Korea, which is using a strategy of vertical integration to increase control over the competition and the activities of intermediaries along the supply chain, reducing its dependence on the latter. In the mid-1990s, Samsung focused on consumer electronics, while continuing to grow its semiconductor and memory businesses, and invested heavily in new technologies. After consolidating its advantages in the component production market, Samsung has quickly positioned itself as a manufacturer of high-quality consumer goods (Brostoff, Levin and Bowers, 2014). Samsung is now the world's leading developer and manufacturer of high-definition liquid-crystal-display (LCD) televisions, smartphones and semiconductors (Samsung, 2017). In 2017, the company invested 7.7% of its sales revenue in R&D, consolidating its position as global leader in several products and global supplier for other tier 1 companies, such as Apple, Sony and Hewlett Packard. Samsung's R&D spending is the fourth highest in the world, after Volkswagen, Google and Microsoft, totalling 12.155 billion euros in 2017 (European Union, 2017). This has earned it the ranking of second biggest assignee, after IBM, for the number of patents granted in the United States (5,837 in 2017) (IFI, 2018).

As of the end of 2016, Samsung Electronics maintained 220 worldwide operation hubs, including manufacturing subsidies (38), sales subsidiaries (53), design centres (7) and R&D centres (34) (Samsung, 2017). It maintains most of its manufacturing operations in Asia: in China (12 plants), the Republic of Korea (5) and other countries (10). The company manufactures 90% of its products within its own network of subsidiaries (Dudovskiy, 2017). However, the company's supply chain includes some 2,500 suppliers, and 80% of its expenditure is concentrated in tier 1 and tier 2 companies in Asia. For Samsung, strategic relationships with suppliers have been one of the main sources of value creation, and it has implemented a range of financial, technological and operational support mechanisms for its suppliers.

Standing in contrast is a company like Apple, widely known for its technological innovations and exponential growth. In addition, Apple is acknowledged to have one of the best supply chains in the world (Gartner, 2017). At the outset, Apple believed that software and hardware development and production should be closely integrated. However, poor results in the mid-1990s forced the company to embark on an intensive process of outsourcing. Today, the United States firm focuses on designing and marketing new products and it has transferred the manufacturing and assembly of its devices, such as smartphones, tablets, computers and watches, to a complex network of suppliers around the world.

Currently, Apple sells products that are assembled by specialist manufacturing service providers using dozens of parts originating from different suppliers. For the latest model of its most profitable product, the Iphone X, Apple uses more than 200 suppliers from around the world, mainly Asia (see diagram II.7). Final assembly is carried out exclusively by a specialist manufacturing services provider in Taiwan Province of China, called Foxconn (*The New York Times*, 2016).

Diagram II.7
Main components and number of suppliers of Apple's iPhone X, 2018

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of PhoneArena, "The X is a Frankenphone, see how Apple makes or breaks the fortunes of its suppliers", 20 December 2017 [online] https://www.phonearena.com/news/The-X-is-a-Frankenphone-see-how-Apple-makes-or-breaks-the-fortunes-of-its-suppliers_id100935.

Since the technological revolution hit the telecommunications industry, competition has increased enormously, intensifying investment and innovation and extending the frontiers of the digital economy. Consumer electronics manufacturers are incorporating the Internet of Things technology to improve product features and provide a more convenient and use-friendly customer experience.[11] Some manufacturers, including Samsung and LG, are introducing such features more and more widely. It is estimated that 10% of households in the United States will be smart by 2025 (IHS Markit, 2017b). The value of the global smart homes market is expected to increase from US$ 35.7 billion in 2018 to US$ 150.6 billion in 2023 (Orbis Research, 2018). Demand for smart televisions is also rising sharply, driven by increasing Internet penetration and the changing preferences of consumers, who are demanding that smart features (connectivity, multifuncionality) be incorporated into personal devices. Between 2015 and 2019, the smart television share of all devices is set to increase from 19% to 32% (Statista, 2017). The miniaturization of electronic devices will also continue to open up new opportunities and to pose challenges for the industry, such as the development of medical equipment niches.

Fierce competition and rapid technological change are forcing electronics companies to review their production, technology and business strategies constantly. In a context where product life cycles are becoming ever shorter and more and more electronics are being integrated into almost all activities, differentiation is achieved by accelerating the inclusion of a set of improved and more affordable elements, such as sensors, software, user interfaces, connectivity and artificial intelligence, which facilitates digitization in a wide range of applications. This is creating a paradigm shift: from a vertical industry to a sector conceptualized as a cross-cutting enabler.

(b) Mexico: a low-cost segmentin the electronics industry's global value chains

The origins of Mexico's electronics industry date back to the 1970s, when several public policies were introduced to stimulate economic activity in northern Mexico. As mentioned earlier, this led to the expansion of a model based on the temporary importation of inputs for processing or assembly prior to being exported in the form of a finished or semi-finished product, all in exchange for creating jobs and securing foreign exchange.

After signing NAFTA, trade and FDI flows began to increase, one result of which was to encourage offshoring of Asian companies seeking to increase regional content to supply the United States market. NAFTA provided preferential access to imported parts and components at competitive prices, stimulating growth in the consumer electronics segment.

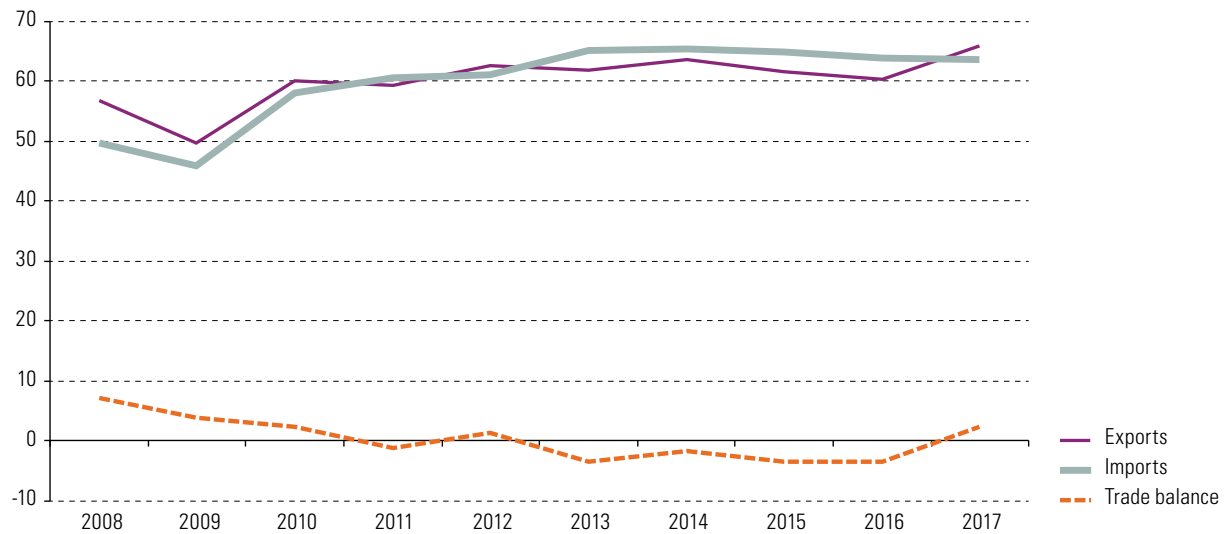
The Mexican city of Tijuana became the television capital of the world, for many years recording the world's highest production. In the early 2000s, televisions were Mexico's main export product, outperforming the automotive sector. Currently, around a dozen or so of the industry's most important firms, including LG and Samsung, produce some 20 million television sets a year in Mexico. However, the industry has made little headway in terms of value added in exports. The majority of activities carried out in Mexico involve assembly and sub-assembly. Lack of continuity in public policy has hindered substantive progress with local capacity-building in support of technological progress and further production integration.

[11] The Internet of Things provides for interconnection between objects and physical devices that are integrated with sensors and software in order to facilitate the exchange and collection of information. The number of connected Internet of Things devices worldwide is forecast to jump from 27 billion in 2017 to 125 billion in 2030 (IHS Markit, 2017a).

Mexico's special conditions attracted huge inflows of FDI into the electronics industry, with the result that a large proportion of the sector's production base is foreign in origin. Between 1999 and 2017, Mexico received some US$ 20 billion for the electronics industry (7.8% of the country's entire manufacturing FDI). The most important segments for FDI were the manufacture of communications equipment (26%), computers and peripheral equipment (24%), electronic components (21%) and audio and video equipment (19%). Over the same period, the majority of Mexico's FDI came from the United States (64%), followed by Japan (16%) and the Republic of Korea (3%) (Secretariat of Economic Affairs of Mexico, 2018b).

Promotion programmes, NAFTA and the massive influx of foreign companies boosted international trade in electronic goods. Between 2008 and 2017, exports and imports performed much the same, both remaining at around US$ 60 billion (see figure II.20). Consumer goods, such as computers, mobile phones and televisions, posted a large trade surplus, which was on the wane in the case of televisions. Electronic components is the segment that makes the biggest contribution to the electronics industry's deficit (totalling nearly US$ 20 billion in 2017).

Figure II.20
Mexico: exports, imports and trade balance of electronic goods, 2008–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

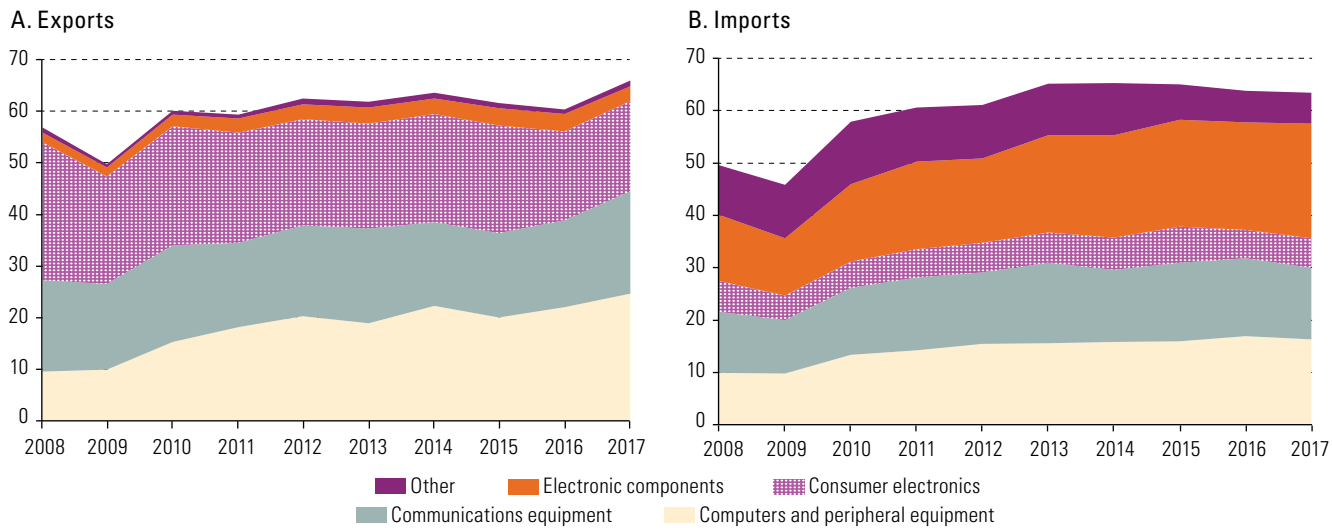
Foreign trade in the electronics industry is a reflection of production specialization oriented towards the export of finished goods. In recent years, more than 90% of exports have consisted of computers and peripheral equipment, communications equipment and consumer electronics (chiefly televisions), in roughly equal proportions. Imports consist mainly of electronic components (semiconductors), which are incorporated into products for export and into foreign-made high-tech equipment destined for the domestic market (see figure II.21).

In all product categories, the United States is by far the top destination for exports from Mexico's electronics industry, accounting for around 85% of the total. Imports come mostly from Asia, with the main countries of origin being China and Hong Kong (China). In the case of electronic components, imports come from a larger number of countries, including China and Hong Kong (China) (31%), Malaysia (22%) and the Republic of Korea (9%). The United States is a major country of origin for imported

consumer electronics (26%) and communications equipment (13%) (see figure II.22). In short, the trade dynamic confirms an orientation towards the export of finished goods and assembled electronic boards for the United States market, with inputs chiefly from Asia (components, semiconductors and printed circuit boards).

Mechanical components (plastic parts, metal and packaging) and the support services required by Mexico's electronics industry are provided locally, with suppliers present in the Mexican states where the industry is located, along with some suppliers from the United States, given the two countries' geographical proximity and business-to-business relationships.

Figure II.21
Mexico: exports and imports in the electronics industry, by product family, 2008–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).
Note: Product families have been defined on the basis of the Harmonized Commodity Description and Coding System.

Figure II.22
Mexico: destination and origin of exports and imports in the electronics industry, by product family, 2017
(Percentages)

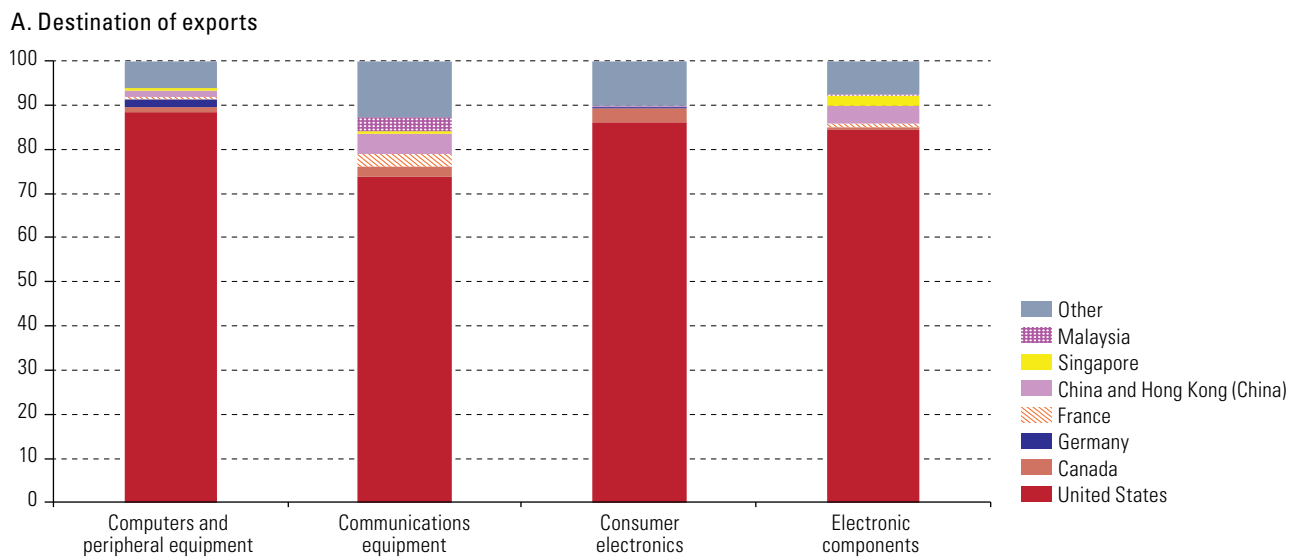
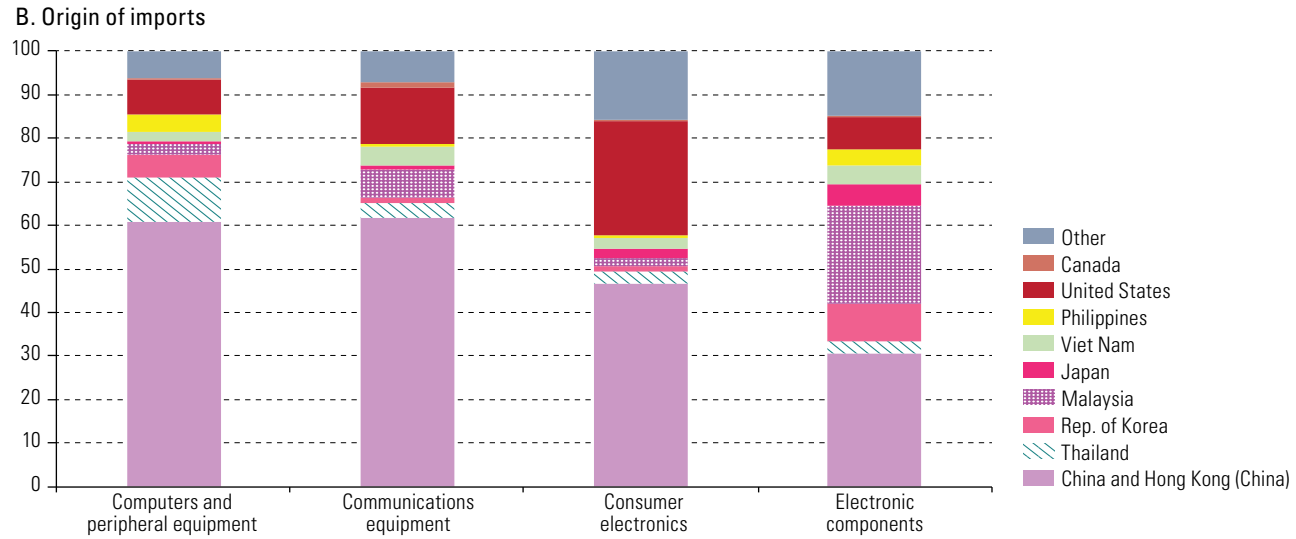


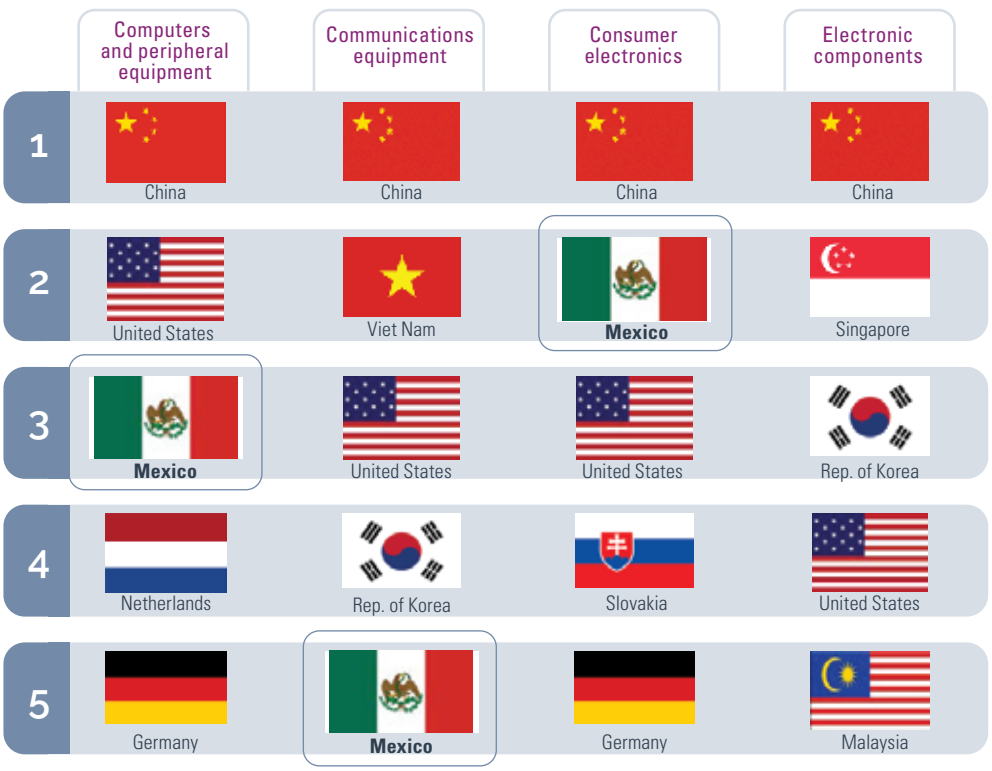
Figure II.22 (concluded)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).
Note: Product families have been defined on the basis of the Harmonized Commodity Description and Coding System.

In Mexico, electronic goods manufacturing is quite diversified and has gained a prominent position in the industry's top segments. Mexico is the world's second largest exporter of consumer electronics, of which television sets account for 77%. The country is also the world's third largest exporter of computers and peripheral equipment (after China and the United States) and the fifth largest exporter of communications equipment. Mexico is the fourteenth largest exporter of electronic components, a long way behind seven Asian countries (China, Singapore, Republic of Korea, Malaysia, Japan, Thailand and Viet Nam) (see diagram II.8).

Diagram II.8
Ranking of the leading electronic goods exporting countries, 2017



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

Despite these commercial successes, Mexico's electronics industry is positioned in the final-product segment of the global value chain, especially in: the assembly of intermediate parts and components ; the final assembly of consumer goods; and testing, quality control and packaging. In Mexico, the industry is composed mainly of original equipment manufacturers (which carry out final assembly) and manufacturing services (which carry out large-scale manufacturing for original equipment manufacturers, suppliers and electronics manufacturing service providers). In most cases, transnational electronics companies have excluded Mexico from research, development, innovation and new product design activities. Even though electronics companies are distributed across the country, there is a high concentration of companies at Mexico's northern border, mainly in the states of Baja California, Tamaulipas and Jalisco (see maps II.3 and II.4).

Map II.3
Leading electronics companies with operations in Mexico, by segment and geographic location, 2017

A. Computers and peripheral equipment, communications equipment and medical equipment

B. Consumer electronics: audio and video equipment

Map II.3 (concluded)

C. Electronic components

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of ProMéxico, *Diagnóstico sectorial: la industria electrónica*, Mexico City, 2016.

Map II.4
Leading electronics manufacturing service providers with operations in Mexico

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of ProMéxico, *Diagnóstico sectorial: la industria electrónica*, Mexico City, 2016.

There are very few firms in Mexico's electronic components segment, including semiconductors, and demand from manufacturers of final goods cannot be met domestically. An estimated 97% of the electronic components used in Mexico's industry are imported (ProMéxico, 2014). The lack of high-tech suppliers required by Mexican industry is evident from the structure of imports (see figure II.21B). The high investment requirements, coupled with some technical constraints, make it difficult to strengthen segments involved in the production of passive and active components, such as semiconductors.

In fact, the value added by manufacturing activities within global value chains in the electronics sector is extremely low. While the value added by global companies in vehicle production is 22.5%, in the manufacture of computers and peripheral equipment it is 2.2%, in communication equipment it is 1.1%, in consumer electronics (audio and video equipment) it is 3.1% and in electronic components it is 3.6% (INEGI, 2017).

Government authorities, mainly through the Secretariat of Economic Affairs of Mexico and ProMéxico, have endeavoured to implement supplier development programmes, based primarily on business networking, without much success. Moreover, the country has no structured programme for supplier development, upgrading of technological expertise and production chain integration. However, the following Mexican states have engaged in some interesting initiatives.

- In the state of Baja California, despite previous lack of success,[12] a recent law was passed to promote supplier development in the State of Baja California. This initiative, which enjoyed the support of the National Chamber of the Processing Industry (CANACINTRA), grants incentives to the manufacturing industry to integrate Mexican companies into production chains in all sectors, including electronics. At present, 97% of the inputs used by Baja California's export companies are imported (*El Economista*, 2018).
- In the state of Jalisco, a long-standing electronics supply chain programme (CADELEC) provided a support centre to manage institutional funds and investment promotion mechanisms. The programme was successful in integrating local suppliers of inputs and services into the chains, fostering start-ups and business networking events. Technical assistance programmes were implemented to build capacity. After two decades in operation, the CADELEC programme is now being redesigned.

To sum up, the electronics industry is one of Mexico's most dynamic manufacturing sectors, as a result not only of structural changes but also of technological change and shorter product life cycles. This dynamic will undoubtedly impact on Mexican industry, although it is hard to say how much. This makes it important to identify existing capabilities and gaps in Mexico's industry with respect to the technological frontier, in order to promote a well-structured and financed strategy of specialization that leads to the creation of new competitive advantages aligned with the deployment of today's disruptive technologies.

[12] The electronics industry productivity centre of Baja California (ProduCen) was in operation from 2000 to 2007, tasked with developing production chains in the electronics sector. However, the strong presence of Asian companies with international supply chains and, in some cases, subsidiaries of transnational companies, left no room for developing domestic suppliers, which were judged to have limited technical expertise and to be small-scale and non-price competitive.

3. The aerospace industry: carving out a space in a sector dominated by a few players

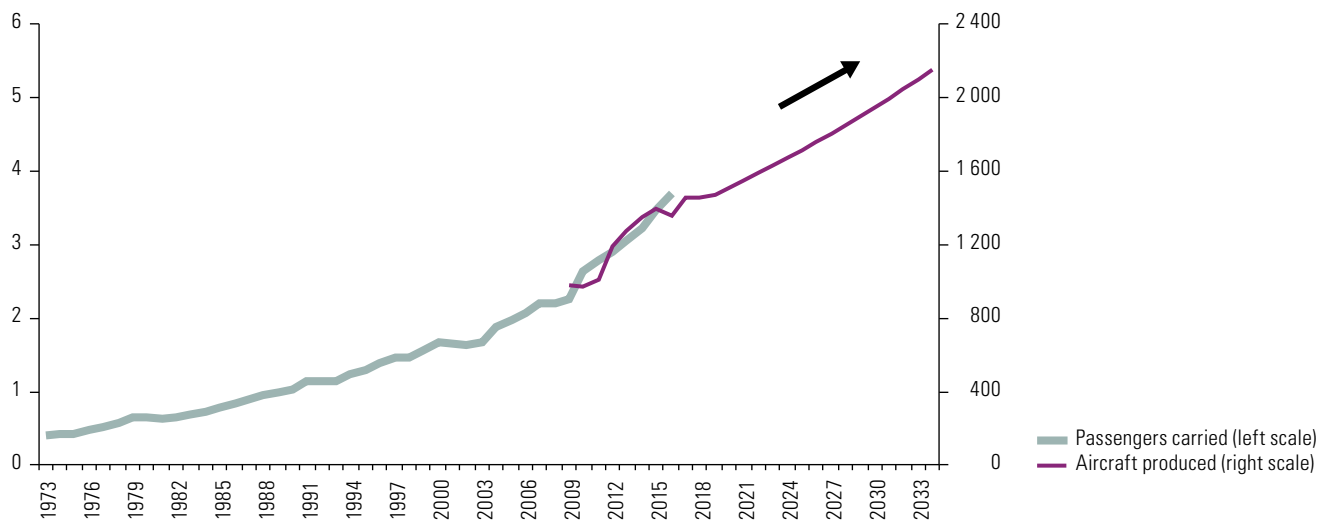
(a) Creation of global value chains firmly rooted in developed countries

In recent decades, growth in the aerospace industry has been strong. Between 2011 and 2016, the industry's revenues, including the defence segment, increased from US$ 570 billion to US$ 674 billion (Deloitte, 2017a). This has stemmed mainly from airline demand for new aircraft, driven by two main factors:

(i) The need to update the aircraft fleet by bringing in newer aircraft. The useful life of a commercial aircraft is determined chiefly by safety considerations. There are rigorous overhaul programmes designed by manufacturers, strict compliance with which is a prerequisite for maintaining flight permits. However, this is not the airlines' only consideration when deciding to replace their aircraft. Some of the most important reasons are: fuel consumption efficiency, environmental impact, new passenger services and features (such as screens and Wi-Fi) and the need to safeguard an airline's image and reputation.

(ii) The need to increase the aircraft fleet to meet rising demand for air travel. Between 1973 and 2016, the total number of passengers carried by airlines worldwide grew from 402 million to 3.6 billion (see figure II.23).

Figure II.23
Passengers carried by airlines and aircraft production worldwide, 1973–2033[a]
(Billions of passengers and units manufactured)



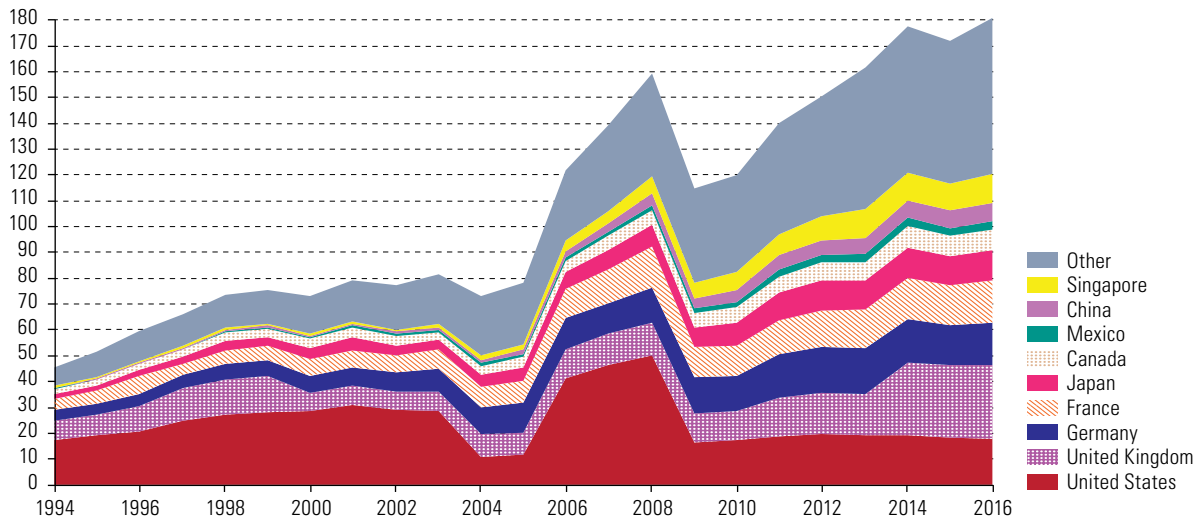
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Deloitte, "2017 Global aerospace and defense sector financial performance study", London, 2017 [online] https://www2.deloitte.com/content/dam/Deloitte/global/Documents/consumer-industrial-products/gx-cip-global-aerospace-defense-financial-performance-study.pdf.

[a] The figures for 2018 to 2033 are estimates.

These two factors augur well for the industry's future. In fact, aircraft production is expected to continue to increase steadily to meet growing demand, at least for the next two decades. The prospects are favourable not only for big aircraft assembly companies but also for all those involved in a product, process or service along the global value chain.

As the aerospace industry began to incorporate the global value chain rationale and to fragment the production process while stepping up aircraft production, international trade in parts and components for aircraft construction also began to grow. This process has been dominated by a small group of advanced countries: the United States, the United Kingdom, Germany, France and Japan (see figure II.24).

Figure II.24
Global exports of parts and components for the aerospace industry, main exporting countries, 1994–2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

Large commercial passenger aircraft are very complex products made up of millions of different parts and components. Consequently, global value chains in the aerospace industry are also extremely complex and, perhaps because of this, they are evolving constantly.

Over recent decades, global value chains in aerospace production have been changing in a number of respects. As a result of these changes, the costs and risks of developing new aircraft have become less and less centralized, which, indirectly, has opened up a window of opportunity for developing countries (Bamber and Gereffi, 2013).

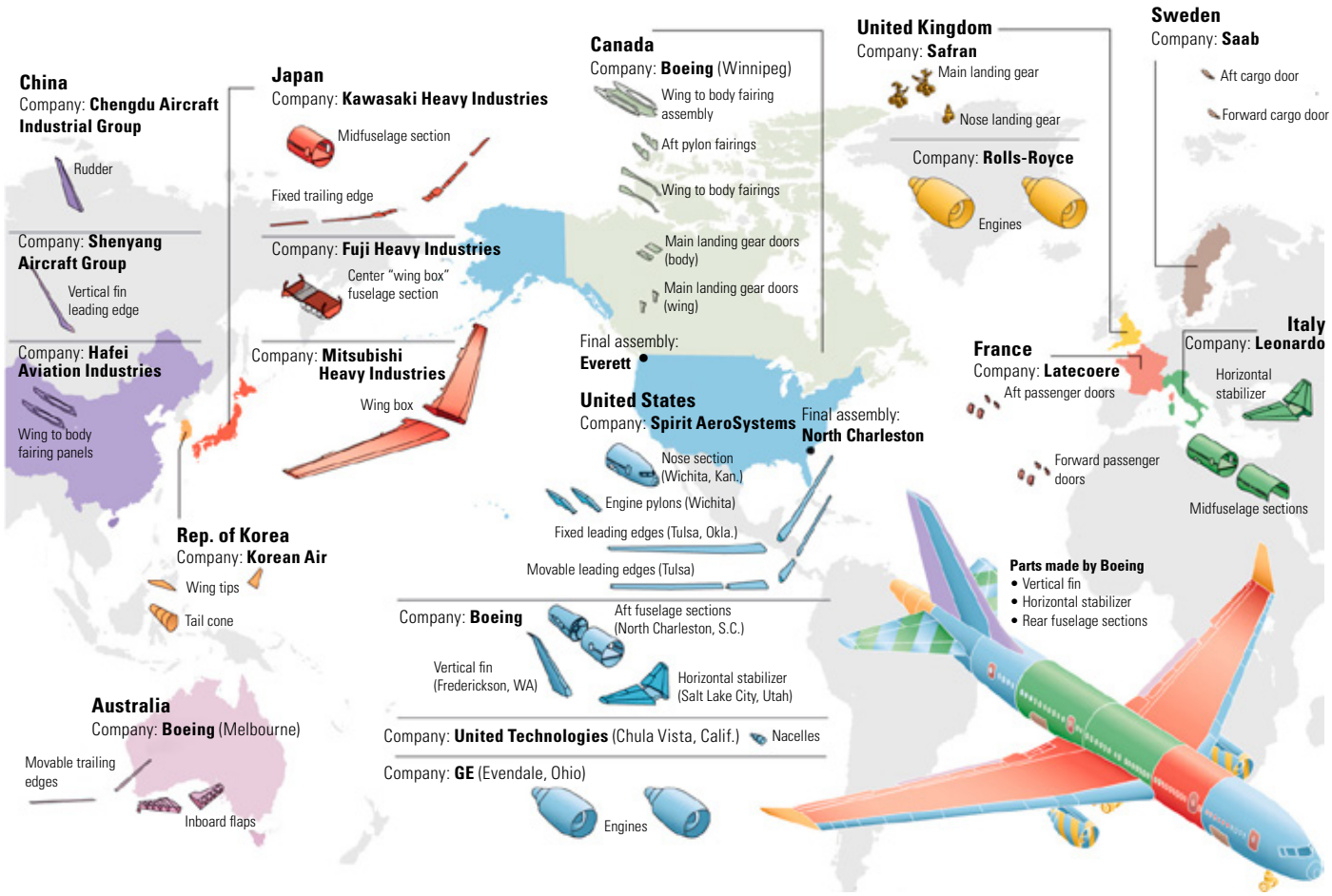
The production process has become increasingly fragmented. Three decades ago, the industry was highly integrated and, at the same time, eminently hierarchical. In the main, aerostructures, aircraft systems, interior parts and components were produced in-house by the lead firm, with the result that final assembly lines were supplied mainly from within (Michaels, 2017a). Original equipment manufacturers produced 80% in-house and outsourced the remaining 20% to external suppliers, over which they exercised strong control.

In the early 1990s, a tiered supply chain model began to prevail, just as in other industries. This strategy was pioneered by the Canadian firm Bombardier and later replicated by other large companies in the industry, such as Boeing, Airbus and Embraer (Michaels, 2017a). According to this model, original equipment manufacturers are responsible for aircraft design, systems-integration (fuselage, wings, engine, landing gear, hydraulics, avionics devices, electrical power supply and interior systems), final assembly and marketing (Bamber and Gereffi, 2013). However, systems manufacturing is transferred to tier 1 suppliers, which,

in turn, have to coordinate with suppliers in the subsequent tiers (tiers 2 and 3) to meet their own needs. Tiers 2 and 3 have to supply subsystems (fuselage sections, turbines and avionics devices) and specific components (such as electronic circuit boards, hydraulic pumps, motors and controls) to original equipment manufacturers or tier 1 suppliers. Lastly, tier 4 suppliers provide relatively low value-added commodity parts (such as pistons, gaskets, rivets and screws), as well as supplying raw materials. As a result of these new production arrangements, outsourcing in the aerospace industry has risen to over 65% of value added (Michaels, 2017b).

On the other hand, the geography of production has become increasingly dispersed and global. Whereas, in times past, most suppliers were located in the same place as the aircraft manufacturer, now it is common for them to be located in another country. The Boeing 787 Dreamliner is an example of production fragmentation and globalization in the aerospace industry (see diagram II.9).

Diagram II.9
Boeing 787 Dreamliner: main suppliers, by system and geographic origin, 2017



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of *The New York Times,* "Boeing backs 'border adjustment' tax overhaul, though critics fear it could stir up trade wars", 8 April 2017 [online] https://www.seattletimes.com/business/boeing-aerospace/boeing-backs-border-adjustment-tax-overhaul-though-critics-fear-it-could-stir-up-trade-wars/.

Competition and pressure to cut production costs has made many companies in the sector, especially those in lower tiers, more price-sensitive to suppliers. This has created opportunities for new suppliers in low-cost areas to enter the value chain and for suppliers already in the chain to increase their relevance. Several developing

countries have moved to take advantage of these new conditions by seeking to attract FDI, with its associated transfer of sophisticated technologies and creation of high-level jobs (Bamber and Gereffi, 2013).

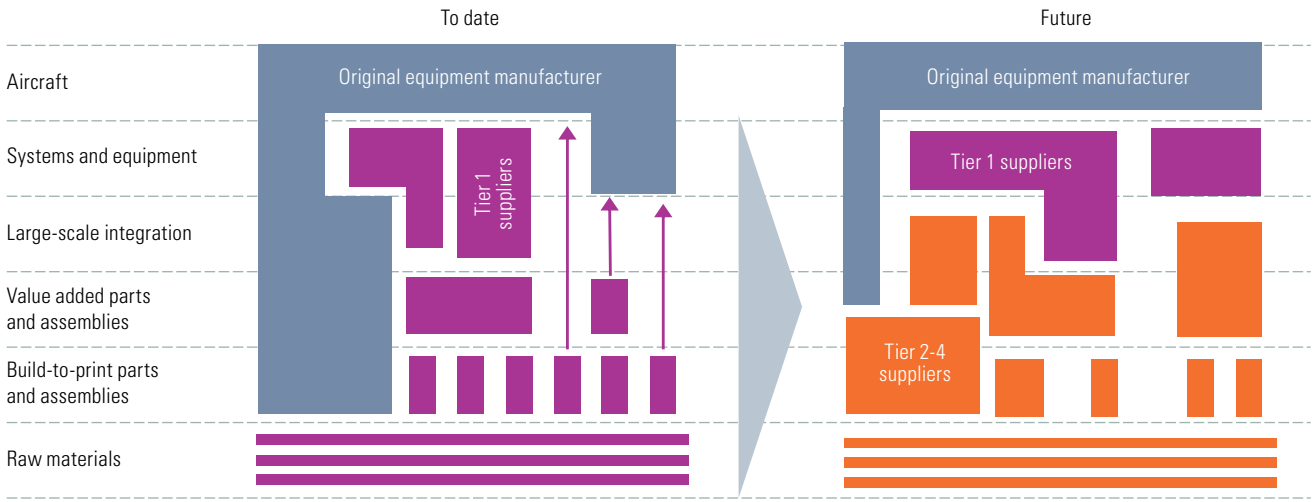
However, despite the evident cost advantages, the aerospace industry's push into emerging markets has been relatively slow and the industry continues to be strongly rooted in the advanced economies of North America, the European Union and Asia (Bamber, Frederick and Gereffi, 2016). Currently, the most attractive locations for expanding aerospace manufacturing activities are the United States, Switzerland, the United Kingdom, Australia and Canada (PwC, 2017b). In the case of the Boeing 787 Dreamliner, all systems are manufactured in developed countries (Australia, France, Italy, Japan, Sweden, United Kingdom and the United States), with the exception of China and the Republic of Korea (see diagram II.9). In fact, only about 3% of the aerospace industry's output originates in emerging countries (Bédier, Vancauwenberghe and Van Sintern, 2008).

Finally, there has been a process of consolidation in the global aerospace industry, around a small group of lead firms in key activities of the production chain.

In their quest to streamline supply processes in the chain, major aircraft manufacturers, such Airbus, Boeing, Embraer and Bombardier, outsourced non-core capabilities (including design and R&D tasks) to a small number of direct suppliers and began to step up their demands. The aim was to reduce costs, share risks and minimize the challenges involved in supplier management (Bamber and Gereffi, 2013; Niosi and Zhegu, 2005). These developments obliged aircraft-component manufacturers (tier 1 suppliers) to consolidate and create a new breed of supplier aligned with their own needs (Michaels, 2017a).

The operation of these consolidated supplier chains therefore began to depend more and more on sophisticated and expensive technology platforms developed by the lead firms and a tiny group of aircraft manufacturers and tier 1 suppliers (see diagram II.10). The structure described above, coupled with low production volumes and high regulatory costs (strict safety certification), help to explain the persistence of the aforesaid technological and financial barriers to the entry of new actors into the different activities in the chain.

Diagram II.10
Value chain in the aerospace industry



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Supply Chain Excellence Initiative (SCE), *Supply Chain Excellence in the German Aerospace Industry,* 2017 [online] http://www.german-aerospace.de/wp-content/uploads/2015/08/2017_07_25-Studie-SCE-2017-EN.pdf.

The past decade has been characterized by fierce competition, giving rise to a flurry of mergers and acquisitions, chiefly among tier 1 suppliers, which has progressively reduced the number of stakeholders within the industry, deepening the trend towards consolidation. The wave of mergers and acquisitions in the aerospace industry in recent years has been particularly intense among smaller firms, which have sought to counteract price-reduction pressure on suppliers from large manufacturers, as well as to access new technologies to allow these smaller firms to remain competitive (PwC, 2018).

Examples include the acquisition in 2015 of Precision Castparts Corp. by Berkshire Hathaway for US$ 35.8 billion (the biggest acquisition in the history of the aerospace industry) and that of aircraft parts manufacturer Rockwell Collins by jet engine manufacturer United Technologies Corporation for US$ 30.2 billion, in 2017 (Reuters, 2017a and 2015). In the future, the aerospace supply chain is expected to continue on this trajectory of change, designed to cut costs, respond more rapidly to market requirements and step up investment in product innovation (Deloitte, 2018).

However, in some instances there has been a shift in the opposite direction, that is to say, a return to greater vertical integration. For example, Boeing stopped outsourcing the manufacture of wings for its 777-X aircraft (Bloomberg, 2018). A number of factors explain these new developments: (i) Boeing's bad experience with supply for its 787 aircraft; (ii) disruptive technologies, including additive manufacturing, advanced automation and digital manufacturing, which began to change the purchasing equation of original equipment manufacturers as the relevance of labour in production processes progressively diminished; and (iii) the protectionist policy of the new United States administration, which is trying to reverse the strategy of low-cost country sourcing.

The aerospace industry maintains an oligopolistic structure at the top of the global value chain. In the civil segment of the aerospace industry, there are two subgroups of large commercial aircraft: long-haul commercial aircraft and regional aircraft, designed primarily for shorter-haul flights. The Airbus parent company European Aeronautic Defence and Space Company (EADS), based in Toulouse (France), and the United States firm Boeing are the two biggest aircraft manufacturers in the world and the undisputed leaders in long-haul aircraft production. The Canadian firm Bombardier and the Brazilian firm Embraer are the key players in the regional aircraft subgroup. The United States firms Lockheed Martin and Northrop Grumman are leaders in the military aircraft industry (Flight Global, 2017).

The aerospace industry maintains high levels of investment in R&D, particularly aircraft manufacturers and tier 1 suppliers. In terms of R&D intensity, the aerospace industry's performance is similar to that of the automotive industry in aggregate terms, with investments worth 4.3% of total sales (European Union, 2017). However, in the main, innovations in commercial aircraft tend to be non-disruptive continuous improvements, especially in safety, energy efficiency, environmental protection and passenger comfort. There are at least three barriers that hinder disruptive innovation in the aerospace industry: long production and life cycles of aircraft; a relatively small pool of potential customers; and control and certification constraints (AlixPartners, 2015).

R&D efforts have focused mainly on three key areas: (i) energy efficiency, by combining new, lighter and stronger materials with aspects of aerodynamic fuselage design and engine performance; (ii) environmental impact mitigation, primarily in the areas of energy efficiency, carbon dioxide emissions and noise pollution; and (iii) safety, by exploring new solutions involving the use of more stress- and fatigue-resistant materials and the incorporation of new hardware and software solutions to improve warning and anomaly-detection systems and automatic flight control and other systems. To this end, the industry is incorporating more and more new technologies, such as artificial intelligence, sensor technology, big data analytics, additive manufacturing and the Internet of Things (UNCTAD, 2017).

(b) Mexico: a specialist supplier of parts and components to North American aircraft manufacturers

The beginnings of Mexico's aerospace industry date back more than 30 years, when Honeywell and Westinghouse started manufacturing basic components in Chihuahua City for use in United States defence aircraft (Ornelas, 2016). However, it was not until the mid-2000s, when the Canadian firm Bombardier Aerospace announced an initial investment of US$ 200 million to build a plant in the state of Querétaro, that the aerospace industry began to rise to prominence in Mexico (*La Jornada*, 2005).

This makes Mexico one of the few developing countries to have succeeded in carving out a space in the aerospace industry's global value chain. However, the country neither produces nor exports aircraft (whereas its automotive industry does produce and export vehicles) but instead has specialized in producing a relatively limited set of parts used as inputs for the manufacture of aircraft, which continue to be assembled in advanced economies. Over the past decade, the Mexican aerospace industry has experienced annual average growth of 17% (Bautista, 2016).

At present, just over 300 firms carry out different activities within the value chain, 95% of which are foreign firms (Vázquez, 2017). Between 1999 and 2017, Mexico's aerospace industry received FDI worth around US$ 3.2 billion (Secretariat of Economic Affairs of Mexico, 2018b). Based on the foreign investment announcements of leading firms in the global aerospace industry, Mexico ranks third (after China and the United States), ahead of economies with a strong aerospace tradition, like the United Kingdom, France, Canada and Germany (see figure II.25). In the period 2012-2017, just over 4% of the total investment announced by the global aerospace industry was for Mexico.

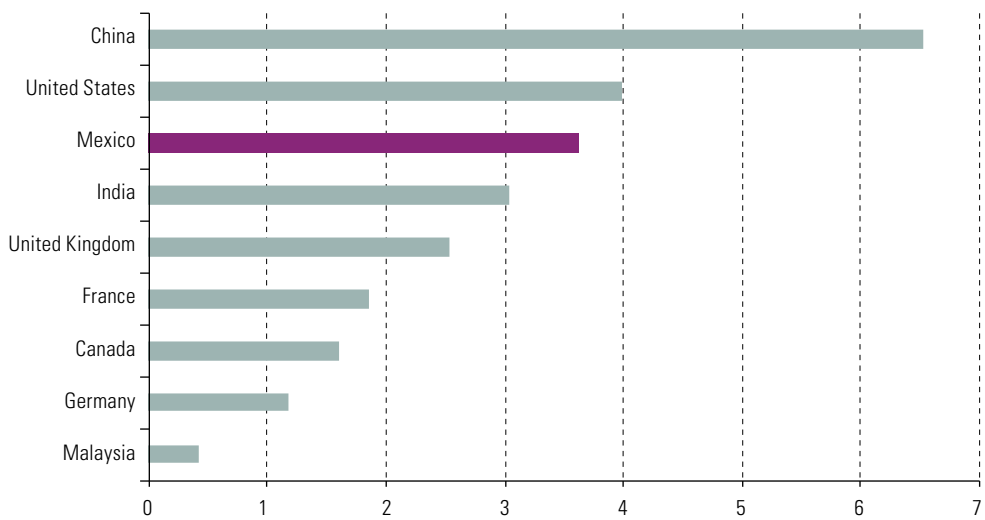


Figure II.25
Main recipients of foreign investment announced by the aerospace industry, 2012–2017
(Billions of dollars)

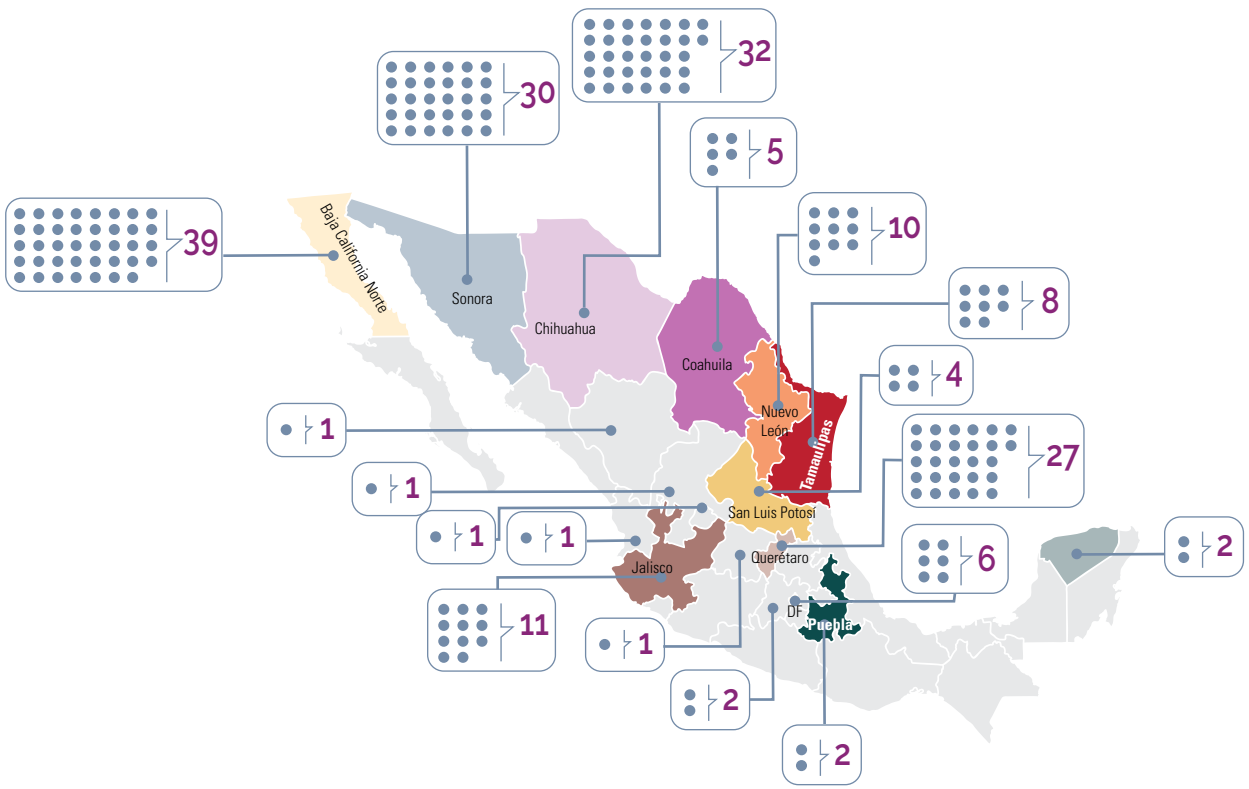
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets.

In 2017, exports of parts and components for the aerospace industry accounted for a mere 1.1% of the country's total manufacturing exports. A number of aircraft manufacturers and tier 1 suppliers operate in Mexico, carrying out processes at different levels and with varying degrees of integration, although their activities do not include the assembly of final products in Mexico. Some of the most important manufacturers and suppliers operating in Mexico are: Bombardier, Cessna, Beechcraft, Bell Helicopter, MD Helicopters, Eurocopter, Embraer, Gulfstream, Fokker, Honeywell, General Electric, Safran, Daher, Senior and Sargent. Virtually all the sector's output is for export, mostly to the United States. Under the rationale of an integrated NAFTA market, Mexico has also increased its relevance in the aerospace industry by importing components for the manufacture of aircraft in the United States.

The companies that have set up in Mexico have been able to leverage capabilities amassed over several decades of industrialization, mainly in the export of electronic goods and autoparts (Contreras and Bracamonte, 2013). In general, companies located in Mexico have highly defined patterns of specialization, focusing on product manufacture and processes, which have not changed much in recent years.[13] For example, Bombardier assembles electrical harnesses, fuselage structures, aircraft tails and stabilizers, while Hawker Beechcraft manufactures sheet metal parts for wings, tails and fuselages, landing gear covers, air navigation instruments, valves, fasteners, switches and aircraft seat parts. The vast majority are tier 3 and tier 4 companies, meaning that they supply other firms in the global value chain, although, over time, the share of tier 1 and tier 2 companies has grown. Support services to the industry have also been growing, particularly in engineering, design and R&D. While it is not a widespread practice, General Electric has an engineering centre in Querétaro (*Excelsior*, 2011).

As with other export sectors, most of the production capacity of Mexico's aerospace industry is located at the country's northern border, mainly in the states of Baja California, Chihuahua, Nuevo León, Querétaro and Sonora, where it has created some 50,000 direct jobs. Baja California is home to the largest number of companies in the sector. However, in recent years, the biggest investments have been concentrated in Querétaro, where Bombardier, Safran and General Electric have set up operations (see map II.5).

Map II.5
Number of main aerospace companies with operations in Mexico, by geographic location, 2017



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from American Industries [online] http://www.americanindustriesgroup.com/aerospace/.

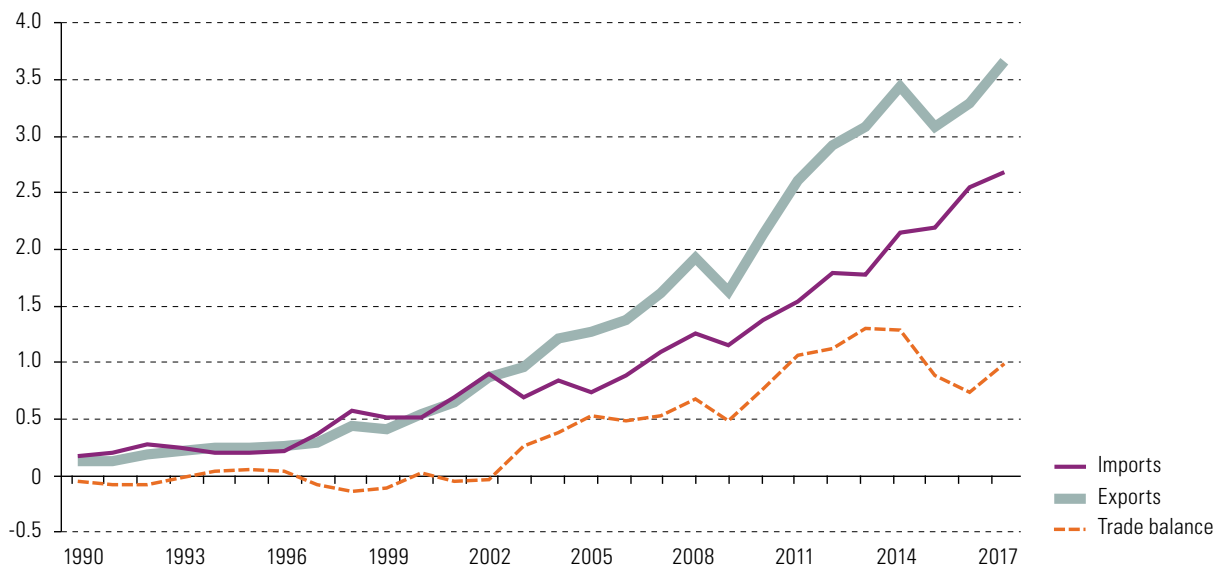
[13] In Mexico, the most important aerospace activities are the: (i) manufacture of engine parts and components (including propellers and rotors); (ii) manufacture of electrical cable accessories and harnesses; (iii) manufacture of metal parts (milling, turning and numerical control machines); (iv) production of fuselage parts and components (engine nacelles, pylons and stabilizers); (v) development and management of computer system software; and (vi) supply of materials, such as aluminium and steel.

Given its characteristics, Mexico's aerospace industry is definitely more closely integrated intoglobal value chains than into local clusters, as it is driven more by centrifugal than by centripetal forces. Mexican aerospace clusters adopt the satellite platform model, where a group of manufacturing firms share a common location without there being any significant interaction amongst them (Martínez, 2011).

This does not mean that transnational companies in the aerospace industry have no suppliers in Mexico. Indeed they do, but the vast majority are other foreign companies (Gomis and Carrillo, 2016). Moreover, there are still very few Mexican firms supplying transnational aerospace companies (Hernández, 2015). In 2013, only eight of Bombardier's suppliers were Mexican (*El Universal*, 2013). However, as mentioned earlier, there are high barriers to entry to the aerospace industry because of strict technology standards and safety certification and the need for large-scale investment (Hernández and Carrillo, 2018).

To sum up, despite its rapid growth, the aerospace industry is still a fledgling part of Mexico's production and export structure (see figure II.26). This makes the country a minor player in the global aerospace industry. In 2016, Mexico was the world's thirteenth largest exporter of aircraft parts and components, with a 1.8% share of total exports from the sector. However, the keen interest that aerospace companies are showing in Mexico, reflected in its ranking as third most important destination for announced investments, would suggest that the strong growth trend is set to continue over the coming years, holding out the possibility of local firms becoming integrated into the supply chain.

Figure II.26
Mexico: exports, imports and trade balance of parts and components for the aerospace industry, 1990–2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

C. Conclusions

In recent years, there has been growing geographical fragmentation of production chains, especially those associated with technology-intensive products and services, for which there are significant economies of scale and a global market. The advent of global value chains has led many countries to specialize in certain stages of production, importing inputs and exporting intermediate or final products. However, in many cases, high export values or a trade surplus in a specific product or service does not necessarily mean that a production process is rooted in the local economy. Moreover, international trade statistics tend to distort the real impact of this process of production restructuring and fail to expose the limited contribution of these export activities in terms of domestic value added.

For the most part, Mexico is a good example of this trend. As the country has increased its exports, with a growing share of manufactured goods, its imports of intermediate inputs have also increased. Thus, many of the production processes have been concentrated in the less sophisticated stages, such as assembly and some labour-intensive activities, which limits the contribution of export-oriented manufacturing sectors to value added. This has restricted the country's ability to close gaps with the most advanced economies by shifting to production specialization with a high science, technology and innovation content.

Two of Mexico's chief comparative advantages are geographical proximity to its main export market (the United States) and lower labour costs. This has prompted numerous companies, not only from the United States but also from the European Union and Asia, to set up in Mexico in order to use it as a base for exporting mainly final goods, together with some intermediate inputs that are incorporated into North America's regional value chains.

Mexico's current production specialization and its position in North America's regional value chains is not necessarily a poor indicator, as it could open up interesting opportunities for technological upgrading. In fact, a number of companies have deployed active strategies to incorporate Mexican operations into the most sophisticated segments of the production chain, such as R&D activities and actions designed explicitly to develop and strengthen the local supply chain, in conjunction with various federal and state agencies and private organizations. These initiatives have been concentrated in the automotive, aerospace and electronics industries, albeit not on a wide scale. In advanced manufacturing sectors exposed to rapid and disruptive technological change, endogenous capacity-building in more complex activities, coupled with strengthening and coordination of the production ecosystem by incorporating different-sized local firms, is vital to sustaining and ensuring the survival of industries that have been key to Mexico's recent development.

In 2017, Mexico's automotive industry posted record highs in its main indicators: production, exports, trade surplus and FDI. This has enabled the country to acquire the necessary foreign currency to finance imports of both intermediate inputs and final consumer goods, especially technologically more advanced products that are not produced domestically. In addition, the current boom in the automotive industry has led to a steady rise in employment and, to a lesser extent, in wages.

Mexico's automotive industry appears to be completing a particularly successful period during which it has established itself as a tier 1 supplier of vehicles in the subcompact segment for the demanding United States market. Given this pattern of specialization, the production capacity of companies operating in Mexico is at the technological frontier and, with the arrival of new manufacturers focused on high-end

vehicle production, the sector's upward trajectory looks set to continue from a technology and production standpoint. However, the potential disruptive changes on the horizon for the global automotive industry would clearly have a heavy impact on the automotive sector's operations in Mexico.

Changes in consumption patterns, geared increasingly to the sharing economy, with car-sharing growing to the detriment of private ownership, are altering vehicle characteristics and performance, as well as the form and volume of production. Furthermore, the rapid and growing incorporation of technological change into automotive production (artificial intelligence, the Internet of Things, connectivity, new materials and alternative drive systems) is expected to make the goal of seeing autonomous vehicles on our roads a reality early in the next decade. This makes the convergence of the electronics industry with information and communication technologies, nanotechnology and advanced manufacturing sectors all the more evident and rapid. Similarly, the transition from conventional internal combustion-engine vehicles to electromobility should begin to accelerate in the near future, triggering major changes in the supply chain. This has prompted traditional manufacturers and their suppliers to embark on an intensive process of restructuring business models, seeking new partnerships and designing new mobility options to meet changing consumer requirements.

On the back of strong development and capacity-building in the automotive sector, Mexico has succeeded in positioning itself in the aerospace industry. This is particularly significant because Mexico is one of the few emerging economies to participate in the global value chain for aircraft production. Globally, this industry is characterized by high business and geographical concentration (confined to a few industrialized countries) and a production chain controlled vertically, especially in the relationship between client companies and external suppliers. Although Mexico does not assemble aircraft, it has managed to position itself as a producer of some important parts and components. This is an industry with great potential for growth and linkages with other strong sectors of the Mexican economy, such as the automotive and electronics industries. In fact, Mexico has become one of the most important destinations for recently announced FDI in the aerospace industry, surpassed only by China and the United States. The aerospace sector could therefore facilitate export diversification and sophistication through quality employment and technological diffusion, thanks to the high level of engineering and technical knowledge required, which could eventually be applied to other advanced manufacturing sectors.

In this context of far-reaching change and deep uncertainty, Mexico faces great challenges. The persistent productivity gap between the country's modern and traditional sectors will continue to increase structural heterogeneity. The coexistence of a modern economy integrated into global value chains and traditional, low-productivity sectors, and the lack of linkages between the two, does not contribute to equitable development.

Public institutions and governance are key. A weak and ill-coordinated institutional architecture, tight budgets, lack of continuity in public policy and poor leadership ability have helped to perpetuate enclave economies separate from the rest of the production base. All this has hampered the integration of smaller local companies into the production chains of modern sectors and the diffusion of technology from firms integrated into global value chains to the rest of the economy.

To reverse this situation and seize the opportunities presented by global transformations, Mexico should strengthen its production ecosystems. This calls for clearly identified public institutions with clearly defined roles and responsibilities in order to prevent duplication and friction, along with financial and human resources that are commensurate with the objectives set. The integration of different economic structures through production linkages that promote science, technology and innovation also calls for consultation

and coordination between public and private stakeholders. This will enable smaller local actors to progressively meet the strict quality standards demanded by industries integrated into global value chains and so become part of their supply chains.

These difficulties are particularly apparent in the electronics industry because of low value addition in Mexico's exports. An estimated 97% of the electronic components used in Mexico's industry are imported. The semiconductor segment is particularly relevant to the electronics industry (as semiconductors are the basis for developing any type of electronic device), and Mexico has a limited presence in North America's regional value chains. Despite various public and private initiatives to develop a local supplier base, the results have not been very encouraging. The most interesting experiences have been at local level, where denser clusters have been established, mainly because of incoming foreign companies. Moreover, in view of the electronics industry's role as a multisector technological enabler, there is an urgent need to improve domestic capabilities in the industry to enable Mexico to close existing gaps with advanced economies and to take advantage of the opportunities that arise from technological and production changes and by new patterns of consumption.

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CHAPTER III

Global pressures and the search for efficiency: export platforms in Central America and the Dominican Republic

Many transnationals have set up operations in Central America and the Dominican Republic as a way of cutting their production costs. These types of investments are being made in Mexico, as well, and are common in many Asian and some African countries, but they are rarely seen in the rest of Latin America and the Caribbean. This strategy has led to the development of export sectors based on low labour costs and preferential access to the United States market as a means of coping with technological changes, competition from Asia and modifications in trade treaties with the United States. Most of these export activities take the form of assembly plants or factories that process certain components, many of which come from the United States, and then re-export them.

These types of industrial development processes clearly have some shortcomings, with one of the most glaring ones being the weakness of these plants' linkages with the surrounding economy. Nonetheless, they represent one of the main ways in which foreign direct investment (FDI) has been changing production patterns in the region. This chapter offers an analysis of the current status of these industries, the trade and investment policies that back them up and the challenges that they face in the short run.

This analysis focuses on manufactures that are exported to countries outside Central America and on service exports. It therefore does not cover many industrial sectors that play an important role in these economies (e.g. food and beverages) or the growing trade flows within Central America itself. It does, on the other hand, include the Dominican Republic because that country has followed the same development path in terms of manufactured exports as its Central American neighbours and because it is also party to the trade agreement providing access for such manufactures to the United States market (The Dominican Republic - Central America - United States Free Trade Agreement (CAFTA-DR)).

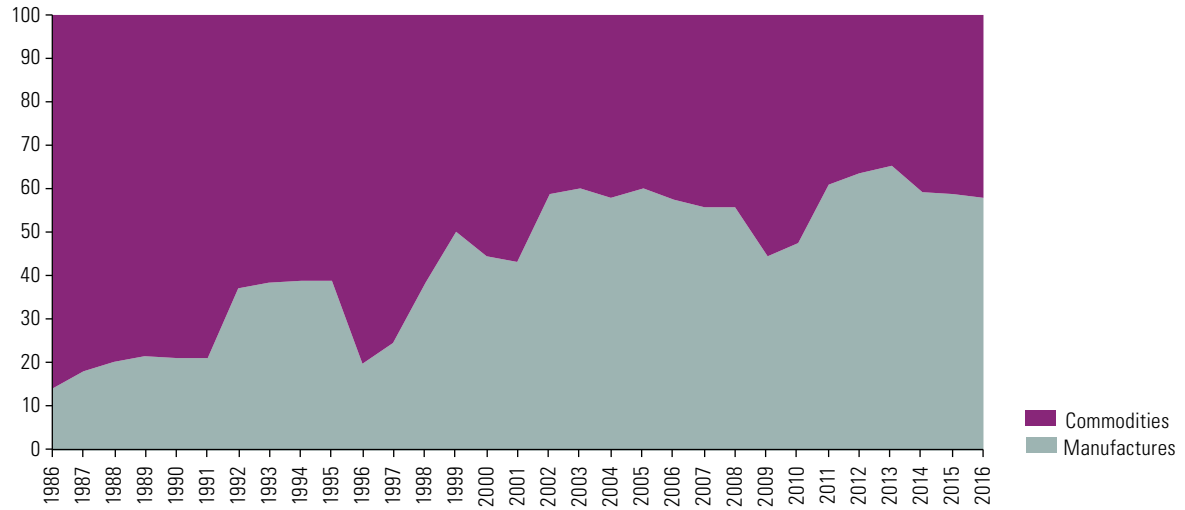
A. Export platforms undergoing continuous change

1. From commodities to manufactures and services

During the 1980s, the Central American countries and the Dominican Republic began to diversify their exports, which until then had been completely dominated by commodities, and started to develop labour-intensive industries catering to the United States market. The strategy embraced by the governments of these countries involved opening up their economies to external trade (by means of devaluations, among other measures), opening the door to FDI and ensuring their access to the United States market through the Caribbean Basin Initiative. That initiative (the Caribbean Basin Economic Recovery Act) was launched by the United States in 1984 in order to bolster the exports of this subregion while, at the same time, supporting the United States garment industry by helping it to transfer its most labour-intensive operations to countries where labour costs were lower.

Clothing manufacturers seized this opportunity, and the share of the Central American countries and of the Dominican Republic in world trade, and especially in trade with the United States, began to grow. Between 1990 and 1999, the share of Central America and the Dominican Republic in United States imports climbed from 0.47% to 0.77%. At the same time, the share of these countries' exports represented by commodities began to shrink while that of manufactures began to expand, rising from less than 20% of their total exports to over half (see figure III.1), although with significant differences across countries.

Figure III.1
Central America and the Dominican Republic: exports of commodities and manufactures, 1986-2016
(Percentages of exports of goods)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

These changes in the export structure mirrored the changes that occurred in the industrial structure as clothing export industries began to appear, followed by electronics and electro-medical equipment industries. This transition has continued in recent years with the emergence of new export activities in the services sector.

New export industries are being developed in Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and the Dominican Republic, although at different paces and points in time. The importance of these industries in terms of these countries' overall economies is difficult to quantify on the basis of the countries' official statistics, however. In Costa Rica, the government estimates that their share of GDP in 2016 amounted to 6% (Medaglia and Mora, 2016). As sources of employment, these sectors account for 5% of all jobs in Costa Rica, 4% in El Salvador, Honduras and the Dominican Republic and 3% in Guatemala.

Panama has followed a different development path based on the growth of service activities linked to the Panama Canal and to its role as a logistical hub for the region. It marked up the highest growth rate in all of Latin America for the past decade and is the region's largest FDI recipient relative to the size of its economy. Nevertheless, it exports almost no goods and is therefore not included in this section, but is covered in the section on exports of services.

2. The pivotal role of foreign direct investment

The development of exports of manufactures (and, later, of services) in Central America and the Dominican Republic has been inextricably linked to the effort to attract FDI. While some economies have developed local export industries, such as that of Taiwan Province of China (UNCTAD, 2002), small, low-income economies such as those of Central America have needed to turn to foreign firms to supply them with capital, technology and trading networks, while, for these companies, Central America and the Caribbean basin offer a convenient location that allows them to cut costs and enjoy ample access to the United States market.

The kind of data that would be needed to differentiate national from foreign investment in manufacturing export industries are not available in all the countries, but what evidence there is indicates that foreign investment far outweighs domestic investment in this area. In the Dominican Republic, for example, Dominican firms account for no more than 21% of total investment in free trade zones (CNZFE, 2017). In El Salvador, a majority of the companies in the sports attire cluster are foreign (Antunes and Monge, 2013). In Nicaragua, 90% of the apparel companies are foreign-owned.[1] In Mexico, as well, transnational corporations dominate most export industries, and this is especially true of those having a greater technological content, such as the automotive and aeronautics industries.

The reason why foreign firms dominate these industries is not so much because of their greater financial or technological capacity but rather because they play a pivotal role in global value chains in which Central American plants are just one link among many. There are two types of business models in these sectors. In the first, factories located in Central America are "captive" plants and do business almost exclusively with other affiliates or subsidiaries in the same group, from which they buy components and to which they then sell the finished product. This is the most common model found among manufacturers of medical equipment and remote business service providers and is the one that was used by the Intel microprocessor assembly plant.

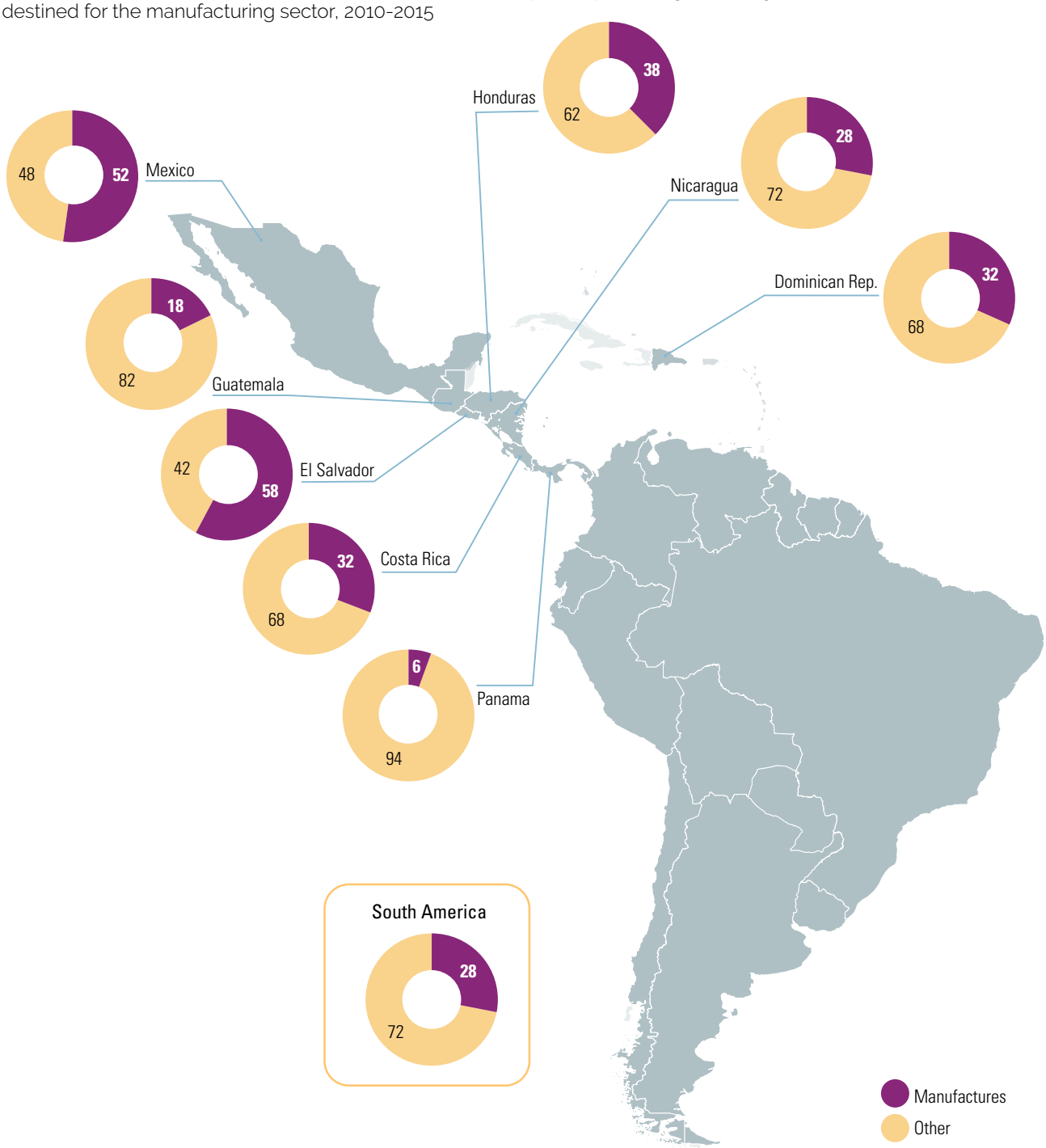
The second type of business model is one in which companies may buy their components or inputs and sell their products on the market, although they usually have a limited number of customers and suppliers. This model is more common in the clothing industry and, in theory, is more open to the entry of efficient local firms, although in many cases the final buyers require certifications of their suppliers that are difficult for local firms, and especially the smaller and medium-sized ones, to obtain (Antunes and Monge, 2013).

Even in the case of the clothing industry, however, foreign firms continue to dominate, while national companies are almost always smaller or are relegated to lower-level links in the chain. There are very few firms in Central America that have used these industries as export platforms that could serve as a springboard for their growth and transformation into transnationals themselves. Exceptions include the textile firms Grupo M of the Dominican Republic, which maintains a presence in Haiti, and Grupo Karim's of Honduras, which has plants in Mexico and Pakistan. For the most part, Central American companies that have succeeded in converting their operations into transnational enterprises are mainly in other sectors, such as food and beverages, construction or banking (ECLAC, 2014b).

The important role of transnational corporations in the manufacturing sector is reflected in its FDI inflows, which have invariably been larger in Central America and the Dominican Republic (as well as in Mexico) than in the rest of Latin America and the Caribbean. About half of all FDI entering El Salvador and Mexico and approximately one third of the FDI flows to Costa Rica, the Dominican Republic and Honduras are destined for the manufacturing sector. In the South American countries for which data are available, 28% to total FDI flows go to manufacturing industries (see map III.1).

[1] Interview with PRONicaragua, the Nicaraguan Government's official investment promotion agency.

Map III.1
Central America (6 countries), Mexico and the Dominican Republic: percentage of foreign direct investment destined for the manufacturing sector, 2010-2015



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official information from the respective countries.

In absolute terms, the largest percentages of FDI flows destined for the manufacturing sector are in the Dominican Republic, followed by Costa Rica (see table III.1). It is noteworthy, however, that FDI inflows to that sector are not on the rise in any country except perhaps El Salvador. This is attributable, in part, to the lack of any expansion of the export sector in the past decade and, in part, to the growing importance of service exports, which have gained ground relative to manufactures.

Table III.1
Central America (6 countries) and the Dominican Republic: foreign direct investment in the manufacturing sector, 2010-2016
(Millions of dollars)

	2010	2011	2012	2013	2014	2015	2016
Costa Rica	966	737	634	306	419	799	…
Dominican Republic	638	503	1 420	553	798	605	547
El Salvador	(65)	149	(47)	285	88	292	296
Guatemala	299	150	145	186	179	204.8	228.3
Honduras	341	392	438	325	667	395	237
Nicaragua	108	226	302	234	246	280	275
Panama	(114)	298	520	142	250	116	159

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official information from the respective countries.

The figures on FDI in the manufacturing sector shown in table III.1 cover not only the export processing industries analysed in this chapter but also other, more capital-intensive activities, such as the cement industry and food and beverage producers. As one example, the US$ 1.2 billion that Anheuser-Busch InBev spent to buy half of Cervecería Nacional Dominicana in 2012 is equal to the total investment in manufactures and services for export in that country over the last seven years (although it can be assumed that this investment had much less of an impact on the Dominican economy, especially in terms of production capacity and employment).

3. Formal-sector jobs and above-average wages

The main way in which these industries help to drive development is by providing a large number of formal-sector jobs, since all of them are highly labour-intensive. By comparison, US$ 1 million in investment in the food and beverages industry will create, on average, 4 jobs, while that amount of investment will create 14 jobs in the medical equipment industry and 80 jobs in the wearing apparel industry. Remote business services create over 100 jobs for that amount of investment (*Financial Times*, no date).

Although the firms investing in these countries are doing so in search of lower wage bills, this does not mean that their workers are paid more poorly than the national average; on the contrary, their pay levels tend to exceed the national mean. For example, in El Salvador, the average wage for call-centre operators, which is the low-end segment of the export services sector, is twice as much as an office clerk earns; in Guatemala, the pay level is 69% higher and in Honduras it is 36% higher. In Costa Rica, the average salary in the free trade zones (equivalent to US$ 1,550) is 1.8 times the national average.

In addition, companies operating in the free trade zones offer formal contracts to workers in countries where the rate of informality is high. Apart from Costa Rica and, to a lesser extent, Panama, where the informal sector is smaller, between 51% and 44% of male workers and between 33% and 25% of female workers in the subregion do not have an employment contract (ECLAC, 2017a).

In the six countries for which data are available, nearly 800,000 people are employed in these export industries (between 5% of all workers in Costa Rica and 3% of total employment in Guatemala) (see table III.2), where they are usually categorized as employees of registered firms operating in free trade zones.

Table III.2
Central America (5 countries) and the Dominican Republic: total employment in firms operating in free trade zones, 2016
(Number of employees)

Country	Manufactures	Services
Costa Rica	36 192	61 395
Dominican Republic	138 798	24 349
El Salvador	189 897	25 000
Guatemala	163 170	...
Honduras	146 000	...
Nicaragua	109 106	8 900

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official information from the respective countries.
Note: The figure given for manufacturing employment in El Salvador includes all such jobs, both in the free trade zone and outside of it.

Another important aspect of the situation is the large percentage of female workers. In countries where the female labour participation rate is far below the male participation rate, these export industries and services employ equal numbers of men and women. In the clothing industry, around 60% of all workers are women. Thus, export industries offer a unique opportunity to thousands of women in the subregion to join the formal labour market.

This pattern is not confined to Central America: the female labour participation rate is also much higher in labour-intensive activities (especially the clothing industry) than in the rest of the economy in Asia and Africa as well. A number of factors may be feeding into this trend, including the fact that women generally have a lower level of educational attainment in these countries and the nature of traditional gender roles, combined with the prevailing belief that women are better and faster at fine manual work.[2] It is noteworthy that, in countries where the textile and apparel industries have transitioned to more sophisticated and capital-intensive modes of production, the percentage of women workers has fallen off sharply (Kucera and Tejani, 2014).

Even though the high female employment rate in these industries may be attributable to the fact that they are offering low-skill jobs, these enterprises are nonetheless providing a unique opportunity in low- or mid-income countries with large informal sectors for people to obtain employment in the formal sector and, given the sheer number of jobs that they create, are acting as a driver of social change. In the Dominican Republic, it has been found that the presence of free trade zones in a given district was reflected in an increase in the years of schooling attained by women and reduced the probability of early marriage by 30%. The study also found that the increase in job opportunities for women led to a change in general attitudes whereby greater value came to be placed on girls' educations. This change held firm even in the face of external shocks that caused female employment in the free trade zones to decline (Sviatschi, 2013).

[2] In her study on the Mexican manufacturing sector, Salzinger (2013) observes that it does not matter whether women are more productive assembly-line workers or not; what is important is that employers think that they are.

4. Differing trends in different sectors

Total employment in these export industries has not changed drastically in recent years, but their composition and even their business models have changed a great deal. This section offers an analysis of how the three main manufacturing export industries (clothing, electronics and medical equipment) have evolved.

The apparel industry was the first of these activities to be established in the subregion, and it remains the largest of all, with some US$ 8 billion in gross annual exports and a presence in all the countries except Costa Rica. It is followed by medical equipment, with some US$ 3 billion per year in exports from Costa Rica and the Dominican Republic. Finally, there is the electronics industry, which was very active when Costa Rica was producing microprocessors but which now accounts for only slightly over US$ 2 billion in annual exports from Costa Rica, the Dominican Republic, Nicaragua and Honduras. Almost 90% of clothing exports and 80% of the exports of medical equipment are sold to the United States.

These three industries' total exports have been quite stable in recent years, but their competitive positions in the United States market are quite different from one another.

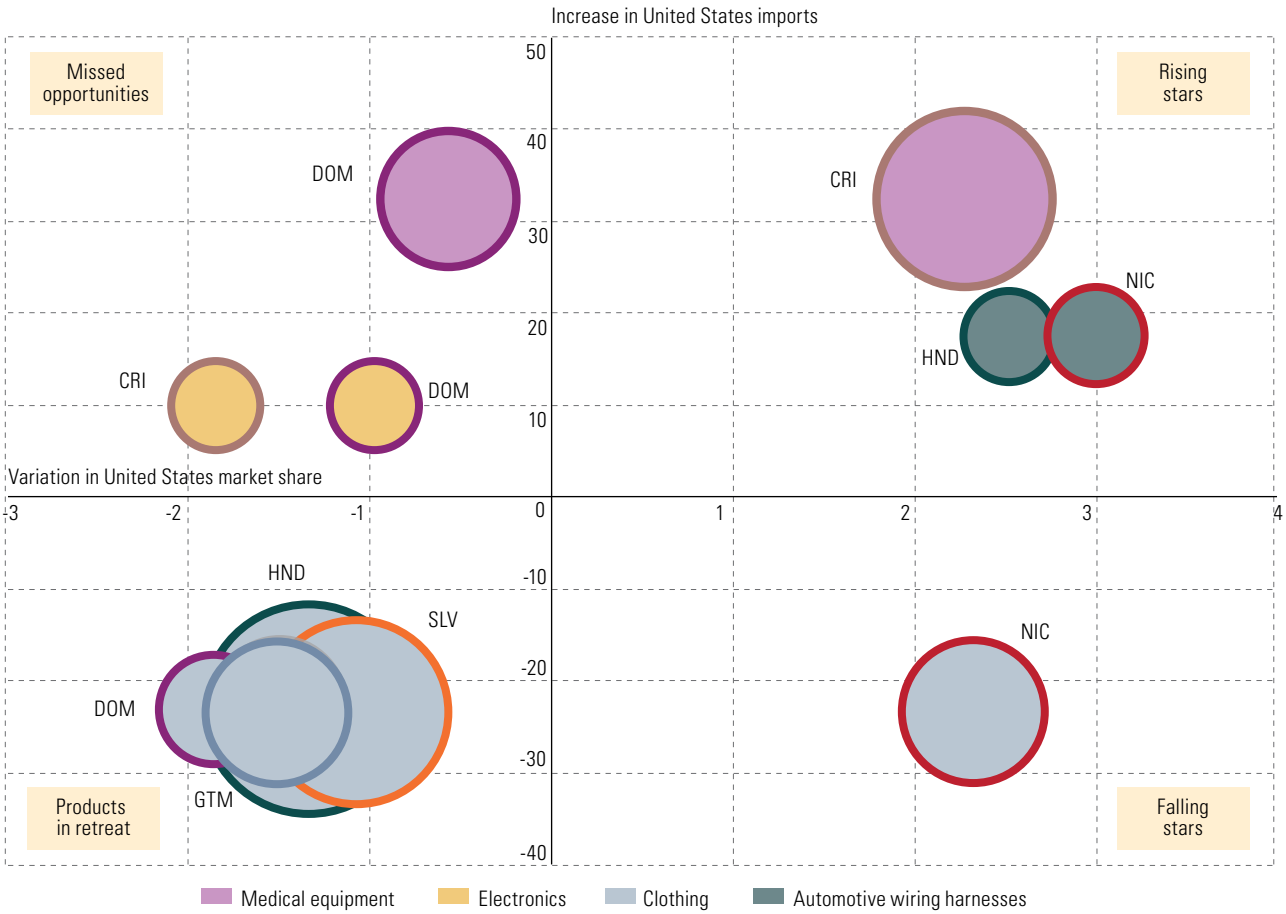
Figure III.2 illustrates each of the countries' competitive position in these industries using the Trade Competitive Analysis of Nations (TradeCAN) methodology. The apparel industry accounts for the highest levels of exports (as shown by the size of the circles), but it is the only one of the three that is on the decline in the United States (i.e. the United States' clothing imports are accounting for a smaller and smaller proportion of its total imports). What is more, the market shares of all of these countries, except Nicaragua, have shrunk since 2002 as exports from Asia gain ground.

The electrical equipment industry (in which only Costa Rica and the Dominican Republic are significant exporters) appears as a "missed opportunity" because, even though that sector is expanding in the United States, both of those countries lost market share between 2002 and 2016. The production of automotive wiring harnesses in Nicaragua and Honduras (a segment within the electrical equipment sector which is shown separately here) appears as a rising star because both of these countries managed to expand their market shares during the period in question.

Finally, the medical equipment industry, which is the fastest-growing sector in the United States, is labelled as a "missed opportunity" for the Dominican Republic but as a "rising star" for Costa Rica.

The above data indicate that further growth in clothing exports to the United States is not to be expected, although there could be some expansion in certain niche markets, while the other sectors, and especially medical equipment, are more promising. These sectors will be analysed in greater detail in the following sections.

Figure III.2
Central America (5 countries) and the Dominican Republic: competitive positions of the various manufacturing exports, 2002-2016



Source: Economic Commission for Latin America and the Caribbean (ECLAC), Trade Competitive Analysis of Nations (TradeCAN).
Note: The X axis represents the growth (or decrease) in each of the countries' shares in the United States market in each of these industries, measured in logarithms for 2002-2016. The Y axis shows the percentage gain (or loss) of each industry's product share in the United States' total imports between 2002 and 2016. The size of the circle is proportional to the dollar value of that industry's exports for each country in 2016.

(a) Clothing: the "full package" strategy for facing up to competition from Asia

The clothing industry was one of the first large economic activities to move offshore en masse to developing countries, and Mexico, along with the Central American and some Caribbean countries, jumped on this bandwagon and doubled their share of the United States market between 1990 and 2002 (from 8% to 16%) (ECLAC, 2004). Since then, however, competition from Asia has eroded the United States market shares of the Dominican Republic and all the Central American countries except Nicaragua (see figure III.2). Five of the six largest clothing exporters to the United States are Asian (China, Viet Nam, Bangladesh, Indonesia and India), and the Central American countries are losing market share to all of them. The only one that they have managed to make headway against is Mexico (the sixth-largest exporter).

This trend strengthened in 2005 with the termination of the Multi-Fibre Arrangement and its quota system for clothing exports. When that agreement came to an end, the exports of Latin America and the Caribbean to the United States plummeted, while

those of Asia, and particularly of China, took up the slack. Costa Rica, which had been a major exporter, has nearly withdrawn from the industry altogether, and clothing exports from the Dominican Republic have also fallen sharply, slipping from over US$ 2 billion to less than US$ 700 million per year.

Honduras and Guatemala have managed to make a comeback and are now maintaining their exports levels, and El Salvador has succeeded in regaining its former market share since 2006, thanks to its specialization in sportswear and its transition to a vertical integration model. Nicaragua is the only country that has expanded its share of the United States market since 2002, although starting from a much lower level than all of its neighbours (see table III.3); it was also aided by a temporary special regime (discontinued at the end of 2016) under which it was allowed to export garments made from Asian textiles.

Table III.3
Central America (5 countries) and the Dominican Republic: clothing exports, 2005-2016
(Millions of dollars)

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Costa Rica	473	235	212	266	148	161	172	193	129	106	63	59
Dominican Republic	1 902	1 682	1 020	804	701	551	646	753	578	824	776	690
El Salvador	1 685	1 611	1 600	1 719	1 385	1 696	1 829	1 912	2 067	2 076	2 178	2 134
Guatemala	1 506	111	1 390	1 230	1 049	1 187	1 255	1 229	1 318	1 325	1 372	1 316
Honduras	2 457	2 305	2 125	2 255	1 544	1 993	2 430	2 496	2 452	2 602	2 866	2 789
Nicaragua	...	...	...	...	...	...	...	1 130	1 275	1 368	1 281	...
Total	8 024	5 945	6 347	6 273	4 827	5 588	6 333	7 714	7 818	8 301	8 536	6 987

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE) and official information from the respective countries.
Note: Products in category 84 of the Standard International Trade Classification (SITC), Rev. 2.

The value chain in this industry is controlled by the buyers, most of which are major brands that design and sell both clothing and footwear but outsource the manufacture of these items to other firms, both big and small. The majority of the producers that have set up plants in Central America and the Dominican Republic are from the United States and Canada (e.g. Hanesbrands and Guildan) or Asia (e.g. Hansae and Nanyang Footwear). Many of them are manufacturers of long standing in their own countries that have survived by offshoring their production activities to lower-cost countries.

While these firms' strategies still involve locating their most labour-intensive activities in Central America, over the past 10 years they have also been moving towards the geographic consolidation of the value chain in the same country by encouraging producers of thread, fabrics and other inputs to set up shop in the same country where the assembly plants are located. This is known in the industry as the "full package" model. The most emblematic success story has been the production of sportswear in El Salvador (see box III.1), but the industry has also been transitioning towards this type of structure in Honduras (Gereffi, Bamber and Fernandez-Stark, 2016). In Nicaragua, although thread and fabrics are not being produced in the country, most of the firms in this industry no longer confine their operations to sewing but also do the cutting and finishing.

Box III.1
The "full package" strategy in the synthetic fibres and sportswear chain in El Salvador

The shift to a "full package" strategy in El Salvador came in response to growing competition from Asia and has also been a means of taking advantage of the local content rules established under the free trade agreement reached by the Dominican Republic, Central America and the United States. This strategy has been applied in the synthetic sportswear chain —a highly seasonal niche market— as a means of capitalizing on the fact that El Salvador is so much closer to the United States than Asia is.

This chain is composed of four major links, each of which involves a different kind of activity: the production of thread, the production of fabrics, garment assembly and the production of accessories. The first investments came in 2006 with the arrival of a Korean thread manufacturer and a United States producer of synthetic fabrics. The garment assembly segment, which is the most labour-intensive stage, is by far the largest (accounting for three fourths of the aggregate value of the chain). In 2013 the Economic Commission for Latin America and the Caribbean (ECLAC) identified some 25 firms in this chain in El Salvador, the vast majority of them being foreign enterprises, representing approximately 20% of the entire textile and garment industry in the country.

The full package strategy has enabled this industry to remain competitive in El Salvador, and the presence of thread and fabric manufacturers has opened up opportunities for innovation – something that is rarely seen in the assembly segment. Furthermore, the addition of a fabric printing segment has boosted the demand for skilled workers by as much as 10%.

This process has been supported by a series of policies aimed at creating an innovation centre for the sector, modifying the content of the courses offered by training centres and promoting other means of adapting to this industry's new structure. Efforts have also been made to lower the high cost of electricity in the country, which represents as much as 60% of thread manufacturers' production costs, modify customs procedures and expedite border crossings, as well as to increase the scale of this production cluster so that new, innovative processes can be introduced and new markets can be added.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of B. Antunes and C. Monge, *Diagnóstico de la cadena de fibras sintéticas-ropa deportiva en El Salvador* (LC/MEX/L.1119), Mexico City, ECLAC subregional headquarters in Mexico, October 2013.

For the most part, clothes producers in Central America have not succeeded in expanding their operations over the past decade but instead continue to lose market share in the United States; although sales to other Latin American countries are up slightly, these sales volumes are still far too small to offset setbacks in their main market. The sector has, however, managed to hold its own thanks to a combination of strategies. The countries with higher labour costs (Costa Rica and the Dominican Republic) are withdrawing from this industry, while those with lower wages (Nicaragua and Honduras) are strengthening their positions. Efforts are also being made to achieve a vertical form of integration that will allow the industry to respond quickly to changes in demand and to specialize in niche markets where it can play its trump card of geographic proximity to the United States market in order to face down competition from Asia. A product from Central America can reach the United States in 2 days, while a product from Viet Nam takes 20 (Cordero, 2016); this is of crucial importance, since investors place a high value on the ability to serve a market swiftly.[3]

[3] On the annual information form (SEC Form 40-F) filed by the Canadian firm Gildan Activewear Inc. with the Securities and Exchange Commission (SEC) of the United States on 24 February 2017, that company noted that: "Our largest manufacturing hub is in Honduras, Central America, strategically located to efficiently serve the quick replenishment requirements of our markets". See [online] http://www.gildancorp.com/documents/Annual-information-form-for-the-year-ended-January-1%2C-2017/Annual.Information.Form.ENG.pdf).

(b) The electronics industry in the wake of Intel's withdrawal

The category of electrical machinery, apparatuses and appliances includes a wide range of products,[4] but production activities in Central America involve just a few labour-intensive items, such as switches and power distribution wiring systems (especially automotive harnesses). Costa Rica, the Dominican Republic, Honduras and Nicaragua each export approximately US$ 500 million worth of these products annually, and these volumes have remained more or less steady over the past few years. The only new development has been the addition of diagnostic medical instruments and apparatus to Costa Rica's list of exports (US$ 125 million in 2016). These are a somewhat more technologically advanced manufacture that is linked to the important medical equipment industry in that country (see section c).

The first manufacturing plants in this sector were set up in Costa Rica in the 1990s at a time when that country's competitive position in the clothing industry was beginning to weaken. In 1995, two United States companies (DSC Communications and Sawtek Merrimac) set up operations in the country, and the Costa Rican Investment Promotion Agency (CINDE) launched a strategy for attracting investment in this sector, with its crowning achievement being the establishment of an Intel microprocessor plant in 1997 —an investment that Thailand, Brazil, Argentina, Chile and Mexico had all been vying for.

Intel's decision was based in part on Costa Rica's proximity to the United States and its relatively inexpensive and skilled labour force, but the efforts of the government, which offered a very generous incentive package, were also a factor (ECLAC, 2004).

The Intel plant boosted the country's export capacity enormously. Cumulative investment up to 2014 amounted to US$ 1.7 billion; the plant eventually had 3,000 workers who were earning twice as much as the average wage in the country's manufacturing sector and producing one fifth of Costa Rica's total exports, although imported components made up 82% of those exports (Monge-González, 2017). In fact, between 2005 and 2014, Intel exported almost as much as the rest of the electronics sector in Central America as a whole (see figure III.3), and the plant accounted for 0.6% of the country's GDP.

Figure III.3
Exports of integrated electronic circuits from Costa Rica and exports of all other electronics from Central America and the Dominican Republic, 2002-2016
(Billions of dollars)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

4 This category corresponds to chapter 77 of the Standard International Trade Classification (SITC).

At one point, Intel had as many as 190 local suppliers, many of whom reported having received training from it or having modified their products or altered their practices in order to meet its requirements. Intel's presence also prompted major delivery services such as FedEx and United Parcel Service of America (UPS) to establish offices in Costa Rica and promoted investment in education and human capital in the country. Intel's impact in terms of technological externalities was rather limited, however, because its linkages with local firms were confined to peripheral aspects of its business.

In 2014 Intel decided to close its Costa Rican plant as global demand for microprocessors flattened out in tandem with the slowdown in demand for computers as people switched to mobile devices. It laid off 1,500 production plant workers but kept its engineering and design operations in the country and expanded its shared services centre. It thus continues to employ around 2,000 people. Its staffing table now has a higher average skill profile, and the average wage is six times as high as the average industrial pay level in the country. In addition, the percentage of local value added has jumped from 18% to 44%, and opportunities for the generation of externalities have increased.

Exports of electronics from Central America have declined since the closure of the Intel plant but these items are still largely produced by foreign enterprises. Switches and power distribution wiring systems are still being produced in Costa Rica and the Dominican Republic, but both countries have been losing market share in the United States for these segments (see figure III.2). Honduras and Nicaragua produce automotive wiring harnesses that are exported to Mexico and the United States. These electrical products are some of the most labour-intensive ones in the automotive production chain and are the only segment that has been moved from Mexico to Central America. The Japanese firm Yazaki is the biggest employer in Nicaragua, with 16,000 workers in four different plants that supply harnesses to General Motors and BMW.

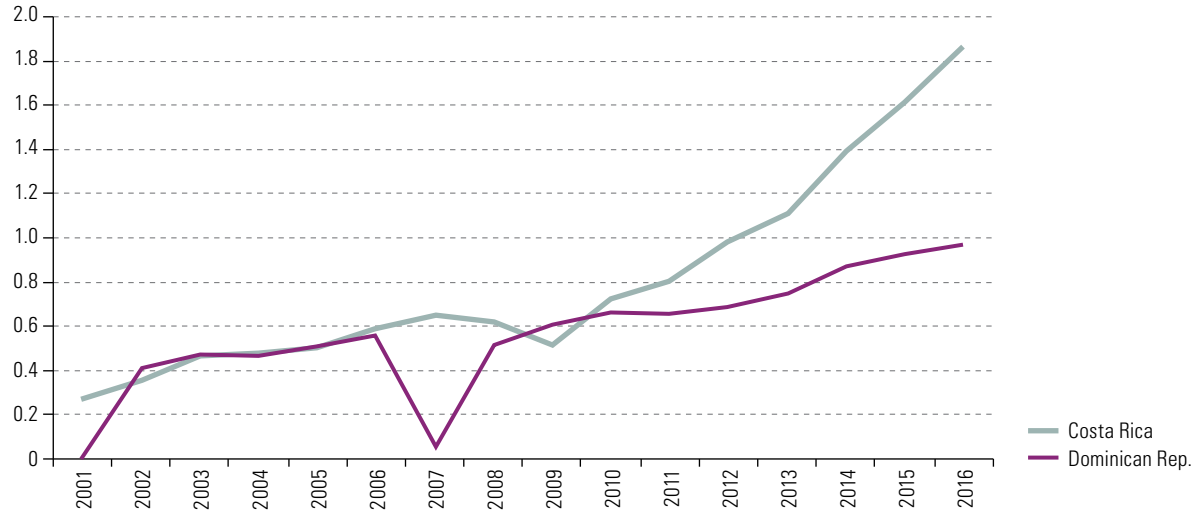
(c) Costa Rica and the Dominican Republic help to meet the demand for medical equipment

Electro-medical equipment and materials used in medical or dental treatments, excluding medicines, include a wide array of products, ranging from X-ray machines to prostheses and syringes, but they can be grouped into four main categories based on their technological complexity: disposable products, medical instruments, therapeutic apparatus and diagnostic equipment.

The first investments in this industry arrived in Costa Rica in 1999 and, shortly thereafter, in the Dominican Republic. Today, this product group is the biggest category of manufactured exports for both countries, with annual sales of almost US$ 1 billion for the Dominican Republic and of nearly US$ 2 billion for Costa Rica (see figure III.4).

As is also the case in other export industries, workers in the medical equipment plants in Costa Rica and the Dominican Republic, manually assemble components produced in other countries. This is a slightly more capital-intensive industry, however, which pays higher wages than the clothing assembly industry and makes greater use of local suppliers, thereby opening up opportunities for local firms to become part of the value chain (ECLAC, 2004).

Figure III.4
Costa Rica and the Dominican Republic: exports of medical equipment, 2001-2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

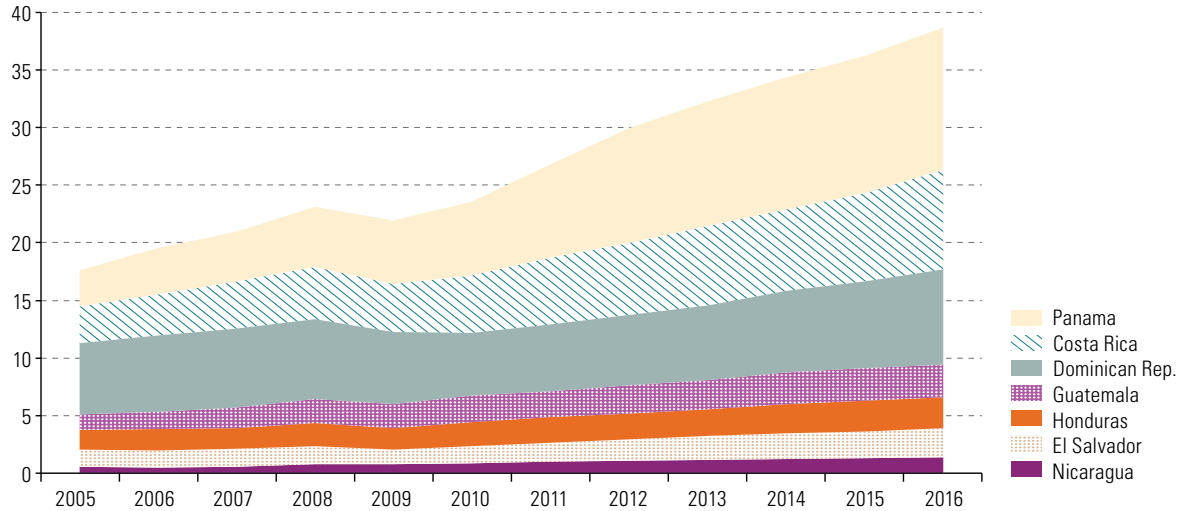
The Dominican Republic has been losing market share in the United States in this product segment, but Costa Rica has been gaining ground (see figure III.2). Production in Costa Rica is also shifting towards more sophisticated types of medical equipment. Disposable products (syringes, catheters and other items involving less value added) accounted for 90% of the country's exports of medical equipment in 2001 but for only 43% in 2017. As noted earlier, in 2016 and 2017 Costa Rica also began to export diagnostic equipment. In the Dominican Republic, the value chain is completely integrated into that of the United States, and almost all of its output is exported to that country. Costa Rica's exports of medical equipment, on the other hand, are now quite diversified, with one fourth of its output being sold to other developed economies —mainly the Netherlands, Belgium and Japan.

This industry opens up more opportunities for growth than the apparel or even the electronics industries. This is because, first of all, demand for these products in the United States continues to expand quite rapidly and, second, because producers in Costa Rica and the Dominican Republic still have some headroom for boosting national value added by, for example, conducting sterilization processes, which many of them have not yet taken up. In addition, the transition in Costa Rica towards higher value-added segments is making room for other, lower-wage countries to join in. The Nicaraguan government, for one, has already identified this strategic move as a priority.

(d) From call centres to high value-added services

Throughout the world, the growth of service exports is outpacing the expansion of goods exports, and Central America and the Dominican Republic are no exception. As can be seen in figure III.5, service exports are concentrated in Panama, Costa Rica and the Dominican Republic, which are also the only three economies in the subregion that consistently mark up a surplus on their services trade account.

Figure III.5
Central America (6 countries) and the Dominican Republic: service exports, 2005-2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Monetary Fund (IMF).

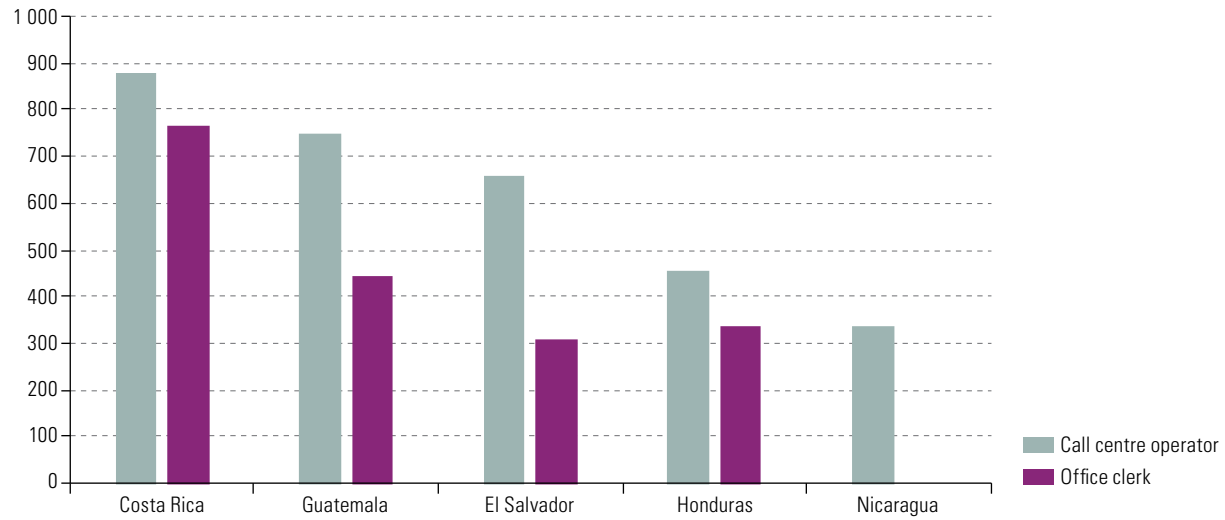
Service exports can be divided into two main categories: traditional services (transport, travel, financial services and so forth), which still make up the lion's share of these countries' exports,[5] and "new services", which are types of services that used to be untradable but which, thanks to modern communications technologies, can now be provided remotely. This latter category is the subject of this section.

The official statistics on these new services differentiate between business services and information services (as well as intellectual property royalties and financial services), but for purposes of analysis, it is useful to divide them into three categories, in increasing order of complexity and value added: information technology outsourcing (ITO), business process outsourcing (BPO) and knowledge process outsourcing (KPO). For the most part, Central America and the Dominican Republic are involved in the first two types of these services; only Costa Rica has made inroads in the third category.

Telecommunications services, which include call centres, are the segment with the least value added and the easiest one for firms from any country to enter. These activities are extremely sensitive to wage costs and do not require highly educated workers, but workers must still be more educated than the workers required by most exporting manufacturers. Their pay levels are lower than those offered in developed countries, but they are higher than the wage commanded by an equivalent skill level in the local market (see figure III.6). All the countries in the subregion have active industries in this field except Costa Rica, which is no longer competitive because of its higher wage levels, and almost all of the companies are foreign.

[5] The category of traditional services also includes services associated with manufacturing activities. The value added by companies operating in the country to the products that they process and export but never own should be reported. This system is used by many maquilas. These kinds of firms play an exceedingly important role in Honduras (57% of total service exports), Nicaragua (29%) and El Salvador (24%).

Figure III.6
Central America (selected countries): average monthly wage of a call centre operator and an office worker
(Dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of WageIndicator.org [online] https://wageindicator.org/main and International Labour Organization (ILO).

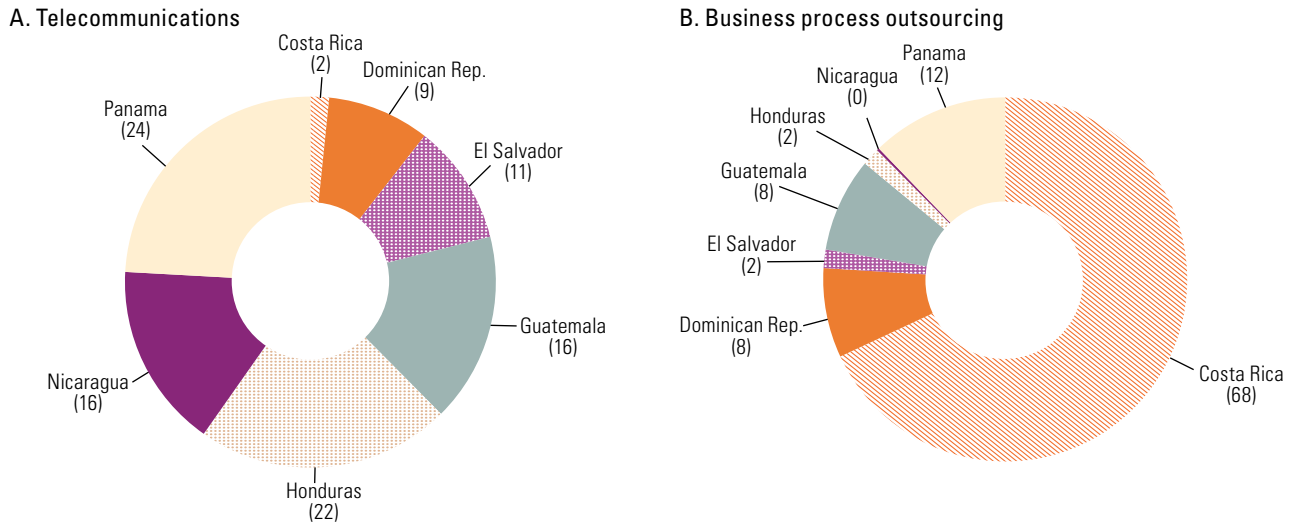
In Guatemala and El Salvador, for example, 90% of the persons employed in the services export sector (35,000 people in Guatemala and 25,000 people in El Salvador) work in call centres. The United States market accounts for most sales, followed by Mexico, Canada and other Latin American countries. The entry-level wage in these centres is around US$ 700 per month, versus between US$ 800 and US$ 1,000 in Costa Rica.[6] This sector is growing rapidly in both countries, with the only major constraint being the number of workers who are sufficiently fluent in English.

Costa Rica exports a much larger volume of business services than the other economies in the subregion (see figure III.7) and has scaled up its operations in this value chain to include increasingly sophisticated services. Its exports soared from US$ 100 million in 2000 to US$ 2.87 billion in 2016. As of 2017, a total of 157 companies were in operation (according to the figures compiled by CINDE) and were employing 61,595 people (10% more than in 2016). Costa Rica is also the only country in the subregion that exports a considerable volume of research and development (R&D) services (US$ 157 million in 2016, 60% of which corresponded to Intel) (Monge-González, 2017).

As is also true of the exporters of manufactured products, most of these companies are foreign-owned. In fact, half of them are what is known as "captive firms", i.e. they sell their services only to their parent company or headquarters, operating much like the shared services centres that Intel and Procter & Gamble have in Costa Rica. The rest (e.g. Teleperformance, a French company operating in Costa Rica, the Dominican Republic and El Salvador) offer their services on the open market. Yet even in the case of outsourced services, it is difficult for local firms to enter the market because they lack the type of knowledge that has been amassed by the transnational corporations and, most importantly of all, their contacts with big clients.

6 See [online] http://www.investinguatemala.org/sites/default/files/1-bpo_eng_3.pdf.

Figure III.7
Central America (6 countries) and the Dominican Republic: distribution of service exports, by country
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Monetary Fund (IMF).

When deciding whether or not to set up shop in a country, companies that offer new types of services look at the quality of the relevant infrastructure (telecommunications connectivity) and the overall business climate, but an even more important consideration is the quality of human resources/wage level equation. Human resource training is the area in which the countries compete the most with one another in this industry (ECLAC, 2017a). While the most important skill for workers in call centres is a good command of English, when it comes to more advanced services, other more specialized (e.g. legal, medical, accounting, computer) skills begin to take precedence.

In the case of Costa Rica, the workers trained in the country's technical universities and technical secondary schools have been of key importance in this respect. For example, 70% of the employees of one of the biggest service operators are graduates of technical secondary schools. The competition for workers having these profiles is fierce, and there are head-hunting teams that offer contracts to students who still have three years to go before graduating (Gereffi, Bamber and Fernandez-Stark, 2013).

Here again, as in the manufacturing export sector, linkages with the local economy need to be deepened (ECLAC, 2014a), and as these operations move up the value-added scale, opportunities open up for strengthening those links. After Intel set up an R&D centre in Costa Rica, for example, it began to buy engineering and software services in the local market, although it is true that general services and energy still make up three fourths of its local purchases.

Panama is a special case. This country's development strategy revolves around exports of services, and the level of its service exports is extremely high relative to the size of its economy. Most of these exports are in the traditional sectors of transport (45% of the total, with a large portion of them being linked to the operations of the Panama Canal), travel (35%) and financial services (10%, primarily in connection with the country's role as an offshore financial centre), but its exports of business and telecommunications services nonetheless amounted to over US$ 600 million in 2016.

Panama also has a very different strategy than other countries in the subregion for actively seeking to convince transnational corporations to establish their regional headquarters there.

B. Trade policy and investment policy working hand in hand

The development of these countries' export sectors has been supported by policies focusing specifically on two lines of action: the conclusion of trade agreements with the United States and the creation of FDI incentives.

1. Trade agreements as a means of diversifying exports

The use of trade agreements to guarantee access for Central American products to the United States began with the introduction of a production-sharing mechanism (Harmonized Tariff Schedule 9802) and the Caribbean Basin Initiative in the 1980s.

In the 1990s, the conclusion of the North American Free Trade Agreement (NAFTA) gave Mexican exports an edge and so put Central American and Caribbean exports at a disadvantage. This imbalance was lessened by the passage of the Caribbean Basin Trade Partnership Act in 2000 and then by the Central America–United States Free Trade Agreement (CAFTA) of 2004, which was later expanded to include the Dominican Republic, becoming the Dominican Republic —Central America— United States Free Trade Agreement (CAFTA-DR), which remains in force to this day. For the garment industry, for example, this latter agreement ensures untrammeled access for any piece of clothing made from fabric produced in any of the countries that are party to the agreement (mainly the United States), Mexico or Canada. For a span of 10 years, Nicaragua had a special quota for exports of clothing made out of fabric produced in Asia; this measure was seen as a means of supporting the development of the industry in that country, yet the termination of that special trade preference at the end of 2016 was not followed by any dip in its exports.

Now only Haiti continues to have the privilege of using Asian fabric in wearing apparel made for export, thanks to a unilateral measure taken by the United States as part of its aid policy for that country. This helped the country to develop this industry to some extent in Haiti by helping to compensate for its disadvantages in terms of infrastructure, local capacity and the business environment (see box III.2).

Guaranteed access under CAFTA-DR is a clear advantage for Central American and Dominican export industries, especially vis-à-vis Asian exporters; as will be seen later on, any erosion of that advantage could pose a serious threat to the continued existence of those industries.

The countries of the subregion are heavily dependent on the United States market. In the case of manufactures, they rely on the United States market almost entirely, with 90% of their clothing exports going to the United States. In the case of El Salvador, for example, the next most important market is that of Honduras, followed by Mexico and Nicaragua, but these are probably the next stages in the value chain rather than final markets. The automotive wiring harnesses produced in Nicaragua and Honduras are exported to the United States or to Mexico, where they are used in the assembly of vehicles that will ultimately be sold on the United States market. In all of the major value chains, almost all of the end users reside in the United States.

Box III.2
The HOPE law for Haiti, or trade policy as a vehicle for humanitarian aid

In 2006, under the Caribbean Basin Initiative, the United States passed the United States Haitian Hemispheric Opportunity through Partnership Encouragement Act (HOPE), which provides enhanced trade preferences to Haiti. In 2010, in the wake of the earthquake that devastated much of that country, these preferences were expanded under the Haiti Economic Lift Program Act (HELP). In 2015, this programme was extended up to 2025.

These preferences are provided subject to a continuing improvement in working conditions in the factories producing exports bound for the United States, which are monitored by a joint World Bank/International Labour Organization programme.

The main privilege granted under this law that is not afforded by the Dominican Republic —Central America— United States Free Trade Agreement (CAFTA-DR) has to do with local content rules. In practice, this means that plants located in Haiti can make up clothing out of fabric imported from China, rather than having to use cloth produced in the United States or another CAFTA-DR member country. This trading privilege has played a pivotal role in the development of the clothing assembly industry in Haiti, which has doubled its sales to the United States since the implementation of the HELP initiative.

In 2016, Haiti made US$ 849 million in clothing sales to the United States, which amounts to 90% of its total exports and 10% of its GDP, and this industry employed 40,000 people, two thirds of whom were women. Exports were down slightly in 2016 and have not picked up since then, but in 2017 a number of new investments were announced and the Caracol Industrial Park was developed as a major free trade zone.

Despite this industry's growth, Haiti supplies just 1% of the United States' clothing imports, which means that it is out-performing the Dominican Republic, but has a smaller share of that market than Guatemala, El Salvador, Honduras and Nicaragua.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Labour Office/International Finance Corporation (ILO/IFC), *Better Work Haiti: 14th Biannual Synthesis Report Under the HOPE II Legislation,* April 2017 and World Trade Organization (WTO), "Trade Policy Review – Haiti", 2015 [online] https://www.wto.org/english/tratop_e/tpr_e/tp427_e.htm.

No aggregate data on the destination markets for new types of export services are available, but the information published by individual companies would seem to indicate that they are also heavily concentrated in the United States market, although less so than manufactures.

The Central American countries and the Dominican Republic have been working to diversify their exports and, to that end, have signed trade and integration agreements with various other countries, including a number of Latin American nations, and an association agreement with the European Union. This latter agreement entered into force in January 2014 and covers six Central American economies —the Dominican Republic is included in the agreement signed between the European Union and the Caribbean Forum of African, Caribbean and Pacific States (CARIFORUM). Under the agreement between the European Union and Central America, 69% of Central America's products have free entry to the European market, and the tariffs on the remainder will gradually be rolled back.

In overall terms, the association agreement between Central America and the European Union does not appear to have had any impact. Trade flows between the two weakened during the two years following its conclusion at about the same rate of decline as was seen in world trade as a whole. There is one notable exception, however: Costa Rica's sales of medical equipment to Belgium and the Netherlands climbed to US$ 265 million in 2016, which was more than double their level in 2012, and sales to Japan and other developed countries have been on the rise as well. This has reduced this Costa Rican industry's reliance on the United States market from 95% in 2000 to 74% in 2016. Meanwhile, 90% of the Dominican Republic's exports of medical equipment continue to be destined for the United States.

2. Trade free zones and other investment policies

In order to drive the development of these export industries, guaranteed access to the United States market had to be coupled with inducements for foreign investors. In the 1990s, FDI-friendly regulations were introduced in all the economies of the subregion and specialized agencies were set up to attract investors, such as the Costa Rican Investment Promotion Agency (CINDE), the Foreign Trade Corporation of Costa Rica (PROCOMER) and the Investment Promotion Office of the Dominican Republic[7] (ECLAC, 2004). Almost all the sectors of these economies have remained open to FDI ever since, and efforts have been made to liberalize and improve the business climate in order to attract more investors.

Starting in the 1970s and especially from the 1980s on, all the Central American countries and the Dominican Republic began to establish free trade zones as a means of promoting their export industries. These defined geographic areas[8] are regarded as being outside the customs area of the country in question and are subject to special types of regulations. In the beginning, they were meant to help offset the anti-export bias exhibited by these economies at the time, which applied high tariffs to intermediate and capital goods. Later on, they began to offer customs, regulatory and, most importantly, tax benefits to export industries and thus became the countries' main tool for attracting investment.

Some 10 years ago, the World Trade Organization (WTO) decided that these countries' free trade regimes contravened the Agreement on Subsidies and Countervailing Measures. The Central American countries were given time to adapt their regulations, but by the end of 2015 most of them had had to modify their regimes in order to do away with any measure that could be regarded as an export subsidy. Nicaragua and Honduras are temporarily exempted from this obligation and can leave their existing regulations in place for the time being so long as their gross national product (GNP) does not exceed (for three consecutive years) US$ 1,000 per capita. The ban on export subsidies does not apply to services, which are covered by the General Agreement on Trade in Services (GATS) (Martínez Piva, 2015).

Costa Rica, the Dominican Republic, El Salvador, Guatemala and Panama have therefore been amending the relevant laws and regulations (Martínez Piva, 2015; WTO, 2016a and 2016b). All of them have chosen to eliminate the requirement that only exporters can avail themselves of the benefits afforded by their free trade zones, so those benefits are now extended to any industry that belongs to one of the sectors that the country in question has designated as being of strategic importance (see table III.4). Thus, companies in the free trade zone can now sell their products in the country if they so desire, although very few actually do so because the local markets are so small. In addition, the General Treaty on Central American Economic Integration expressly excludes intraregional trade in products from free trade zones, which hampers the creation of subregional production linkages.

7 This agency's work was later taken over by the Export and Investment Centre of the Dominican Republic (CEI-RD).

8 Some countries allow companies located outside the zones to operate under the free trade regime. Others use inward processing warehouse schemes for such firms.

Table III.4
Central America (6 countries) and the Dominican Republic: main export incentives

Country	Eligible sectors	Total exemption from income tax	Exemption from municipal taxes	Exemption from duties and value added taxes	Geographic component
Costa Rica	Service exports, high-technology manufactures, life sciences (including medical equipment), research and development (R&D)	8 years but can be extended indefinitely if substantial reinvestments are made	Permanent	Permanent	A further 4 years of exemption for investments outside of San José
Dominican Republic	Manufactured and service exports	15 years	15 years	15 years	Trade free zones along the border have a 20-year tax exemption
El Salvador	All manufactures (chapters 3 and from 25 on of the Harmonized Commodity Description and Coding System)	15 years	15 years	Machinery, raw materials and other inputs	A further 5 years of exemption for investments outside of San Salvador
Guatemala	Textiles and apparel, remote business services	10 years	10 years	10 years	No
Honduras	Unspecified	12 years	Permanent	Permanent	No
Nicaragua	Unspecified	10 years; can be extended for another 10 years	Permanent	Permanent	No
Panama	Manufactures, assembly and high-technology; logistical, environmental and health services; higher education	Permanent	…	Permanent	No

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official information from the respective countries.

As can be seen from table III.4, the biggest advantage enjoyed by these sectors is their exemption from income tax, customs duty and the value added tax (VAT). These benefits clearly cut into government tax revenues, especially as companies in the free trade zones come to play a larger role in the economy. Although their cost in forgone tax receipts is difficult to quantify, the World Bank has estimated that corporate tax incentives (including all companies, not just exporters) have reduced the Dominican Republic's tax intake by the equivalent of 39% of GDP (World Bank, 2018).[9] Given their extremely high fiscal cost, the effectiveness of these incentives is as yet unclear. The results of a number of surveys of transnational corporations indicate that tax incentives are not one of the foremost considerations when they are choosing a location, however. Instead, they place greater weight on political stability, regulatory quality and market size, although it is true that tax incentives are certainly taken into account in the final stages of the decision-making process (World Bank, 2018).

It is also true that tax incentives are much more of a consideration for efficiency-seeking corporations than they are for enterprises that are mainly looking to expand their markets or to obtain access to raw materials. Over half of the corporate respondents to one survey conducted in Nicaragua said that they would have invested in the country even without the tax incentives it offered, but that figure dropped to 15% for firms in the free trade zones (James, 2013). This makes it difficult for the governments of the Central American countries and the Dominican Republic to reduce the tax incentives that they offer to exporters, especially since these governments are often competing against one another for the same investment projects. The Costa Rican government has estimated that the contribution made to the country's economy by the companies operating in its free trade zones amounted to US$ 3 billion (5% of GDP) in 2015; most of this amount was in above-average wages, local procurement and indirect job creation.

[9] For purposes of comparison: total direct taxes in the Dominican Republic provide revenues equivalent to just 4.7% of GDP. The same study that yielded this finding indicated that tax incentives were even more costly in Cambodia (5.9% of GDP) and Ghana (5.2% of GDP).

Given this situation, it would be preferable to use tax incentives that have a direct impact on companies' costs rather than ones that do away entirely with income taxes. Some examples would be deductions for expenditures on R&D or on staff training or differing rates of accelerated depreciation of certain capital goods (see table III.5). Clearly, modifying existing incentives in this way will require the governments to improve upon their implementation capacity and to coordinate with each other in order to avoid being drawn into an "incentives war" as they compete for investment projects.

Table III.5
Pros and cons of two types of tax incentives

Income tax incentives - Tax moratoriums. - Reduced (or even zero) income taxes.	
Pros	**Cons**
- They send a clear signal to investors and are easily explained.	- They are more beneficial for more profitable projects, which would probably make investments even in the absence of such incentives. - They are provided on an ex ante basis, so they cannot be predicated on job creation or investment performance. - They facilitate aggressive tax planning on the part of transnationals (profit shifting). - Their fiscal cost may be very high and is difficult to predict.
Cost-reducing tax incentives - Income tax deductions for the cost of certain investments. - Accelerated depreciation of certain kinds of fixed assets.	
Pros	**Cons**
- The benefit for the investor is directly proportional to the actual investment. - The fiscal cost is more predictable. - There is less likelihood of benefits being diverted to other countries. - Reporting obligations help to ensure greater transparency.	- They are more complicated to administer. - They may act as an incentive for more capital-intensive investments.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, *Global Investment Competitiveness Report 2017/2018: Foreign Investor Perspectives and Policy Implications*, Washington, D.C., 2018.

Aside from tax incentives, the other policies that governments may use to attract investments in their export sectors can be grouped into two main types: those aimed at reducing information asymmetries between foreign and domestic investors, and those that are designed to lower corporations' production costs.

Providing information to foreign investors is the job of investment promotion agencies; the work of these offices, which is often underappreciated, is actually one of the most cost-efficient policy tools available in this area (Harding and Javorcik, 2011). In Central America, these agencies, which have a relatively prominent political profile and are often attached directly to the Office of the President, have played an important role in attracting investment to strategic sectors. The case of Intel in Costa Rica underscores how influential a good promotional campaign and direct contacts with the firm in question (coupled with a generous incentive package) can be.

The second type of policy, aimed at reducing these industries' production costs in other ways, apart from the tax exemptions or benefits mentioned above, includes a series of measures designed to clear up the bottlenecks that plague these industries. Examples include government efforts to undertake infrastructure works that are specifically designed to facilitate the exportation of manufactured products and clearance through customs. In terms of human resources, which is an increasingly important factor in the growth of export services, targeted measures include the subsidized English classes offered by the Salvadoran and Dominican governments to prepare people to work in call centres and the Caribbean Regional Communications Infrastructure Programme

that Nicaragua is running with the support of the World Bank, which is providing training in computer skills and English-language instruction to 5,000 people. When El Salvador began to offer a "full package" scheme in the apparel industry and it became evident that the cost of electricity was a significant consideration, it took steps to bring about the diversification of electrical power generation capacity.

Panama has a number of programmes focusing on the attraction of investment in high-technology sectors and, as part of that effort, allows companies that set up operations in the City of Knowledge —a centre for entrepreneurial, academic, scientific and humanistic cooperation and exchange— to bring in as many foreign workers as they wish. Transnationals that establish an office in the country are also offered income tax exemptions for their employees.

C. Export-oriented industries and future challenges

Efficiency-seeking FDI is particularly difficult to attract and maintain because the corporations using this kind of strategy are constantly looking for other locations that afford greater efficiency. In the more capital- and knowledge-intensive industries, such as the automotive industry, the competition among different locations is lessened by the high sunk costs involved; in light manufacturing, such as the manufacturing activities found in Central America, it is easier to move production facilities from one location to another and, in fact, these plants expand and cut back on their production capacity fairly frequently. In fact, some industries have arrived and then left countries of the subregion in the space of less than 10 years.

Export industries in Central America have always been faced with international competition, and they have evolved within that environment. Over the past two decades, competition from Asia and technological changes have shaped these industries' development path, resulting, first, in a decline in the market share of the apparel industry and, then, in an expansion of services exports. In the near future, two factors may prove to have a decisive influence on these industries' chances of survival: the retention of preferential access to the United States market, and the possible mechanization of labour-intensive production processes.

1. The loss of United States trade preferences would pose a threat for many sectors

Central America's export industry was born and has grown with a focus on the United States market and, even today, over 80% of its apparel, medical equipment and electronics exports are destined for that country. Its dependence on that market makes it highly sensitive to any shift in its trading partner's demand structure, as was seen during the 2009 recession, which triggered major job and production losses throughout the subregion. Even more significantly, the subregion's competitive edge over its main competitors in that market is largely based on the lower tariffs it enjoys under CAFTA-DR.

The five largest apparel exporters to the United States are Asian countries: China, Viet Nam, Bangladesh, Indonesia and India, in that order. The products of the apparel industry in these countries are subject to tariffs of 18%, 20%, 17%, 21% and 15%, respectively, whereas the tariffs on goods from Honduras, El Salvador and the Dominican Republic are less than 1% and those applied to Guatemala and Nicaragua amount to

6% and 7%, respectively (ECLAC, 2017a). If the conditions governing entry into the United States market were to be made the same across the board, the apparel industry in Central America would obviously find itself in great difficulty.

For example, if the United States had signed the Trans-Pacific Partnership (TPP) Agreement, wearing apparel produced in Viet Nam would have received a 50% tariff reduction for entry into the United States market (Cordero, 2016). This tariff cut would have been coupled with a requirement that Viet Nam use thread and fabrics made in other TPP member countries, which would have obliged the Vietnamese industry to reorganize and do without the inputs from China that it currently uses. Nonetheless, any agreement along these lines would deal a heavy blow to the industry in Central America; as one of the main producers in Honduras put it: "Should the TPP agreement or any other new free trade agreement come into force in the future, this may negatively affect our competitive position in the various other countries in which we sell our products".[10]

The renegotiation of NAFTA that is now under way raises the possibility of an overhaul of CAFTA-DR as well, although, for the time being, the United States executive branch has limited itself to vague statements to the effect that this and other regional agreements "need to be modernized, more or less".[11] It should be noted, however, that the industries in the United States that are directly affected by CAFTA-DR are much smaller and less influential than those that are impacted by NAFTA. The textile and apparel industry in the United States, for example, represents just 0.2% of its GDP.

There are opportunities for diversifying into other markets, and the strong increase in Costa Rica's medical equipment exports to Europe and Japan in recent years is a promising sign, although the fact remains that 76% of its output is still sold to the United States. It is also very difficult to escape the fact that the geographic proximity of the United States will invariably give rise to a strong preference for that market, at least for exports of goods.

In the long run, regardless of the type of access provided under free trade agreements, the concentration of sales in a developed market limits the available headroom for expansion, especially in the apparel industry, which cannot reasonably expect any notable upswing in demand in the United States whereas demands could rise significantly in other Latin American and Caribbean countries.

2. Automation could undercut Central American export industries

The free trade zones of Central America specialize in labour-intensive activities and have always been vulnerable to increased labour costs or the entry of nations where wages are lower. The countries of the subregion have succeeded in adapting to this situation by withdrawing from sectors where they have ceased to be competitive, embarking on new production activities, such as exports of services, and exploring new (e.g. the full package scheme) business models. The automation of what are currently labour-intensive industrial and service production processes could pose a potentially more destructive threat, however, because it could entirely eliminate the need to offshore production processes to countries with lower labour costs. This seems like a nearer-term possibility now than it once did owing to recent technological developments that are giving rise to worldwide concerns about the prospect of huge numbers of workers being made redundant.

[10] Statement made on the annual information form (SEC Form 40-F) filed by the Canadian firm Gildan Activewear Inc. with the Securities and Exchange Commission (SEC) of the United States on 24 February 2017. See [online] http://www.gildancorp.com/documents/Annual-information-form-for-the-year-ended-January-1%2C-2017/Annual.Information.Form.ENG.pdf.

[11] Statements made by the United States Trade Representative Robert Lighthizer to Congress (*Inside U.S. Trade*, 2017).

Numerous studies have sought to gauge how many jobs may be lost to automation. Frey and Osborne (2013) have estimated the probability of a given task becoming automated based on how necessary manual dexterity or manual skills, creative intelligence or social intelligence are for its performance. According to their calculations, 47% of all jobs in the United States are at high risk from automation. The same methodology yields even higher figures when applied to developing countries: 56% of all jobs in the member countries of the Association of Southeast Asian Nations (ASEAN) (Chang and Huynh, 2016) and as much as 70% in some low-income countries (World Bank, 2016). In Costa Rica, an estimated 52% of jobs in the private sector are at risk from automation (CINDE, 2018).

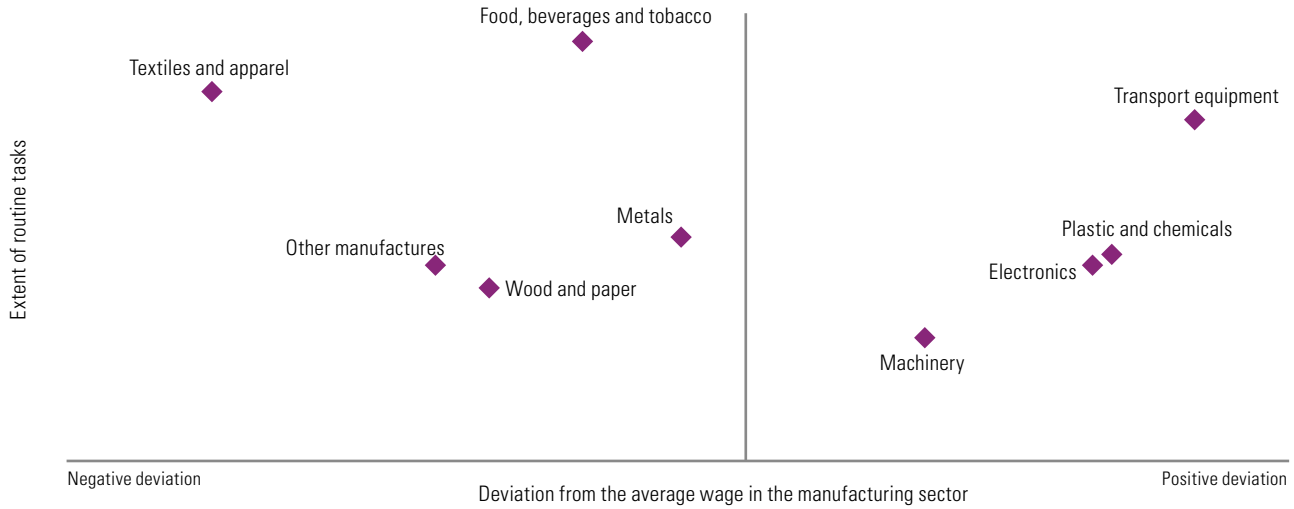
Yet each job involves a series of activities, some of which could be automated while others cannot be. Taking this factor into consideration, Manyika and others (2017) estimate that only 5% of existing jobs can be fully automated but that at least 30% of the activities involved in the performance of another 60% of all jobs could be automated using technologies available right now. This distinction is significant, because it means that, in the case of most jobs, automation will not completely take the place of human workers but that, instead, workers will be supplied with more sophisticated equipment that will enable one employee to do the work that used to be done by several employees or more.

A number of different factors will determine how automation is introduced in each industry and each country, starting with the technical capacity for the implementation of a given task without human intervention, but also including implementation costs, the economic benefits (which are not limited to savings on wages), policies and regulations, social acceptability and labour market conditions.

This latter point is especially relevant for Central America and the Dominican Republic because it raises the issue of the relationship between the technical capacity for automating clothing assembly and other light manufactures, on the one hand, and the economic profitability of doing so, on the other. If the analysis is based on how routine the tasks performed by workers are, then the clothing assembly industry is one of the ones that is most prone to automation, but there are other industries in which wages are much higher and in which workers' tasks are nearly as routine as they are in the clothing industry (Squicciarini, Marcolin and Miroudot, 2016). If the equation used to compute the potential savings includes both the technical capacity for mechanizing a task and the average wage of the workers who would be replaced, then the automotive industry is much more likely than the clothing industry to be automated in the near future (see figure III.8) (UNCTAD, 2017). And, in effect, the automotive industry is currently the one in which the most robots are being used. In fact, the Mexican automotive industry has doubled the number of vehicles it produces over the past decade without expanding its workforce almost at all.

It is difficult to know how close the production processes currently being conducted in Central America and the Dominican Republic are to becoming automated. In the case of the clothing industry, the robots that are the closest to being produced on an industrial scale are those being made by SoftWear Automation (see box III.3). Given the present cost of these robots and assuming an annual increase in performance of 8%, it is possible to estimate the point in time at which that cost will be on a par with labour costs in the countries of the subregion (assuming an increase in labour costs of 3% per year) (see figure III.9). That turning point is fast approaching for Brazil and Mexico but, for Honduras, which is the subregion's largest clothing exporter and has one of the lowest wage levels, that point is still quite far off.

Figure III.8
Relationship between the economic potential for automation and the extent to which workers perform routine tasks in various manufacturing industries



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Conference on Trade and Development (UNCTAD), *Trade and Development Report 2017*, 2017 [online] http://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=1852.

Note: No numerical scales are shown on the axes in order to illustrate the proximity of the relationship between these factors. The data are for a sample of 20 of the member countries of the Organization for Economic Cooperation and Development (OECD): Austria, Belgium, Canada, Czechia, Denmark, Estonia, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Poland, Republic of Korea, Slovakia, Spain, Sweden, United Kingdom and United States. The extent of routine work involved corresponds to the period 2011-2012; mean wages are the average for 2008-2014.

Box III.3
When will there be a robot that can sew clothes?

Making a piece of clothing involves four basic operations: taking a piece of fabric, aligning it carefully, sewing it (using a sewing machine) and removing it from the machine. This is what hundreds of thousands of persons around the world do over and over, and it seems incredible that such a widely performed, routine task has not been automated yet. The main difficulty is that cloth is soft, so machines cannot handle it efficiently. One of the strategies for dealing with this problem that is being tried out is to treat the cloth chemically in order to temporarily make it rigid so that it can be dealt with as if it were wood or metal.

Another strategy is to equip robots with cameras that can guide them as they handle the cloth in much the same way as cameras are used to guide self-driving cars. This is the route chosen by SoftWear Automation, a United States firm that has taken the lead in this field and is on the verge of moving into large-scale implementation. The Chinese company Tianyuan Garments, which produces clothes for major brands such as Adidas and Armani, has invested US$ 20 million in a plant in Arkansas (United States) that is run using 21 SoftWear Automation robots. The plant is expected to come on line in 2018 and to have a production capacity of 1.2 million t-shirts per year.

The manufacture of athletic shoes is a higher-value-added segment than wearing apparel is, and Nike has already managed to automate the sewing of the various pieces that go into making these shoes. Since 2015, Nike has been working with a high-tech firm called Flex in a plant located in Mexico to automate the production of its exclusive Flyknit line. This revolutionary process includes the automatic gluing of different pieces and the use of lasers to cut the pieces. The firm's main competitor, Adidas, launched its Speedfactory in October 2017 in Germany, where it uses robots and 3-D printers to manufacture athletic shoes, although so far on a quite small scale.

Citibank analysts estimate that if the firm were to automate the production of its Nike Air Max model (which is made and bought on a much larger scale), it could realize a 50% saving on labour costs and a 20% saving on the cost of materials (because of the machines' greater precision), which would boost its profit margin by 12.5%.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of J. Bissell-Linsk, "Nike's focus on robotics threatens Asia's low-cost workforce", *Financial Times*, 22 October 2017 [online] https://www.ft.com/content/585866fc-a841-11e7-ab55-27219df83c97; Ch. Ruvo, "The Sewbots Are Here", Counselor, 15 January 2018 [online] https://www.asicentral.com/news/web-exclusive/january-2018/the-sewbots-are-here/; Insider, "This insanely fast robot will make Adidas shirts cheaper - and kill hundreds of jobs", 7 August 2017 [online] https://thenextweb.com/insider/2017/08/07/this-insanely-fast-robot-will-make-adidas-shirts-cheaper-and-kill-hundreds-of-jobs/ and TODAYonline, "Robots stitching up workers in emerging economies", 19 July 2017 [online] http://www.todayonline.com/world/robots-stitching-workers-emerging-economies.

Figure III.9
Projection of labour costs in Brazil, Honduras and Mexico and the cost of robots for use in the apparel industry, 2016-2033
(Dollars per hour)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of H. Sirkin, M. Zinser and J. Rose, *The shifting economics of global manufacturing: how cost competitiveness is changing worldwide,* The Boston Consulting Group, August 2014; and The Conference Board, "International comparisons of hourly compensation costs in manufacturing, 2015".

Note: For the robot cost curve, an 8% annual improvement in performance is assumed; the shaded areas traces the curve when the improvement is assumed to be 15% per year.

Automation also poses a threat to service exports, precisely because shared services centres base their strategies on their ability to standardize business processes and organize them into modules that can then be provided to their clients more efficiently. This type of business model constitutes a first step towards automation.

There are two types of technological approaches to automation in this sector: robotic process automation (RPA), which is already being implemented in many areas, and the more advanced artificial intelligence applications, of which there are as yet very few.

RPA involves the use of a software application that can take the place of a computer operator to open numerous applications, extract data, transfer data from one application to another, produce standardized reports and so forth. RPA is commonly being used in financial services to process insurance claims, reconcile financial statements or resolve credit card disputes. One of its main strong points is that it is fairly easy to install (it can be installed for a single user rather than being limited to a company-wide system). An individual license can cost between US$ 5,000 and US$ 15,000, although the total implementation cost may vary depending on the complexity of the tasks involved.

RPA is a proven solution, and various studies refer to savings of as much as two thirds of total costs for certain service industries. Hewitt (2018) looked at two companies in Costa Rica that are using RPA and reports that both of them achieved strong productivity gains but did not lay anyone off. Generally speaking, firms that implement RPA more fully do not lay off more than 50% of their back-office staff.

There is no question about the fact that automation will have an impact on remote service provision in Central America, but the effect of many technological developments tends to be exaggerated in the short run (Gartner, 2016) because people often fail to take into account all the various obstacles that hinder their implementation, such as cost, the availability of the human resources needed to implement them, regulations and opposition from staff or clients. Experiences with automation to date indicate that automated systems have complemented, rather than displaced, workers in both the manufacturing and services sectors. Robots have been seen as a way of freeing workers from the most routine types of tasks and allowing them to concentrate on activities that require more judgment. This generates a demand for workers who have more problem-solving, critical-thinking and statistical analysis skills, so the more highly skilled workers are more likely to remain employed rather than being displaced. At the same time, there will be a greater demand for people with the social skills required to work as part of a team and to interact with clients; these are the kinds of tasks that have thus far been the most resistant to automation. In fact, it may be that the lowest-paid workers in call centres may turn out to be less prone to automation than those who provide outsourced business services.

But even if the more labour-intensive activities are able to stave off automation in the medium term, this does not mean that the countries specializing in these areas will not be affected. The automation of more capital- and knowledge-intensive segments and industries may close off opportunities for them to scale up to these activities since, once they are automated, it is less likely that these activities will be offshored to developing economies. For the time being, there is no evidence that any manufacturing or services exporters are reshoring their activities (UNCTAD, 2017), but this may curtail the common practice of offshoring segments of production activities that would have been less competitive in developed countries if they had not become automated. It is a telling sign that the first factory to use robotic sewing machines on a large scale (see box III.3) is set to open in the United States rather than in Central America or Asia. And, in fact, SoftWear Automation, the firm that is building these robots, draws attention to the possibility of using production sites that are close to potential customers as one of the key advantages of its product.

D. Conclusions

FDI in light manufactures and services for export has been a major driver of economic development in the Central American countries and the Dominican Republic thanks to the creation of formal-sector jobs, many of them filled by women, commanding above-average wages. On the other side of the coin, these generally low-technology operations generate little value added because they have a high import content, and they have few linkages with the rest of these economies. In addition, the opportunity to create local industrial groups based on these industries has not been taken advantage of, and these industries have not diversified their exports away from the United States market.

New export services have grown rapidly in recent years, but, with the exception of plants in Costa Rica and, to some extent, Nicaragua, free-zone exporters of manufactures have not managed to expand employment or production during the past decade. They

have, however, succeeded in adapting their operations in order to fend off growing competition from Asia. In the case of the apparel industry, this has been done by shifting its business model towards "full package" schemes; Costa Rica and the Dominican Republic, for their part, have coped with Asian competition by developing medical equipment industries, while Nicaragua and Honduras have turned to the manufacture of automotive wiring harnesses. These changes have resulted, albeit in some cases to a limited degree, in increases in local value added and export diversification.

Yet even as these countries are moving into higher value-added and more technologically sophisticated activities, they continue to face strong international competition. Fixed costs are significant in these sectors, the domestic market is very small, and the role played by local firms is almost negligible, which means that transnationals will invariably be thinking about seeking out other locations if relative costs rise or if a shift occurs in global demand, as happened in the case of the Intel plant in Costa Rica. This has obliged all the governments of the subregion to offer very generous tax incentives, some of which have not always been carefully weighed or considered.

These incentives are said to be necessary in order for these industries to remain competitive, but they may not be the best kind of inducement to move these industries towards higher-technology operations. Exempting these industries from all taxes, as is done today, might even be economically justified at present, but, as a policy tool, it is too indiscriminate to target the types of investments that will boost production capacity and guide these manufacturing and service activities towards more complex processes that will allow them to remain competitive in a changing technological environment.

So far, these countries have offered an efficient package of fairly low wages, a favourable business climate and ready access to the United States market. This preferential access could be threatened, however, if the United States Government decides to renegotiate CAFTA-DR, and the advantage offered by low wages will be eroded by increasing automation. Although everything seems to indicate that the automation of the apparel, medical equipment and remote business services industries will be quite gradual, as is already occurring in the automotive industry, the fact remains that if the segments of the value chain that are sited in Central America cease to be labour-intensive, then companies may decide to concentrate their production operations in the United States or other developed countries. In the light of these factors, the countries of the subregion should devote greater attention to training their workforce and to fashioning an industrial structure capable of undertaking more complex types of operations and an innovation system that will attract investment in new modes of production.

It is difficult to predict what kind of impact technological developments will have on these industries. Up until now, the Central American countries and the Dominican Republic have succeeded in adapting to major shifts in their competitive position, but they will need to make greater headway in forming a more highly trained workforce if they are to cope with the challenge posed by automation.

Costa Rica, the Dominican Republic and Panama are among the economies that have grown the most in recent years, and El Salvador, Guatemala, Honduras and Nicaragua have also grown, in part thanks to the export industries that they have fostered. The economic buoyancy seen in the past few years has opened up a window of opportunity for the implementation of policies that will help to prepare the Central American and Dominican export industries to face up to new challenges as they arise.

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CHAPTER

IV

The European Union, the main source of quality investment for Latin America and the Caribbean

A. Foreign direct investment by countries of the European Union[1] in Latin America and the Caribbean

Taken together, the countries of the European Union are the largest source of foreign direct investment (FDI) in the word. Between 2009 and 2016, that is, from the time of the global financial crisis up to the last year for which data are available, yearly FDI outflows from the European Union countries averaged some US$ 400 billion, or 34% of the global total. By comparison, over the same period annual FDI outflows from the United States averaged around US$ 300 billion, those from Japan, US$ 110 billion and those from China, US$ 100 billion.

It is also true that a large part of these amounts (28%, estimated from project announcements between 2010 and 2017) went to other countries within the European Union itself. Investments in Asia-Pacific countries represented another 25% of the total, while those in Latin America and the Caribbean represented 13%, according to the same estimate (see figure IV.1).

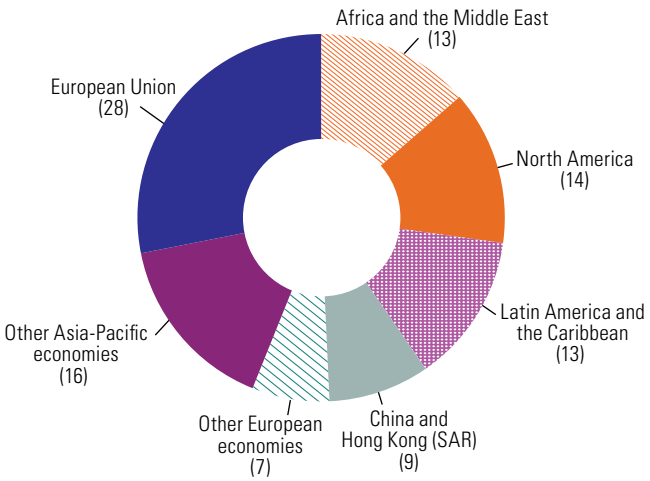


Figure IV.1
European Union: distribution of FDI announcements by destination region, 2010-2017
(Percentages of total amount)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] https://www.fdimarkets.com.

There is a long tradition of investment by transnational corporations from the European Union in Latin America and the Caribbean, since the times of export development, when these firms had a major presence in the primary sector, but also in infrastructure sectors such as railways.

During the decades of the import substitution model, investments were concentrated in manufacturing, including motor vehicle manufacturing, food and beverages, and chemicals, and especially in the larger economies: Brazil, Mexico and Argentina. In fact, until the market opening of the 1990s, these three countries accounted for 75% of total European FDI stock in the region. Before market opening, the main investor countries in the region were the United Kingdom, Germany, France and, to a lesser extent, Italy and the Netherlands (ECLAC, 2002).

[1] Because this chapter concerns FDI from the European Union in the region, any reference to Europe or the European countries refers to the group of the 28 member countries of the European Union, unless stated otherwise.

During the 1990s, complementary economic conditions in Latin America and Europe made for a large rise in FDI flows. In Latin America, structural reforms made to expedite international market positioning led to the elimination of many foreign capital controls in sectors that had hitherto been the domain of State enterprises, such as hydrocarbons, mining and services. FDI inflows surged as never before and, as a result of privatization, many European firms moved into sectors that had previously been closed to them.

Meanwhile, in Europe, the advent of the single market was pushing companies to expand and become large enough to compete in the Community market. In response to this challenge, many firms opted for overseas expansion through mergers and acquisitions and many seized the opportunities on offer in Latin America.

In the second half of the 1990s, the European Union thus became the main source of FDI inflows to Latin America and the Caribbean. At the same time as firms from Germany, the United Kingdom, France and the Netherlands were strengthening their positions in Latin American markets, the new conditions allowed the entry of new actors, mainly from Spain and Portugal. As a result, Latin America and the Caribbean became the main destination for European investments in emerging and developing economies and their second largest non-European destination after North America. For example, over 80% of Spanish and Portuguese investment in emerging markets went to Latin America and the Caribbean. That same proportion varied between 40% and 50% in the case of investments originating in Germany and the Netherlands, and was around 20% in the cases of the United Kingdom, France and Italy (ECLAC, 2002; Dunning, 2001).

Today, around 40% of the FDI stock in the region's largest economies comes from European countries, more than from any other origin. Latin America represents 11% of the entire overseas assets of European transnational firms, almost the same percentage as Asia (13%) —a far larger region— and much more than Africa (4%).

The close investment relationship between the two regions was tested in the years following the financial crisis of 2008 and 2009, when the Latin American and Caribbean economies posted high growth rates while most of the European countries were sunk in recession. Some European transnationals, especially from Spain and Portugal, were badly affected by the performance of their home-county economies and had to reduce their investment in the region. Although a number of these firms were forced to sell off some of their subsidiaries in the region, in general these were only peripheral assets and no major European firm abandoned its investments in Latin America as a result of the crisis. On the contrary, many European firms found their Latin American subsidiaries becoming their most profitable business, which solidified the subsidiaries' position within the respective group and vindicated the investment strategy begun in the 1990s.

During the recent decade, new opportunities have again begun to arise in Latin America. Many European firms have taken this opportunity to diversify their income sources and, sometimes, to help withstand the conditions in home markets that are sluggish or in outright recession. At the same time, Europe's cultural, social and economic conditions are especially attractive in terms of the development process currently under way in Latin America and the Caribbean.

This chapter offers, first, a very general overview of aggregate European FDI flows into Latin America and the Caribbean and, second, an analysis of some specific sectors in which European companies have great potential to contribute to sustainable development in the region through quality FDI.

1. European FDI flows into Latin America and the Caribbean

In 2016, 53% of the FDI entering the region was registered as coming from European countries. In general, European investors are more important in South America, while United States investors predominate in Mexico, Central America and the Caribbean. European-registered FDI represents 71% of total FDI entering Brazil, 32% of FDI in Mexico and just 12% of flows into Central America and the Dominican Republic.

Nevertheless, FDI data by country of origin must be treated with caution, because of the practice of channelling investments through third countries, which are those ultimately registered by the authorities in the destination country. This is particularly evident in the case of the Netherlands, which accounts for 12% of investment in the region by European countries in 2016 —more than any other European country. Nevertheless, the data show how important Europe is as a source of FDI for the region, especially in South America. For a more detailed analysis, it is necessary to examine investment announcements, as well as mergers and acquisitions.

In the past few years, European transnationals have headed the announcements of new investments in Latin America and the Caribbean (see figure IV.2). Between 2005 and 2017, 39% of the total value of new projects corresponded to firms from the European Union, leaving firms from North America in second place (with 32% of the total). Third, with 16%, were transnational firms from Asia-Pacific, together with those from China and Hong Kong (Special Administrative Region (SAR) of China), and fourth were trans-Latins,[2] which announced cross-border investment representing 9%, by value, of all new projects.

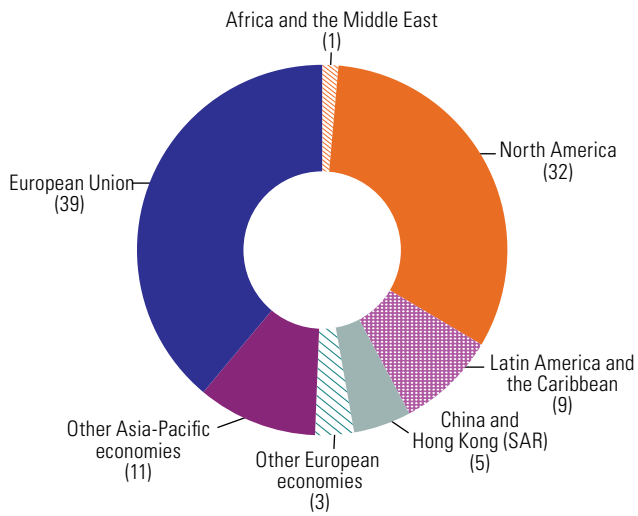


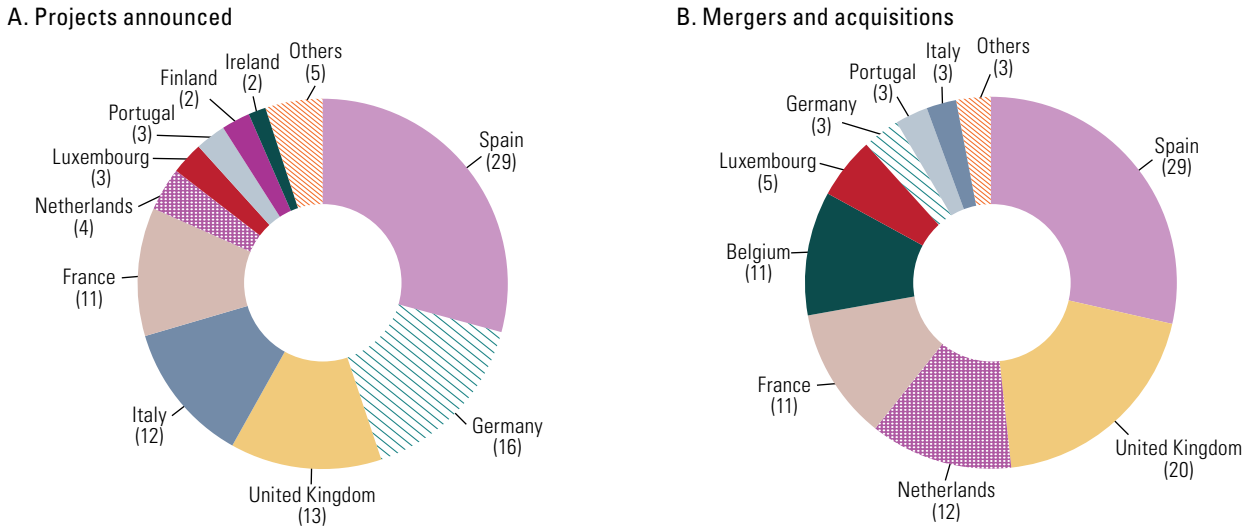
Figure IV.2
Latin America and the Caribbean: distribution of FDI announcements by region of origin, 2005-2017
(Percentages of total amount)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] https://www.fdimarkets.com.

[2] Trans-Latins are Latin American or Caribbean firms that have invested directly abroad but within the region.

European FDI is largely dominated by Spain, which represented 29% of European investment in new projects in the region and 29% of European mergers and acquisitions, by value, in the period. Germany (16%), the United Kingdom (13%), Italy (12%) and France (11%) are the next largest investors in new projects in the region. As well as Spanish firms, the main firms investing in the region through mergers and acquisitions are from the United Kingdom (20%), the Netherlands (12%), France (11%) and Belgium (11%) (see figure IV.3). The relatively large share accounted for by the Netherlands is attributable to its role as a financial platform, owing to its tax advantages, and the weight of Belgium is chiefly the result of its large mergers and acquisitions in the brewing sector.

Figure IV.3
Latin America and the Caribbean: distribution of European FDI amounts and mergers and acquisitions announced, by country of origin, 2005-2017
(Percentages)



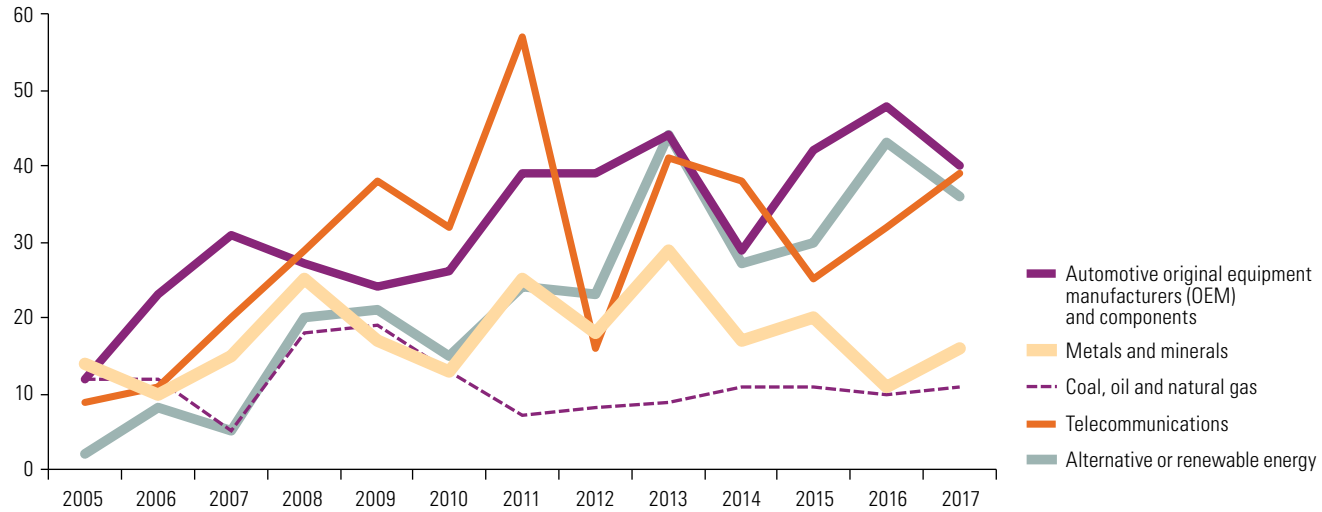
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] https://www.fdimarkets.com/, and data from Bloomberg.

Between 2005 and 2017 the sectors attracting the largest European investments in Latin America and the Caribbean were renewable energies, telecommunications, mining, the automotive sector and oil.

The sectoral composition of investment in Latin America changed notably in this period, however, and this also affected new investments by European Union firms in the region.

In the case of European investments in Latin America, the analysis is based on investment projects announced. The extractive industries, which represented 43% of the amount announced in 2005, fell to 11% in 2016 and 14% in 2017, while projects in telecommunications and renewable energies increased significantly. Figure IV.4 shows the number of European projects announced in Latin America and the Caribbean by sector between 2005 and 2017. Projects announced in telecommunications, renewable energies and the automotive sector rose, while the number of projects in the extractive industries has stood still in the past few years.

Figure IV.4
Latin America and the Caribbean: number of projects announced by European investors by industry, 2005-2017



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] https://www.fdimarkets.com/.

Renewable energies increased their share in the portfolio of European investment in the region: from 3% in 2005 to 18% in 2017 (peaking at 34% in 2016). The share of telecommunications rose from 7% to 16% over the same period, with the largest proportion going to Brazil (36%), followed by Mexico (14%), Argentina (13%) and Chile (7%). These investment announcements were made mainly by firms from Spain (51%), Italy (16%), the United Kingdom (10%) and France (9%).

The motor vehicle sector remains attractive for European firms, with an average share of 11% of project announcements, by value, between 2005 and 2017. The leadership corresponded to German carmakers, whose projects represented 54% of the total value announced for the sector in the region, followed by firms from Italy (19%) and France (13%).

With regard to mergers and acquisitions involving European firms in Latin America and the Caribbean, the largest transactions have taken place in two sectors: telecommunications and the brewing industry. Of the six largest acquisitions in the past few years, three have involved Telefónica and the other three brewing companies (see table IV.1). Energy and finance have also seen major mergers and acquisitions.

Table IV.1
Latin America: largest business acquisitions by European firms, 2005-2016

Year	Firm	Country of origin	Assets acquired	Country where assets located	Country of the seller	Sector	Amount *(billions of dollars)*
2013	AB InBev	Belgium	Grupo Modelo S.A.B. (65%)	Mexico	Mexico	Beverages/liquors	17.231
2015	Telefónica S.A.	Spain	Global Village Telecom	Brazil	France	Telecommunications	10.285
2010	Telefónica S.A.	Spain	Brazilcel N.V.	Brazil	Portugal	Telecommunications	9.557
2005	SABMiller PLC	United Kingdom	Bavaria S.A.	Colombia	Colombia	Beverages/liquors	7.806
2010	Heineken	Netherlands	FEMSA-Brewing operation	Mexico	Mexico	Beverages/liquors	7.439
2005	Telefónica S.A.	Spain	Bell South's Latin America Wireless Operations	Argentina	United States	Telecommunications	5.850
2014	Gas Natural Fenosa	Spain	Compañía General de Electricidad (CGE) (96,5%)	Chile	Chile	Energy	5.606
2010	Vivendi S.A.	France	Global Village Telecom	Brazil	Brazil	Telecommunications	4.186
2014	Royal Dutch Shell	Netherlands/ United Kingdom	Repsol liquified natural gas (LNG) portfolio	Peru, Trinidad and Tobago, and Spain	Spain	Oil and gas	4.100
2008	Anglo American PLC	United Kingdom	Anglo Ferrous Brazil (IronX)	Brazil	Brazil	Steel	3.493
2014	Banco Santander S.A.	Spain	Banco Santander Brasil (14%)	Brazil	Brazil	Finance	3.199
2015	Cable & Wireless	United Kingdom	Columbus International	Caribbean and Central American countries	Barbados	Telecommunications	3.025
2010	Banco Santander S.A.	Spain	Grupo Financiero Santander Mexico S.A.B. de C.V.	Mexico	United States	Finance	2.500
2015	British American Tobacco PLC	United Kingdom	Souza Cruz S.A.	Brazil	Brazil	Manufacturing	2.422
2011	A.P. Møller-Mærsk	Denmark	SK do Brazil	Brazil	Republic of Korea	Oil and gas	2.400
2011	Iberdrola S.A.	Spain	Elektro Eletricidade e Serviços	Brazil	United Kingdom	Energy	2.393

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Bloomberg and specialized press.

2. The quality of European investment

Investment by European Union countries may offer Latin America an opportunity to move towards high-quality investment.

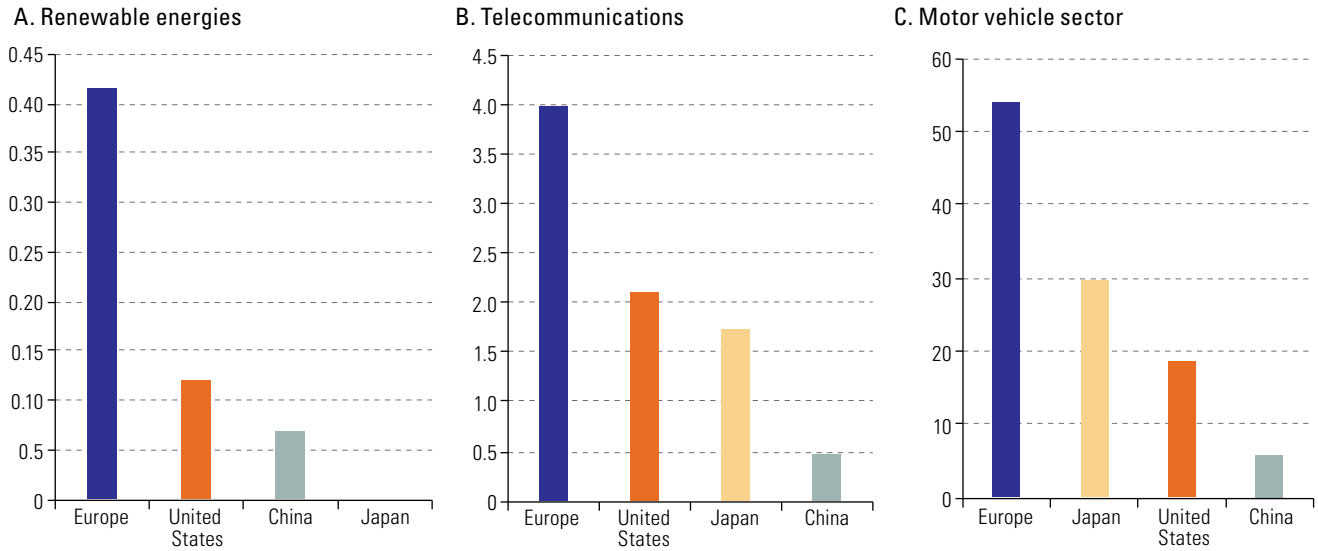
The region's production structure is uneven and poorly diversified, with large productivity gaps between sectors and agents, as well as vis-à-vis the international frontier. In particular, Latin America is dominated by low-productivity small and medium-sized enterprises (SMEs) which are poorly linked to other firms within the production apparatus. As a result, Latin American and Caribbean firms face major challenges in increasing their low levels of productivity, improving wages, joining global value chains and upgrading their human resource skills.

In this context, foreign investment, beyond its positive effects on the balance of payments, can contribute to diversifying the production structure, improving local capacities, creating quality employment and generating linkages with local and regional suppliers. FDI can also be a key factor for technology transfer and for integrating new management systems and business models to boost competitiveness and productivity.

Today, the region must make progress in creating a less uneven production and business base, capable of generating more value added, if it is to progress in the transition towards a new development paradigm based on environmental sustainability and inclusion. In this regard, FDI can also make a contribution towards achieving the Sustainable Development Goals, especially Goal 7, "Ensure access to affordable, reliable, sustainable and modern energy for all", Goal 8, "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" and Goal 21, "Ensure sustainable consumption and production patterns".

Most European Union FDI in Latin America has been concentrated in three sectors: renewable energies, telecommunications and motor vehicles. In these sectors, the large European firms, through spending on research and development (R&D) are world leaders in efforts to develop new technologies and innovation processes, as may be observed in figure IV.5.

Figure IV.5
Investment in R&D by the 2,500 largest firms in the world in renewable energies, telecommunications and the automotive sector, by country and region, 2016-2017
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of European Commission, *The 2017 EU Industrial R&D Investment Scoreboard*, Luxembourg, 2017.

These sectors will play a critical role in building new knowledge associated with the fourth industrial revolution and the disruptive changes that the spread of the digital economy is increasingly introducing in the world's production, business and consumption models.

The transition towards renewable energies is one of the key parts of building the new development model proposed by the Sustainable Development Goals, while also contributing to job creation, helping to spread new technologies and facilitating the environmental big push proposed by the Economic Commission for Latin America and the Caribbean (ECLAC) (ECLAC, 2016).

Investments in telecommunications broaden and strengthen the related infrastructure, which is increasingly necessary in the region to meet the growing demand for digital services which, for firms, are essential to progress towards the digital transformation of the economy and business models.

The automotive sector, with its ongoing rapid transformation, has become a catalyst and driver of major technological and production changes associated with the fourth industrial revolution and the dissemination of the digital economy (ECLAC, 2017). It also continues to be an industry with enormous potential to generate networks of suppliers and processes of linkaging.

The countries of the region should take advantage of the strong links between investments in these sectors and technological change (be it in generating or facilitating the change), energy efficiency and better-quality employment creation to shift their production structures towards a growth path that is compatible with the principles set forth in the Sustainable Development Goals.

B. Renewable energies: green technologies and energy transition

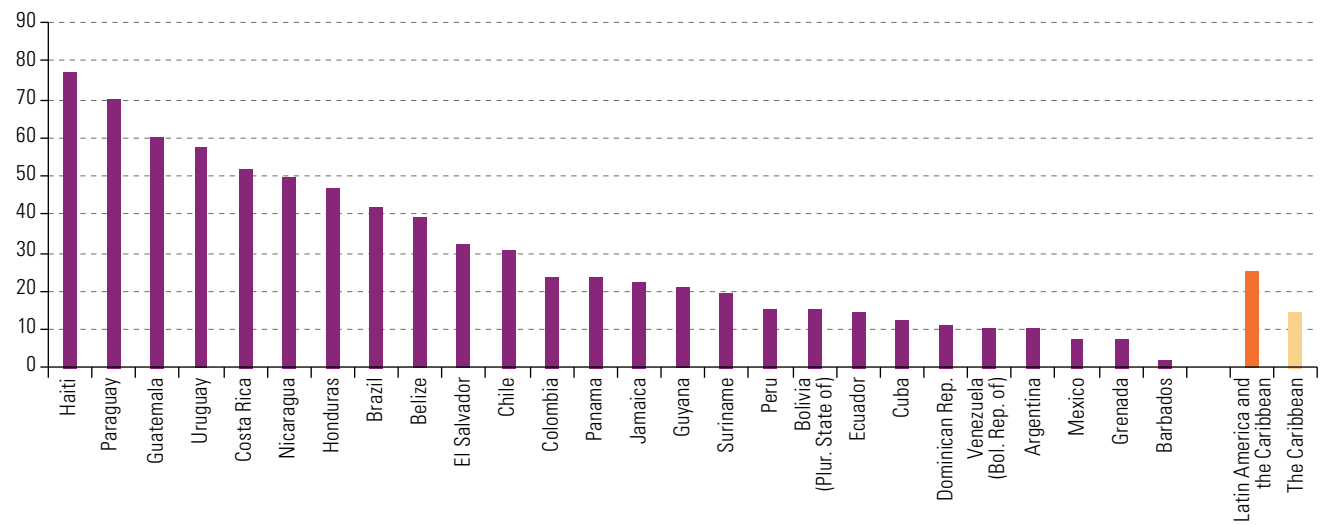
1. The energy transition: an opportunity for Latin America and the Caribbean

The Paris Agreement, adopted in December 2015, is the main framework for policies to combat climate change, in which the countries must begin or expedite their energy transition to achieve a low-carbon economy. In Latin America and the Caribbean, the energy sector is the largest emitter of greenhouse gases, with 46% of total emissions, including the consumption of fossil fuels for transport and for electricity and heating (WRI, 2014).

According to the *Renewables 2017 Global Status Report* of the Renewable Energy Policy Network for the 21st Century (REN21), the Latin American and Caribbean countries are well placed to deploy renewable energies (REN21, 2017). The region has excellent sources of renewable energy and could meet the growing demand for energy using only a portion of its capacity.

Twenty-four per cent of the total primary energy supply in Latin America comes from renewable sources, but excluding energy from material that has to be burned (biomass, normally consumed unsustainably) "clean" renewable energy represents only 11% of the total, and of that amount 70% is hydroelectric. The countries that use the largest proportion of energy form renewable sources are those that rely mainly on biomass (Haiti and Guatemala) or hydropower generation (Paraguay, Costa Rica and Uruguay) (see figure IV.6).

Figure IV.6
Latin America and the Caribbean (26 countries): proportion of the energy supply from renewable sources by country, 2015
(Percentages)

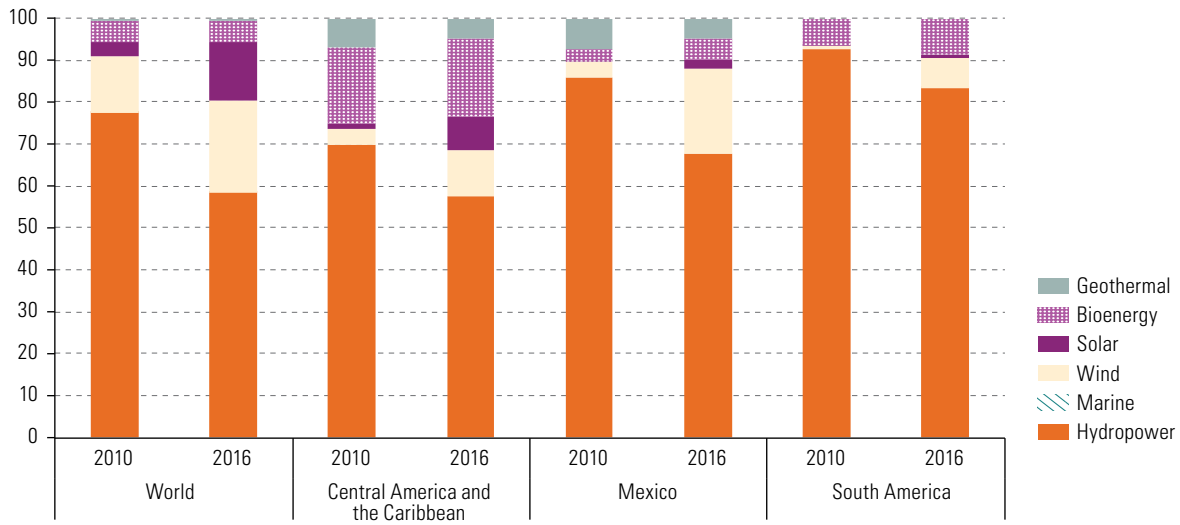


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of CEPALSTAT.

In terms of electricity production specifically, renewable energies represent a large share in the countries of the region. In 2016, 55% of electric power generation came from renewable sources and the other 45% from fossil and nuclear fuels. In 2015, Brazil was third in the world in total electric power generation from renewable sources, after China and the United States, while Costa Rica generated 99% of its electricity from renewable sources and Uruguay, 92.8%.

Hydroelectric generation dominates electric power generation from renewable sources in the region, and in the past three years this trend has sharpened, as new small and medium-sized plants have come on stream, mainly in Brazil, which was second in the world in the installation of new hydropower capacity in 2016 (see figure IV.7). This high dependence on hydropower in certain countries could be problematic in a context of climate change and higher probability of drought. In the past few years, non-conventional renewable energies, mainly wind and solar power, have gained ground in world and regional installed capacity and in 2016 represented 3.4% and 0.3%, respectively, of total electric power generation in the region;[3] thanks to the region's natural endowments, these sources have great potential for development. According to Bloomberg New Energy Finance, the Latin American clean energy market is now one of the world's most friendly markets for international capital (Margolis, 2017). In 2017, four Latin American countries —Brazil, Mexico, Chile and Uruguay— were among the top 10 most attractive countries for clean energy investments.[4]

Figure IV.7
Selected regions: installed capacity for electric power generation from renewable sources, by type of technology, 2010 and 2016
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Renewable Energy Agency (IRENA), *Renewable energy market analysis: Latin America,* Abu Dhabi, 2016 [online] http://www.irena.org/-/media/Files/IRENA/Agency/Publication/2016/IRENA_Market_Analysis_Latin_America_2016.pdf.

3 See Latin American Energy Organization (OLADE), Energy Information System of Latin America and the Caribbean (SIELAC) [online] http://sielac.olade.org/.
4 See Bloomberg New Energy Finance, "Climatescope 2017" [online] http://global-climatescope.org/en/results/.

Wind power has seen a major boom. In 2015, Brazil was fourth in the world in the installation of new wind power capacity (REN21, 2016) and fifth in terms of total installed capacity. In 2016, Brazil continued to lead the region in the installment of new wind capacity and ranked among the global top 10, despite the ongoing economic recession and weak electricity demand growth (REN21, 2017). Almost 60% of the region's installed wind power capacity is in Brazil (Viscidi and Yépez, 2018) and in 2016 the country met 5.7% of its electricity demand from that source (REN21, 2017). Other countries in the region to add capacity in 2016 included Chile (0.5 gigawatts (GW)), which had a record year; Mexico (0.5 GW), which held its first auction in 2016; Uruguay (0.4 GW), and Peru (0.1 GW). Both Chile and Uruguay passed the 1 GW mark for total capacity. Wind energy has also shown steady growth in the past few years in Costa Rica, Panama, Nicaragua and Honduras. In Uruguay, wind power supplied 22.8% of electricity consumption in 2016 and in Costa Rica over 10% (REN21, 2017).

Solar power is gradually beginning to appear in the renewables mix, especially in Chile and in Central America and the Caribbean. Chile has over half the region's installed solar power capacity and in Central America solar power has been gaining considerable traction in the past two years, especially in Honduras, where it covered 9.8% of demand in 2016. Lastly, Mexico began to make progress in solar power generation very recently.

Chile, Brazil, Mexico and, recently, Argentina have changed their regulations to encourage alternative energies without having to offer subsidies. Latin America and the Caribbean is at the vanguard in the use of tenders and auctions to develop renewable power generation projects. In Chile and Mexico, wind power tenders have generated record numbers of bids and low electricity prices. In the solar sector, prices obtained were below US$ 0.03 per kilowatt hour (kWh). The reform in Mexico extends to the entire energy sector (see box IV.1).

Box IV.1
The energy reform in Mexico

The energy reform in Mexico was passed in 2014. The Mexican renewable energy market is governed by the General Act on Climate Change, published on 2 June 2012, but has improved as a result of energy reforms adopted in August 2014. In fact, the reform affected not only the oil and gas market, but also liberalized electric power generation. Previously, most of the country's electricity was generated by the Federal Electricity Commission (CFE), a State utility. The reform package created an independent transmission grid operator, the National Electricity Control Centre (CENACE), which controls a new market and allows clients to buy energy directly from generators. The establishment of CENACE created a market of independent power producers (IPPs) for the first time in Mexico. According to the International Energy Agency (IEA) scenarios to 2040, the reform will boost the production of oil, increase the proportion of renewable energy sources in the energy sectors, increase energy efficiency and reduce CO_2 emissions growth.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Energy Agency (IEA), *Energy policies beyond IEA countries: Mexico 2017*, Paris, 2017 [online] https://www.iea.org/publications/freepublications/publication/EnergyPoliciesBeyondIEACountriesMexico2017.pdf.

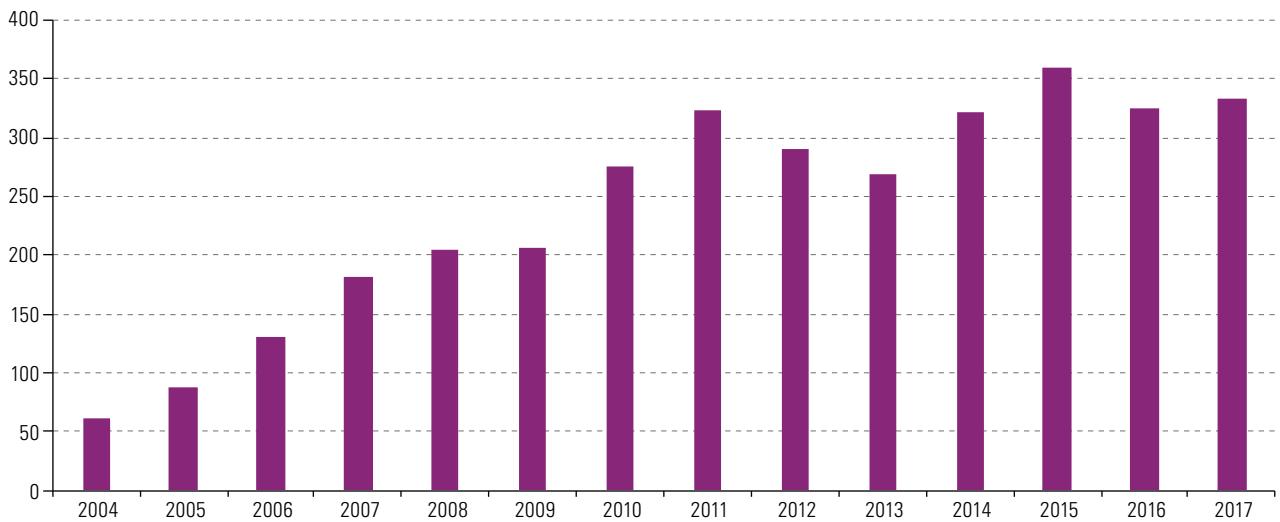
Note: Mexico has established by law the aim of increasing electricity generation from clean renewable sources, including nuclear energy, to 35% by 2024 and 50% by 2050. It has also set an additional target of reducing greenhouse gas emissions by 30% by the end of the decade.

2. Global and European investments: flows and trends

Although the cost of generating electricity from wind and solar energy is falling precipitously, the sector is intensive in capital and new technology. For that reason, FDI is essential for its development and for the region's energy transition. In fact, in Latin America the renewable energy sector was the largest recipient of new FDI projects in 2016 (with 18% of the total amounts announced), and the second largest in 2017, after telecommunications.[5]

The trend in Latin America follows the global trend. Data from Bloomberg New Energy Finance show that US$ 333.5 billion was invested globally (including both foreign and national figures) in non-conventional renewable energies in 2017, 3% more than in 2016 (BNEF, 2018) (see figure IV.8). In 2016, despite record installation of new capacity, investment fell because of the considerable drop in costs. In 2017, investment rose even though costs continued to fall heavily. Investment rose strongly in all the region's main markets: by 10% in Brazil, to US$ 6.2 billion, and by 5% in Chile, to US$ 1.5 billion. Investment increased sevenfold in Argentina, to reach US$ 1.8 billion, and fourfold in Mexico, to US$ 6.2 billion, driven by large-scale financing for wind and solar projects.

Figure IV.8
Global investments in clean energies, 2004-2017[a]
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Bloomberg New Energy Finance (BNEF), "Runaway 53GW solar boom in China pushed global clean energy investment ahead in 2017", 16 January 2018 [online] https://about.bnef.com/blog/runaway-53gw-solar-boom-in-china-pushed-global-clean-energy-investment-ahead-in-2017/.

[a] The expression "clean energies" refers to renewable energies, except large-scale hydropower, but including smart energy technologies, such as those targeting energy efficiency or electric vehicles.

[5] See Financial Times, fDiMarkets [online database] https://www.fdimarkets.com/.

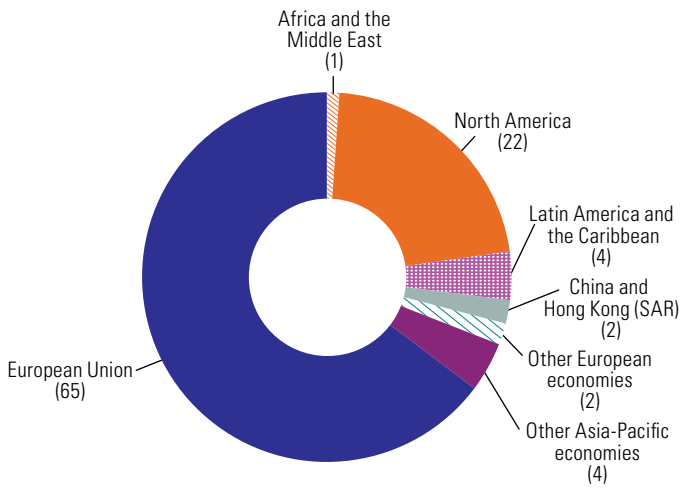
In 2017, solar energy was the leading global technology, attracting investments of US$ 160.8 billion, or 48% of total global investment in non-conventional renewable energies, but that percentage was much lower, albeit rising, in Latin America and the Caribbean. Brazil, for example, saw a heavy investment in the wind sector and Mexico in geothermal energy. The Plurinational State of Bolivia and Honduras have attracted relatively small investments, but they are nevertheless ranked first and third, respectively, in terms of investment in renewable fuels per unit of GDP.

Chile accounts for most of the region's solar investments, with the largest being made in the north of the country. In addition, although China dominates the market for the production of photovoltaic panels, modules are now being produced in a new facility established in Brazil in 2016, by the firm Canadian Solar.

(a) Investments by European firms

Investment in the non-conventional renewable energy sector in the region is dominated by European firms. Two thirds of investment in electricity generation from renewables was made by European companies, mainly in wind and solar projects (see figure IV.9).

Figure IV.9
Latin America and the Caribbean: distribution of FDI announcements in renewable energies, by region of origin, 2005-2017
(Percentages of total amount)



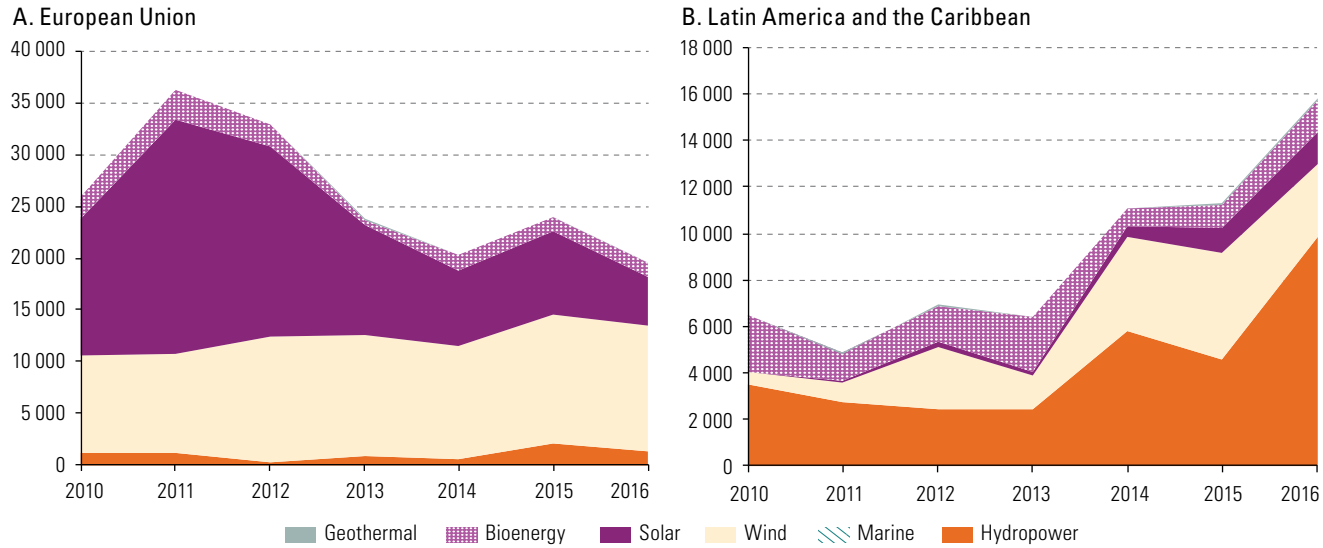
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] https://www.fdimarkets.com/.

The fact that European firms had already been developing capacities in their home countries for over a decade when the investment opportunities arose in this sector in the region enabled them to seize the opportunities effectively and led the industry to develop at a rate that would not have been feasible without this transfer of knowledge.

At the same time, the opportunity to invest in Latin America, first in wind power and later in solar energy, offered European firms the chance they needed to expand at a time when policies on support for the sector abruptly changed in the European Union and led to a drastic fall in investment in new capacity (see figure IV.10).

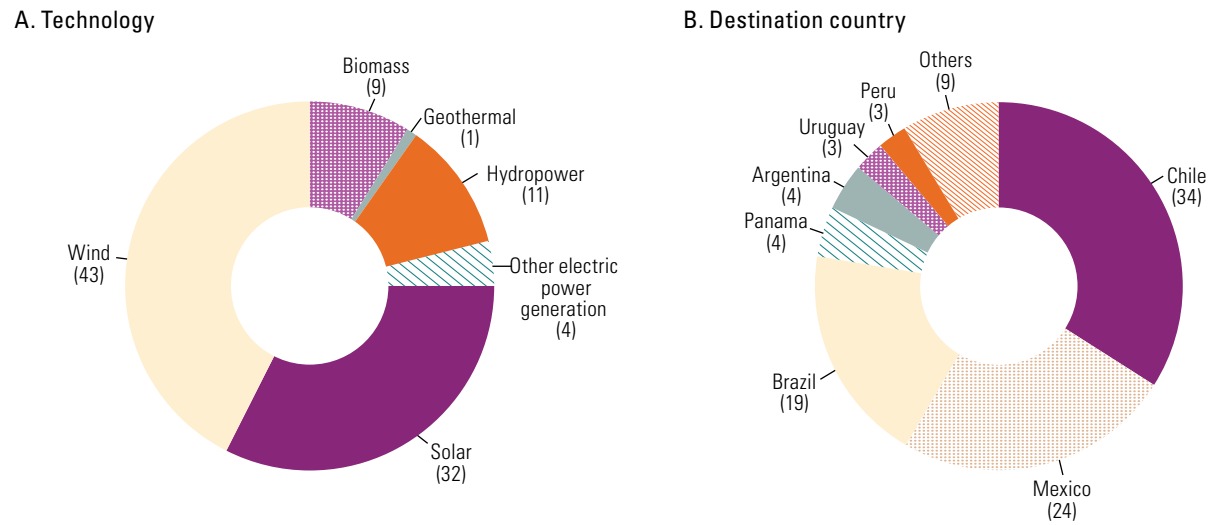
Between 2005 and 2017, announcements of European investments in renewable energies in Latin America were concentrated in non-conventional sources, mainly in solar and wind (see figure IV.11). Hydropower generation represented only 11% of FDI in this period, and half of the total amount came from the Italian firm Enel and its Spanish subsidiary Endesa.

Figure IV.10
European Union and Latin America and the Caribbean: new installed capacity for electricity generation from renewable sources, by technology, 2010-2016
(Megawatts)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Renewable Energy Agency (IRENA), *Renewable energy market analysis: Latin America*, Abu Dhabi, 2016 [online] http://www.irena.org/-/media/Files/IRENA/Agency/Publication/2016/IRENA_Market_Analysis_Latin_America_2016.pdf.

Figure IV.11
Latin America and the Caribbean: distribution of European investment projects announced in electricity generation from renewable sources by amount, by technology and destination country, 2005-2017
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] https://www.fdimarkets.com/.

European investment in solar energy is dominated by Spanish firms, which represent over half of projects announced in the region. Abengoa, with its investments in solar thermal energy in Chile, represents 20% of European investments in solar energy. In this type of energy, the leading destination countries are Chile (45%), Mexico (33%) and Brazil (10%).

Many European Union firms announced solar energy projects in Chile and Mexico between 2010 and 2017, including major firms such as Acciona, Total, Engie and Enel, and medium-sized German and Spanish firms. The largest project was the solar energy project of the Spanish firm Abengoa in the north of Chile, which was halted in 2015, when the firm defaulted. The work was resumed in late 2016, with Abengoa as a contractor, and the plant is expected to come on stream in 2019 (*Electricidad,* 2017).

In 2017 the Italian firm Enel began building the largest photovoltaic solar energy plant in Latin America, in the north of Mexico. Enel will invest US$ 650 million in building the Villanueva project in the State of Coahuila de Zaragoza. It will be divided into two separate sections, with capacities of 427 MW and 327 MW, respectively. Together, the two plants, which are expected to come on stream in the second half of 2018, will generate around 1,700 Gigawatt hours (GWh) per year, enough to power 1.3 million households (Mahapatra, 2017). In addition, the Spanish firm Huntec Technology Albacete announced that it will build two new photovoltaic solar plants in Mexico, with an investment estimated at US$ 135 million (ProMéxico, 2018).

In wind energy, the largest investors, according to project announcements between 2010 and 2017, were Enel (13%), Iberdrola (10%), Mainstream Renewable Power (9%) and Acciona (8%). The main destination countries were Chile (31%), Mexico (30%), Brazil (12%), Argentina (9%) and Panama (6%). In 2017, Enel announced an investment of US$ 700 million in four new wind plants in Mexico, which will come on stream in the first half of 2020 (ProMéxico, 2018).

3. Impact of European polices on the investment strategies of European firms in Latin America and the Caribbean

The European Union has been a world leader in policies on climate change mitigation, including incentives for renewable energies, whose use increased from about 8.5% of total energy in 2004 to 17% in 2016.[6] Although some of these policies saw cuts in the fiscal crisis of the last decade, the objectives remain.

In 2009, the European Parliament and the European Council adopted Directive 2009/28/CE, modified in 2013, which established the aim of achieving a share of 20% from renewable sources in gross final energy consumption of the European Union by 2020, with specific objectives for each member State. In addition, it required all member States to obtain 10% of transportation fuel from renewable sources by 2020, and set criteria for biofuel sustainability.

The European Union also has a structured approach to research and innovation on energy, in the framework of the Strategic Energy Technology Plan (SET Plan). By identifying strategic priorities and specific actions, backed by collaboration between research institutes, the academic sector and industry, public research funds have been leveraged to obtain significant advances. Today, European firms hold 40% of all patents for renewable energy technologies and are leaders in key sectors:

- In wind power, in which the European Union is an important player, with four European firms, including the global leader, among the world's 10 largest manufacturers of wind turbines.
- In marine wind power, with 43% of all wind turbines in the world produced by some of the largest European manufacturers.

6 Data from Eurostat.

- In marine power, with new projects being deployed in Europe with a capacity of 460 MW in the next three years.
- In concentrated solar power, with firms from the European Union involved in most of the projects developed so far in the world, and an ambitious aim of reducing the industry's costs in those countries by 2020.

In 2015, the European Union launched a new plan to boost research and innovation and speed cost reduction. The European Commission proposed 10 research and innovation actions aimed at accelerating the transformation of the energy system and creating jobs and growth, ensuring the European Union's leadership in the development and deployment of low-carbon energy technologies (European Commission, 2015).

The European Union's support policy for the development of alternative energy technologies has a large impact on global markets and on Latin America, where the main investors are European firms. In fact, this support helps improve investment in R&D, which is indispensable for the development of firms in these sectors and for their global competitiveness. For example, the Basque firm Arrecife Systems has obtained a 50,000-euro (€) subsidy from the European Union to help develop its wave energy technology, through the European Union framework programme for research and innovation (Horizon 2020). In 2015, the European Investment Bank (EIB) extended Abengoa a loan of € 125 million to support its research, development and innovation (RD&I) activities.[7]

In terms of public policy, the European experience has also served as a lesson for the countries of the region, which have been able to avoid committing the main errors of the European policies, principally the establishment of feed-in tariffs for renewable technologies which helped boost the industry's rapid development, but carried a high fiscal cost and later had to be reviewed.

Finally, the new renewable energies have opened up a field for bilateral operation for development between Europe and Latin America, which could be very important for some countries. The percentage of official development assistance devoted to energy, which had fallen by half since the 1980s, rose notably between 2003 and 2008, by 16% annually, mainly owing to the adoption of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, which generated more assistance for renewable energy projects.[8] The largest donors in this area were Japan and the United States, followed by Germany and Spain, which have a good number of firms specialized in the segment. The German cooperation agency, for example, devoted 30% of its funds in 2010 (US$ 1.333 billion) to energy, in which renewable energies played a prominent role.[9] Another major donor for many countries is the European Investment Bank, whose criteria for loan approvals in Latin American include the project's contribution to environmental sustainability and the participation of European firms through FDI (ECLAC, 2012).

7 See European Investment Bank (EIB), "EIB signs first EFSI loan in Spain in support of Abengoa's RDI", 7 July 2015 [online] http://www.eib.org/infocentre/press/releases/all/2015/2015-153-el-bei-firma-el-primer-prestamo-bajo-el-fondo-europeo-de-inversiones-estrategicas-en-espana-en-apoyo-de-las-actividades-de-idi-de-abengoa.htm.

8 Data provided by the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD).

9 Refers to financial cooperation funding from the bank KfW, which is accounted for separately from technical cooperation.

C. Telecommunications: a key sector for the digital economy

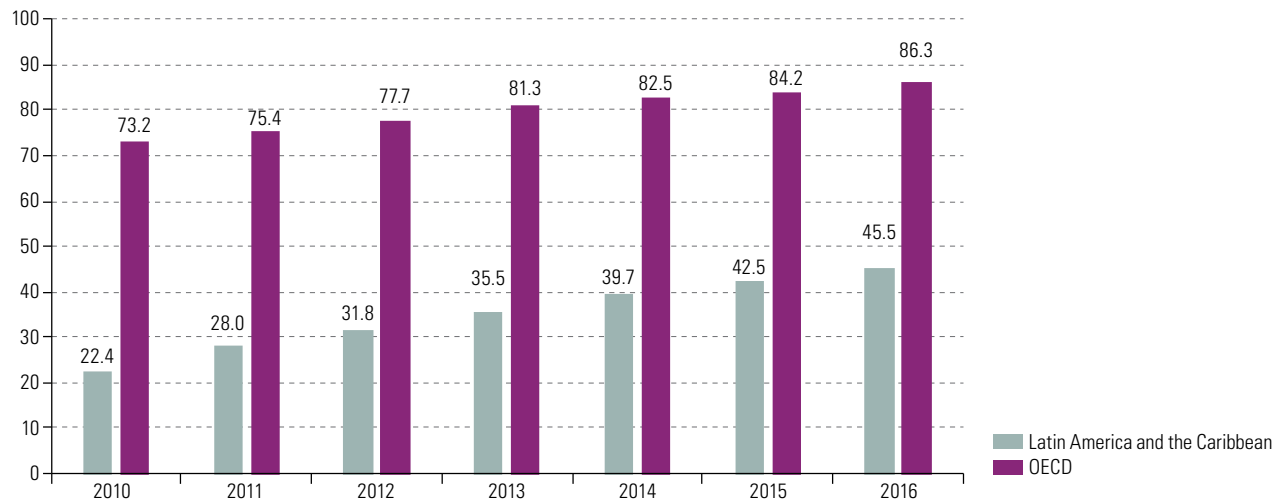
1. A rapidly changing technological sector

The development of the telecommunications industry is critical for the region's productive structure transformation process, because the digital economy, with its implications for productivity and innovation, depends on connectivity.

In Latin America and the Caribbean, the percentage of households connected to the Internet doubled between 2010 and 2016, but over half still have no access (see figure IV.12). The regional figures mask major differences between and within countries, however, as well as between social classes and rural and urban areas. The countries where investment per capita is particularly high are also those where Internet penetration in households is higher (see figure IV.13). In fact, Costa Rica (with US$ 132 invested per capita), Uruguay (US$ 120 per capita), and Chile (US$ 113 per capita), have relatively high proportions of household Internet connections, at 60.3%, 59.7% and 65.1%, respectively (see table IV.2).

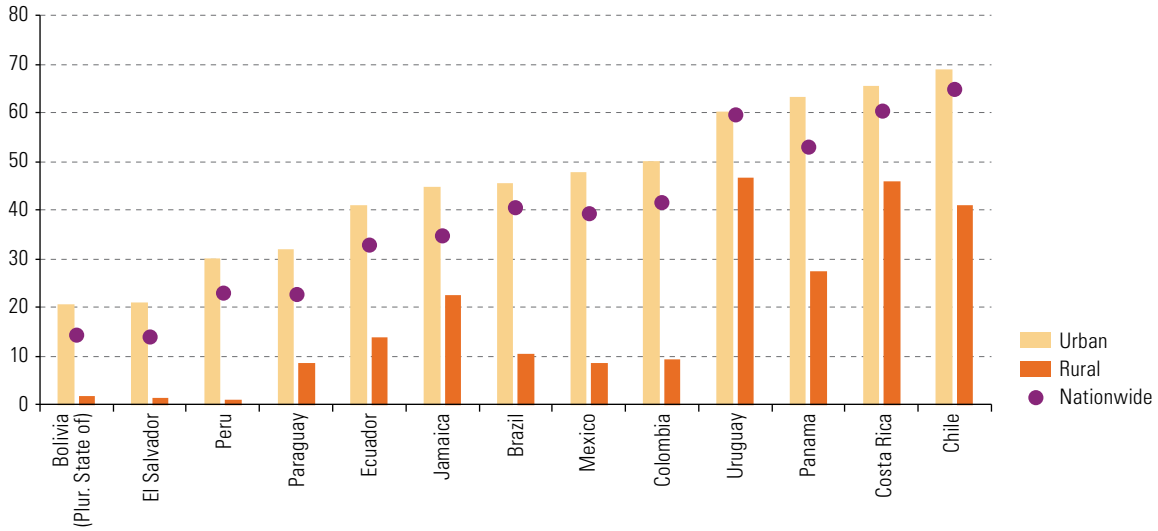
In 2014, the telecommunications industry in Latin America and the Caribbean produced U$ 147.8 billion in sales, US$ 68.0 billion in value added and 600,000 direct jobs (Katz, 2017). The sector is worth twice as much as the oil and gas sector, and more than twice as much as electricity distribution. Of its value added, 43% is invested in the maintenance of existing infrastructure and rolling out new networks. In 2014, according to research by the Latin American Centre for Telecommunications Studies (Katz, Flores-Roux and Callorda, 2017), investment reached US$ 29.3 billion, including the acquisition of equipment and construction (estimated at US$ 26.6 billion) and licences for spectrum use and permits to build infrastructure (US$ 2.699 billion).

Figure IV.12
Latin America and the Caribbean and OECD: households with Internet access, 2016
(Percentages of all households)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), Regional Broadband Observatory (ORBA), on the basis of International Telecommunication Union (ITU), World Telecommunication/ICT Indicators Database, 2017.
Note: The figures refer to the regional average for households with Internet. The data for OECD do not include Chile or Mexico.

Figure IV.13
Latin America and the Caribbean (13 countries): households with Internet access, by geographical area, around 2015
(Percentages of all households in each area)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), Regional Broadband Observatory (ORBA), on the basis of Household Survey Data Bank (BADEHOG) and International Telecommunication Union (ITU), World Telecommunication/ICT Indicators Database, 2017, for Jamaica, Mexico and Panama.

Table IV.2
Latin America (selected countries): average investment in telecommunications, 2006-2014
(Percentages of GDP and dollars per capita)

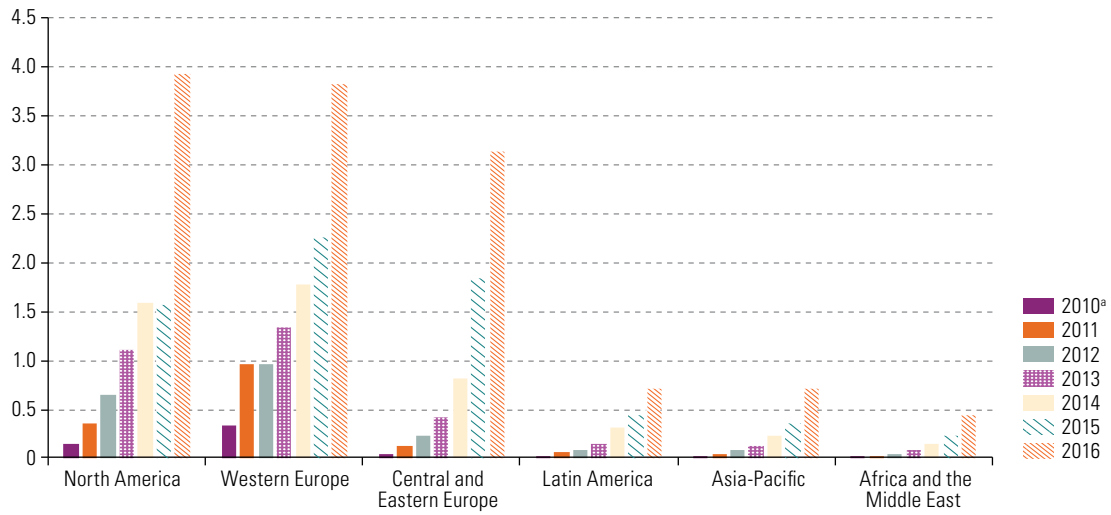
Country	2006-2012		2010-2012		2012-2014	
	Percentage of GDP	Investment per capita (dollars)	Percentage of GDP	Investment per capita (dollars)	Percentage of GDP	Investment per capita (dollars)
Argentina	0.38	40.88	0.39	51.94	0.39	55.39
Bolivia (Plurinational State of)	1.12	20.34	1.20	26.69	1.15	32.37
Brazil	0.51	48.89	0.49	59.54	0.53	58.80
Chile	0.89	105.96	0.93	131.15	0.75	112.66
Colombia	0.57	33.60	0.53	38.26	0.56	43.18
Costa Rica	1.37	100.86	1.75	155.76	1.27	132.19
Ecuador	0.57	25.48	0.37	18.88	0.53	31.99
Mexico	0.42	39.78	0.52	51.42	0.53	54.91
Paraguay	0.67	19.34	0.39	13.56	0.68	28.01
Peru	0.60	27.67	0.55	31.50	0.61	38.64
Uruguay	1.11	114.07	1.41	190.56	0.75	119.88
Venezuela (Bolivarian Republic of)	0.56	50.88	0.48	47.95	0.63	48.35
Total	0.52	44.91	0.53	54.59	0.55	55.59

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of R. Katz, E. Flores-Roux and F. Callorda, "Distribución de retornos y beneficios generados por el sector de las telecomunicaciones en América Latina", Centro de Estudios de Telecomunicaciones de América Latina (CET.LA)/Development Bank of Latin America (CAF), October 2017.

Between 2000 and 2010, telecommunications firms faced sudden technological changes, highly uneven demand and new competition from firms offering similar services without providing the infrastructure (Meffert and Mohr, 2017). While telecommunications infrastructure forms the base of the digital economy and society, digitization itself is completely changing the business model in the telecommunications sector, with the growing importance of mobile virtual network operators (MVNOs) and providers of Internet-based services (also known as over-the-top (OTT) services).

Telecommunications will only grow in importance, as firms from all sectors continue to require better access to mobile and cloud services. In Latin America, between 2010 and 2016, mobile data traffic multiplied by 30 and annual flows are projected to reach 44 billion gigabytes in 2020, 10 times more than in 2013 (WEF, 2016). The region still lags far behind North America and Europe, although its level is similar to that of Asia-Pacific, with an average of 0.7 gigabytes per month per capita in 2016, less than a fifth of the traffic per capita in North America (see figure IV.14).

Figure IV.14
Monthly mobile data traffic per capita, by region, 2010-2016
(Monthly gigabytes per capita)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), Regional Broadband Observatory (ORBA), on the basis of data from Cisco Systems.
[a] The value shown for Asia-Pacific for 2010 does not include data for Japan.

In view of these considerations, with a view to the development of the region, investment in infrastructure by telecommunications operators is crucial to offer users greater speed and bandwidth and cater to the exponential growth of voice and data traffic generated by OTT service providers, the Internet of Things or autonomous vehicles.

This growth in demand drives operators' investments. They are also pressured by governments, aware of the importance of connectivity for economic growth. However, despite rising demand, operators perceive that the returns on their investments will depend on how the business model evolves in the next few years. In particular, operators fear that MVNOs and OTT service providers will capture a larger share of the revenues and are accordingly seeking new strategies. For example, Telefónica launched Movistar Series as a step towards becoming itself a provider of OTT services, and not only of connectivity.

2. Global and European investments: flows and trends

Latin America's telecommunications sector is dominated by transnational firms, with the sole —and major— exception of Mexico. For this reason, it is one of the sectors that receives most FDI in almost all the countries. In 2017, the largest foreign investment announced in the region, equivalent to 15% of the total, was in telecommunications, followed by renewable energies. The European Union is the main origin of these investments, with 43% of those announced between 2005 and 2017 (see figure VI.15).

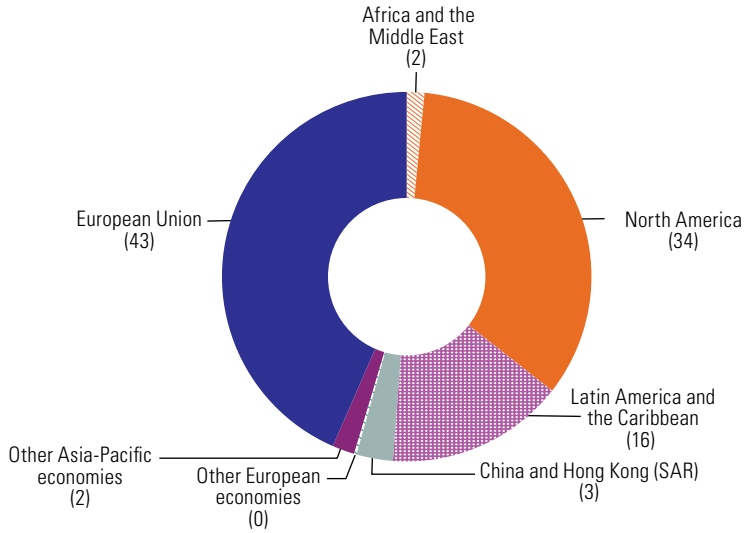


Figure IV.15
Latin America and the Caribbean: distribution of FDI announcements in telecommunications, by region of origin, 2005-2017
(Percentages of total amount)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] https://www.fdimarkets.com/.

In practice, the sector is dominated by two major transnationals which are present in all the region's large markets: Telefónica of Spain and América Móvil of Mexico. The Competitive Intelligence Unit (CIU) noted that in 2016, the two firms possessed over 60% of the Latin American market, where América Móvil operates in 16 countries and Telefónica in 14 (*El Financiero,* 2017). Telefónica represents over 50% of European investment amounts announced in the region, followed by Telecom Italia, which operates in Brazil through TIM Brasil Serviços e Participações and represents 15.9% of European investment, and Millicom International Cellular, with 6.9%, and Orange, with 6.1%.

Most of these projects in the region are in the six largest markets: Brazil, Mexico, Argentina, Chile, Colombia and Peru (see figure IV.16). However, some firms invest in smaller economies: Millicom International Cellular is present in Central America and Paraguay, as well as Colombia.

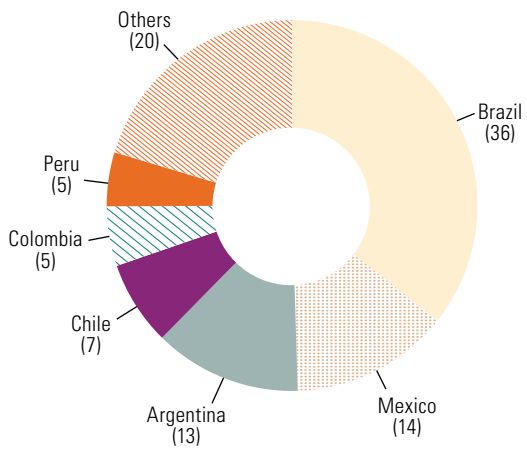


Figure IV.16
Latin America and the Caribbean: distribution of European FDI announcements in telecommunications, by destination countries, 2005-2017
(Percentages of total amount)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] https://www.fdimarkets.com/.

The Spanish firm Telefónica arrived at its current position by means of a long series of acquisitions in Latin America, lasting from 1988 up to the present. Early on, it acquired historical fixed telephony operators in Argentina, Brazil, Chile and Peru, and later in Colombia. With this client platform and infrastructure, Telefónica then began to increase its presence in mobile telephony, by buying assets from its competitors, and gained full control of its subsidiaries through public offerings. Over almost 27 years, Telefónica has devoted over € 121 billion to investments in Latin America, of which 47% went to purchasing assets and the rest to investments in its subsidiaries (*El Cronista,* 2014). Thanks to these massive investments, telecommunications infrastructure in Latin America is, on the whole, much more advanced than other types of infrastructure.

At the same time, the Spanish company's assets in the region helped to protect it from the crisis at home. In 2014, Telefónica's business in Latin America represented 51% of its revenues and 68% of its entire customer base. Brazil alone generates half the company's revenues in Latin America and el 23% of the group's consolidated revenues. The success of its operations in the region also enabled Telefónica to expand later into other European companies (Germany, Italy, the United Kingdom and Czechia).

In November 2017, Telefónica invested € 183 billion in its subsidiary Telefónica Movistar Mexico, to compete with Telcel in 4G technology. It has also signed an agreement with Viacom to make MTV, Paramount, Comedy Central and Nickelodeon available in Latin America through Movistar Play, its OTT platform. Lastly, Telefónica plans to become an Internet service provider in Mexico, where it will compete with Televisa and Telmex, which currently have 22% and 56.2%, respectively, of the market (Portada, 2018).

D. The digital economy

The digital economy encompasses firms whose main business model is the application of digital technologies to provide goods and services. This section leaves out the analysis of telecommunications operators (examined in the previous section) and manufacturers of electronic devices.

This definition includes very diverse companies which, according to the classification of the United Nations Conference on Trade and Development (UNCTAD, 2017) may be divided into:

(i) Internet platforms: digitally born businesses, such as search engines and social networks;

(ii) Digital solutions, such as electronic payment operators and cloud players;

(iii) E-commerce, or online platforms that enable commercial transactions, including the online sale of goods and services; and

(iv) Digital content, producers and distributors of goods and services in digital format, such as music, videogames and data.

Under this definition, digital firms in Latin America are few and generally small, but nevertheless important owing to their capacity to innovate and their role in facilitating the digital economy in general. There is awareness in the region's larger economies of the importance of developing an ecosystem for digital firms to facilitate the transformation of the economy. A number of schemes have been rolled out to support start-ups, of which the most advanced are probably Start-Up Brasil, Startup México and Start-Up Chile.

As in other advanced technology sectors, FDI could play an important role in knowledge transmission. However, the way these firms enter the market has some particularities. First, many of them do not need a physical presence in the countries in

which they operate (Google, Netflix), or any presence they do have is capital-light and thus has little impact on FDI flows. In many cases, digitization eliminates the need for investment in market-seeking, because global markets can be serviced with very little direct presence on the ground.

Digitization also gives many small firms immediate access to international markets (born global businesses). From a policy standpoint, this blurs the distinction between support for the development of local firms and attraction of FDI. In this regard, Start-Up Chile stands out for being explicitly open to foreign entrepreneurs wishing to set up in Chile. Of the 272 firms supported by the programme that achieved market value, 216 were foreign, most of them from the United States and other Latin American countries, but also from Europa and Asia.[10]

In the case of more mature firms, there have been major flows of business mergers and acquisitions, largely aimed at acquiring strategic assets, mainly technology. For this reason, acquisitions are concentrated in developed countries: half of them were in the United States and the United Kingdom. China and India are the only developing countries among those making most acquisitions of technology firms (5% and 3% of the total, respectively) (Gestrin and Staudt, 2018).

Acquisitions have also been made in developing countries, however, sometimes to gain homegrown technology developed there, but more often as a way to capture markets. This has led to many acquisitions in this sector in Latin America.

Data from Bloomberg show that between 2005 and 2017 there were 256 investment agreements between technology firms in Latin America, half of them in Brazil, and foreign companies. Of all these agreements, 35% were with firms from the United States, which clearly dominates this sector, but 23% were with firms from Europe, which indicates that the European presence in this sector in the region is already significant (see figure VI.17).

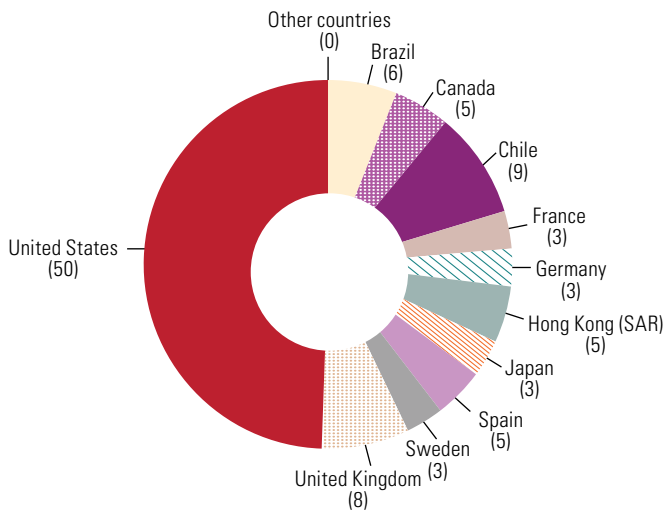


Figure IV.17
Distribution of investment agreements between Latin American and foreign firms by investor's country of origin, 2005-2017
(Percentages)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

In the case of digital start-ups, investments coming into Latin America are mainly from firms in the United States. Seventy-one per cent of foreign investment in Latin American start-ups comes from the United States, and only 13% from Europe (including investments catalogued as direct of portfolio investment or loans) (LAVCA, 2017).

[10] See [online] http://www.startupchile.org/economic-impact/.

This sector also sees a significant amount of financing through risk capital funds, which are also dominated by the United States, but with major exceptions from Europe. Seaya Ventures, for example, a Spanish venture capital fund specialized in digital firms, has shown interest in expanding into Latin America.

The best-known case of investment in this sector in Latin America is by the Spanish firm Cabify, which in 2017 announced an investment of US$ 200 million to expand its business in Brazil. The firm sees more possibilities for expansion in Latin America than in Europe (*Estadão,* 2017). This case illustrates how Latin America can offer European firms space to expand in this sector, as in renewable energies. Similarly, Latin American start-ups can tap opportunities for growth in Europe, through programmes such as Rising Startup Spain, which receives initiatives from firms from all over the world wishing to develop their business in Spain.

Although Europe is far behind the United States, and even China, in terms of developing digital firms, European investments in this sector could help Latin American countries to build capacities that will be crucial for the transformation of the region's economies.

E. The automotive sector: crucial for the development of new technologies in the region

1. General overview of the sector in the region and the role of European firms

The global automotive industry is in the throes of mutation. The need to decarbonize transport and, thus, to make electric vehicles, as well as to develop autonomous vehicles, is producing a shift in the sector and posing a series of challenges for the traditional industry. The sector is also very important in terms of investment, employment and exports, for Argentina, Brazil and Mexico and, to a lesser extent, for Colombia and the Bolivarian Republic of Venezuela. This section centres its analysis on European investment in Mexico and Brazil.

Between 2005 and 2017, 12% of all FDI projects announced in the region went to the automotive sector, and 35% of this investment was by firms from the European Union (see figure IV.18). The countries receiving this investment were mainly Brazil (46%), Mexico (42%) and Argentina (9%). These figures hide differences between types of investment. In fact, Brazil is the largest recipient (60%) of investment by European original equipment manufacturers (OEM), while Mexico receives the largest proportion of investment by European manufacturers of components (73%). This reflects the differences between the sectors in the two countries.

The importance of the automotive sector in these countries is evident. In 2017, Mexico became the seventh largest vehicle producer in the world, with an output of over 4 million units,[11] and the industry represented 3% of its GDP and 17.7% of its manufacturing value added in 2015 (Carbajal-Suárez and Morales-Fajardo, 2016). In 2017 the sector received almost a quarter (23%) of the FDI entering the country. The manufacture of automobiles, trucks, chassis and parts attracted an unprecedented

[11] See International Organization of Motor Vehicle Manufacturers (OICA), "2017 production statistics" [online] http://www.oica.net/category/production-statistics/2017-statistics/.

US$ 6.972 billion, 32% more than in 2016.[12] Brazil, meanwhile, is the world's tenth largest producer, with 2.7 million units made in 2017.[13] In 2013 the industry generated over 1.5 million direct jobs and contributed 5% of the country's total GDP and 21% of industrial GDP. Brazil has 29 assembly firms, 494 automobile parts manufacturers and 61 industrial units distributed in 10 states (Carbajal-Suárez and Morales-Fajardo, 2016).

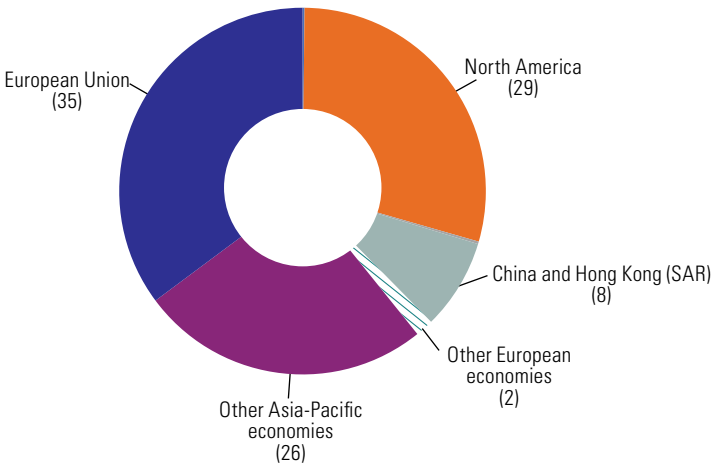


Figure IV.18
Latin America and the Caribbean: distribution of FDI announcements in the automotive sector, by region of origin, 2005-2017
(Percentages of total amount)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] https://www.fdimarkets.com/.

European firms represent a large share of automotive production in the region: 47% of production in Brazil and 38% in Argentina, in 2016 (see table IV.3). The share of European firms in Brazil fell between 2006 and 2016 owing to the entry of Japanese firms such as Toyota, Honda and Nissan, which have upped their production significantly over the past 10 years. Similarly, production by European firms in Mexico has risen over the past few years. In 2006, production in Mexico was still dominated by United States firms, since the Mexican industry developed in a manner that was highly dependent on its own region and in the framework of the North American Free Trade Agreement (NAFTA), as well as with an original aim of exporting to the North American market. However, European and Japanese firms have increased their share in the Mexican automotive industry in the last decade. In 2016, European firms achieved a share of 25%, compared with 19% in 2006.

The production figures mentioned are a consequence of the investment made by these firms. In fact, between 2005 and 2017 European investments in new projects in the automotive sector were almost exclusively in these three countries. Volkswagen is the largest investor in Argentina, with US$ 1.8 billion in projects announced in the 2005-2017, ahead of Fiat and PSA. Conversely, in Brazil's automotive sector, Fiat Chrysler Automobiles was the largest investor, followed by Volkswagen and Daimler AG.[14]

[12] ECLAC data, on the basis of official figures. These data are published in accordance with the fifth edition of the *Balance of Payments and International Investment Position Manual* (MBP5) (IMF, 1993).
[13] See Organization of Motor Vehicle Manufacturers (OICA), "2017 production statistics" [online] http://www.oica.net/category/production-statistics/2017-statistics/.
[14] See Financial Times, fDi Markets [online database] https://www.fdimarkets.com/.

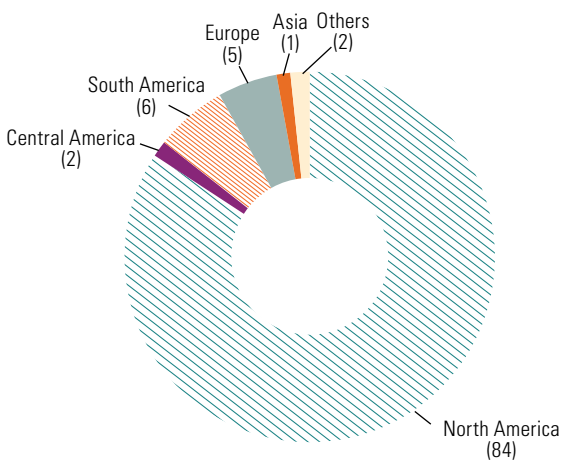
Table IV.3
Number of vehicles produced by firm and country of production
(Units and percentage share)

Firm	Brazil			Argentina			Mexico			Share of Latin America *(percentage)*		
	2006	2014	2016	2006	2014	2016	2006	2014	2016	2006	2014	2016
Volkswagen	630 982	500 104	324 128	46 815	20 425	19 557	348 391	475 121	425 431	18.1	10.1	7.6
Fiat	565 988	686 468	387 715	3 414	95 538	35 739	0	500 247	459 166	24.6	26.4	18.9
PSA Peugeot-Citroën	92 515	94 825	85 026	96 787	57 609	59 686	0	0	0	5.6	5.2	4.6
Renault	68 423	229 806	208 352	52 446	80 854	62 293	9 859	0	814	7.1	13.8	10.4
Daimler	50 194	0	0	19 839	0	1 899	28 722	0	0	4.8	-	0.1
Share of firms from the European Union *(percentage)*	**53.9**	**48.0**	**46.6**	**50.8**	**41.2**	**37.9**	**18.9**	**29.0**	**24.6**	**-**	**-**	**-**
General Motors	550 183	580 794	334 447	70 862	86 931	55 300	504 746	678 388	703 030	12.6	14.1	14.0
Ford	320 124	304 403	219 519	78 785	103 107	64 505	330 228	431 613	390 528	16.9	14.1	10.5
Share of firms from the United States *(percentage)*	**33.3**	**28.1**	**25.7**	**34.6**	**30.8**	**25.3**	**40.8**	**33.0**	**30.4**	**-**	**-**	**-**
Toyota	61 650	161 907	175 901	65 280	96 350	97 768	33 920	71 398	141 381	2.2	3.2	4.1
Nissan	0	34 088	45 490	0	0	0	407 222	805 967	848 086	12.6	16.5	16.1
Mazda	0	0	0	0	0	0	0	101 769	149 235			9.4
Honda	78 360	127 508	120 585	0	6 756	27 499	24 300	145 213	254 984	2.8	6.2	8.1
Share of firms from Japan *(percentage)*	**5.4**	**10.3**	**15.9**	**15.1**	**16.7**	**26.5**	**22.8**	**30.4**	**34.6**	**-**	**-**	**-**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the International Organization of Motor Vehicle Manufacturers (OICA).

In Mexico, the automotive industry has an FDI stock of over US$ 51.2 billion (11% of the total) and provides some 900,000 direct jobs (ProMéxico, 2016). International firms, including from Europe, produce basically for export, mainly to the United States, in the framework of NAFTA. Eighty per cent of Mexico's automotive production is exported, mainly to the other two members of NAFTA (86%) (see figure IV.19). Mexico's automotive industry has developed on the basis of its geographical advantages and its integration into the global value chain. In 2017, despite uncertainty over the future of NAFTA, exports rose by 1.7% over 2016. A challenge for the industry is the poor performance of the domestic market, in which sales have fallen recently (Rozenberg, 2018).

Figure IV.19
Mexico: exports of the automotive sector, by destination region, 2017
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Mexican Automotive Industry Association (AMIA), "Exportación por región de destino enero - marzo 2018 vs 2017" [online] http://www.amia.com.mx/expregion.html.

Conversely, in Brazil the main public policy objective has been to encourage carmakers to build local factories for supplying the country's enormous domestic market. Accordingly, major efforts have been made to adapt and develop original models and important technological innovations have been achieved, including flex-fuel engines that can run on either gasoline or ethanol. The Brazilian automotive sector employs over 500,000 people and 89% of the vehicles sold in Brazil in 2017 were produced in the country (ANFAVEA, 2018).

Brazil has been a relatively attractive destination for investment in the automotive sector. Between 2010 and 2013 the sector received total investment estimated at around US$ 17 billion, mainly from foreign firms (BNDES, 2014). Investments in Brazil have been driven by the considerable size of the local market, local content incentives and access to the Southern Common Market (MERCOSUR). The MERCOSUR Customs Union provides free trade with the Argentine market, the destination of much of Brazil's automotive sector foreign trade. Only 766,013 of a total of 2.7 million vehicles manufactured in Brazil in 2017 were exported, although the percentage of automobiles exported has risen considerably in the past few years (see figure IV.20). Around three quarters of Brazil's automobile exports go to Argentina.

Figure IV.20
Brazil: automotive sector production, imports and exports, 2000-2017
(Number of vehicles and percentages exported)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of National Association of Motor Vehicle Manufacturers of Brasil (ANFAVEA) [online] http://www.anfavea.com.br/estatisticas.html.

2. The quality of investments in the automotive sector

The activities of European automotive firms have certain characteristics that are relevant in terms of their contribution to development. Firstly, in the past decade, they have carried out an extensive process of expanding and upgrading their production platforms in Latin America, including recent investments in technology centres. Secondly, European firms have boosted the creation of production linkages, with specific supplier support programmes. Thirdly, the increase in production and production linkages has impacted positively on employment.

In 2016, Volkswagen opened the first Audi plant in North America, and one of the most modern, in Puebla (Mexico), to make the new Q5 model for worldwide exports. Given that the plant uses some of the most advanced production techniques employed by the firm anywhere in the world, it was decided to build a training centre for staff in collaboration with the local government and a university. In addition, to optimize efficiency, the employees of intermediate suppliers also received training at the centre. As a result, the Audi plant and training centre have raised the skills levels of many workers in the area. As well as Volkswagen, the project also involves another German firm, Siemens, which makes some of the electronic components for Audi vehicles.

Brazil has a broad framework of incentives for investment in the sector, called Innovar-Auto, aimed at reducing the number of imported automobile parts and supporting local production. This policy is intended to increase local content, attract FDI, boost R&D, technology and innovation capacities, and grow the industry and employment (Sturgeon, Lima Chagas and Barnes, 2017). To that end, the law offers tax incentives associated with local content and spending on R&D (Palmeri, Vendrametto and Mendes dos Reis, 2014). Sturgeon, Lima Chagas and Barnes (2017) estimate that the programme is responsible for half of all investments in the sector since 2012.

Carmakers today tend to outsource most their parts production to external, increasingly international, suppliers. In Brazil more European firms are applying strategies of support and collaboration with their suppliers, while in Mexico the approach is geared more towards encouraging competition between suppliers.

The Volvo plant in Brazil, for example, generated linkages that increased its suppliers' technological capacities. A study by Ivarsson and Alvstam (2005) on Volvo heavy trucks and bus plants shows that international suppliers had captured a dominant proportion of local procurement in Brazil, but also that a substantial part of Brazilian suppliers had received technical assistance from Volvo as part of the trading relationship. According to a more recent study, by Dal Ponte, Charterina Abando and Basterretxea (2017), Volvo tends to collaborate with its suppliers in the development of new products, recognizes them as an important source of innovative ideas and treats collaboration as a cornerstone of its strategy. Volvo also has a policy of single-source suppliers, which makes for a longer and closer relationship with dedicated suppliers, often under long-term agreements. This strategy does not seem to have changed after the acquisition of the firm by the Chinese group Geely.

Another case study on the automotive industry in Brazil found that being assembly plant providers helped local suppliers to be more competitive and to gain new market share (Campos Pereira Bruhn and others, 2015).

Brazil has also received investment in R&D activities. Owing to its market size and with a view to adapting their products to local specifications, most carmakers have R&D and design centres alongside their plants in Brazil. Volkswagen and Fiat Chrysler have design centres in the country, for example. The PSA Group, despite having a more centralized innovation strategy, also has an R&D and design centre with offices in São Paulo and Porto Real in Brazil, as well as in El Palomar in Argentina. The Group has also set up a special skills centre devoted to local biofuels and their combustion.[15]

A good example of European investment in the R&D sector in the country is Fiat Chrysler. In fact, Fiat Brazil is the company's largest R&D subsidiary by employment, production and R&D spending. Fiat established its first R&D centre in Brazil in 1996 and now has two such centres, in Betim and Recife, employing around 1,500 people. The Brazilian centres can develop complete vehicles, from strategic planning to design and production. Despite the recent crisis, in 2015 a new innovation centre was set up in

[15] See [online] https://www.groupe-psa.com/en/automotive-group/international-presence/latin-america/.

Pernambuco, which now employs mechanical, metallurgical, chemical and production engineers, as well as software engineers, mechanics and test drivers. In order to train and qualify these professionals, Fiat Chrysler entered into partnership with eight educational institutions in Pernambuco and Paraíba, to create specific courses by adapting study plans and developing new projects, research lines and training.[16]

These examples illustrate how the long history of European automotive firms in Brazil has crated linkages between local and European firms, allowing a degree of technology transfer and local presence that supports the creation of quality employment and the development of a sector that is vital to the country's economy today.

3. The automotive sector in Latin America and the challenges of global shifts

The automotive sector is facing sweeping technological and social changes (ECLAC, 2017). Most broadly, the concept of mobility is changing and traditional modes of transport such as buses, city railways or car ownership are no longer the only alternatives. The new means of transport, such as bicycle-sharing, car-sharing and new taxi services, such as Uber or Easy Taxi, are developing worldwide, particularly in cities and among young consumers.

Consumers' preferences are changing not only in developed countries, but also in Latin America and the Caribbean. For example, according to a study by Deloitte (2017), 97% of automobile consumers in Mexico today use vehicles with gasoline engines, but the five-year trend is that 78% of consumers in what is termed the "Y generation" or "millennials" prefer alternative engines; of these 38% will aspire to a hybrid-electric car, followed by 15% who will opt for electric hybrid vehicles and 11% will prefer battery powered cars.

Latin America and the Caribbean is the most urbanized region in the world, with over 80% of its population residing in cities, which makes it a huge potential market for a future in which the gasoline-powered car will no longer be the norm. Latin America has some of the world's largest cities and the region therefore suffers from the problems associated with urban mobility mainly congestions and poor air quality.

The advent of new business models for mobility has a major impact on traditional market structures and on the positioning of the traditional participants in the ecosystem amid the new competition. This leads to changes in regulations, investments and market structure. These changes could represent challenges, but also opportunities, for the region (see box IV.2).

On the one hand, the development of car-sharing could have negative impacts on demand for vehicles, even if the vehicles used in the shared-use modalities have to be renewed more often. Car manufacturers have already established links with platforms such as Uber and Lyft to anticipate these new changes in the business model.

On the other hand, these changes also affect the content, in terms of parts and technology, of future electric or autonomous vehicles. These new vehicles could represent an opportunity for the region to strengthen its automobile manufacturing and upgrade its technological level. This is already being seen in the new investments in the sector. For example, the new plants, such as those of Audi in Puebla (Mexico) and Fiat in Brazil, are high-tech facilities, which is why European firms have established partnerships with local universities and training centres.

[16] See [online] http://mundofca.com/en/innovation-network/.

Box IV.2
Autonomous vehicles: a new challenge for the automobile industry

Several recent studies show that, in the era of autonomous and electric vehicles, automobiles will become shared assets. According to a study by McKinsey & Company (2016), up to 15% of new vehicles sold in 2030 could be totally autonomous and 10% could be shared vehicles. Another study, by The Boston Consulting Group (BCG) (Brian Collie and others, 2017), estimated that, by 2030, fleets of shared autonomous electric vehicles will represent almost 25% of all the miles travelled by automobile passengers in the United States. The shift to a shared electric vehicle could reduce the number of cars on city streets by 60%, emissions by 80% and road traffic accidents by 90%. This transformation will occur in Latin America too. For example, according to a study by Frost and Sullivan (2018), these trends will lead to a paradigm shift in Latin America, from vehicle ownership to the use of transport services, by 2023.

Autonomous vehicles could also have a major impact on various sectors, such as infrastructure and urban design. One of the first industries to be affected will probably long-distance transport and commercial delivery. Since human fatigue will no longer be a determining factor, trucks will be able to operate 24 hours a day, seven days a week, delivering products more rapidly. In addition, the availability of more precise data will contribute to increasing transport and delivery efficiency. Automobiles today may sit unused 95% of the time, so a widespread shift to autonomous taxis (robots) would allow the reassignment of urban land wasted on parking. At the same time, automobile-to-automobile communications will enable autonomous cars to travel closer to one another, which will allow the use of narrower carriageways and achieve a faster flow of traffic. This could change the way in which city infrastructure is ultimately designed and administered. However, the adoption of autonomous vehicles depends on three main requirements (the technical challenges, the regulatory challenges and consumer acceptance) and the progress made in these three aspects will depend on the pace of adoption of the fully autonomous vehicle.

The reduction in car ownership will likely have a profound impact on the automobile industry and on society in general. Studies show that global automobile sales continue to grow, but the annual rate of growth is expected to fall from the 3.6% of the past five years to around 2.0% by 2030. In fact, the new mobility services could lead to a fall in the sales of private vehicles, but this drop will probably be offset by a rise in shared-use vehicles, which need to be replaced more often owing to their greater use and related wear-and-tear.

As has occurred before with other industries, such as telecommunications and the production of mobile phones, the automotive industry is on the brink of profound changes. Until now, only two new actors have emerged on the list of the 15 largest OEMs in the past 15 years. However, a paradigm shift towards mobility as a service, together with new players, will inevitably force traditional carmakers to compete on multiple fronts. Suppliers of mobility (Uber, for example), technology giants (such as Apple and Google) and specialized OEMs (Tesla, for example) make the competitive panorama more complex. In this content, partnerships and acquisitions by OEMs of autonomous vehicle start-ups or firms with reserves of chauffeured cars, such as Uber or Lyft, have already begun to occur. In fact, carmakers will have to reinvent themselves as "mobility providers".

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Brian Collie and others, "The reimagined car: shared, autonomous, and electric", BCG, 18 December 2017 [online] https://www.bcg.com/en-cl/publications/2017/reimagined-car-shared-autonomous-electric.aspx; McKinsey & Company, "Disruptive trends that will transform the auto industry", January 2016 [online] https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/disruptive-trends-that-will-transform-the-auto-industry; *The Economist*, "Reinventing wheels: autonomous vehicles are just around the corner", 1 March 2018 [online] https://www.economist.com/news/special-report/21737418-driverless-vehicles-will-change-world-just-cars-did-them-what-went-wrong; Frost & Sullivan, "eHailing, bike sharing and integrated mobility to become the new growth engines of the Latin American automotive business by 2023", 2 January 2018 [online] https://ww2.frost.com/news/press-releases/ehailing-bike-sharing-and-integrated-mobility-become-new-growth-engines-latin-american-automotive-business-2023.

F. Conclusions

Firms in the countries of the European Union represent a very important source of investment for Latin America. These firms possess a long tradition in the subregion, which has gained strength over time in terms of both countries and destination sectors.

Over 50% of the FDI received by Latin America over the past few years has come from European Union countries and between 2005 and 2017, 39% of the total value of new foreign investment projects announced in the region corresponded to European Union firms.

Not only does European FDI represent a very considerable flow of capital, it has marked sectoral trends, which have become more marked in the last decade. In effect, especially after the end of the high-commodity-price cycle, in 2011 and 2012, renewable energies, telecommunications and the automotive industry have become the three most important sectors for European investors in Latin America.

Between 2005 and 2017, 65% of all investment projects in renewable energies in Latin America corresponded to European firms. In telecommunications, European firms accounted for 43% of the total in the same period, while in the automotive sector the average was 35%, higher than for firms from the United States (29%).

These figures help to grasp the magnitude of the presence of European transnationals in Latin America while also highlighting the opportunity that these investments represent for strengthening the production structure of the countries of the region.

On repeated occasions, ECLAC has underscored the importance of moving towards quality FDI (ECLAC, 2016 and 2017), which means leveraging the dynamic and permanent benefits of foreign investment. These benefits are manifested in terms of human resource training, transfer of knowledge and technology, implementation of innovation processes and creation of high-quality employment. Should these positive effects materialize, there are sectors that by their nature can help boost the transformation of the region's production structure towards a sustainable development path with a larger role for knowledge- and innovation-intensive sectors, as well as the production of environmental goods and services. Quality FDI is not simply investment that indirectly benefits local knowledge and capacities, but investment that also contributes towards the achievement of the most important Sustainable Development Goals.

European firms in the three sections examined are global leaders in their areas, in knowledge generation and technology, and have been building capacities in their home countries for decades. They have a very strong presence in the region, which translates into major opportunities for countries hosting investments. However, it is important to underscore that these are opportunities, not automatic processes that will come to fruition on their own.

To tap the opportunities offered by FDI from Europe, national policies are needed to promote the development of a production fabric —networks of goods and services providers— that will favour investment decisions by European transnationals while also enabling the transfer of knowledge and technology to local territories. There are experiences in this regard in several countries of the region, in particular in renewable energies and the automotive industry, but there is still a need for a comprehensive strategy in relation to FDI.

It is not simply a matter of creating the conditions to attract foreign capital, but of ensuring that investments become powerful generators of technological and productive spillovers geared towards sustained, inclusive and sustainable growth. In this regard,

national production development strategies should be actively directed towards these objectives and, in addition, cooperation between Latin America and the European Union should target a significant part of its efforts on developing strategic partnerships between firms and institutions on the two continents. This with a view to helping shape a growth trajectory that strengthens and adds value to local capacities and heads increasingly towards a new production and consumption model that is sustainable and inclusive. By joining private enterprise with public initiative, it would thus be possible to tap the knowledge and capacities of European firms operating in Latin America, and to generate new, high-quality investments.

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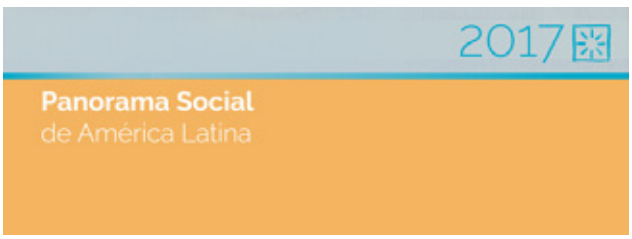

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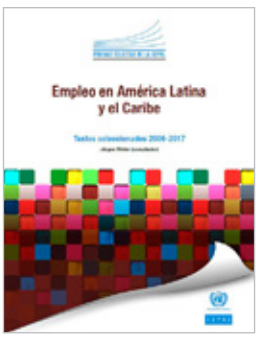

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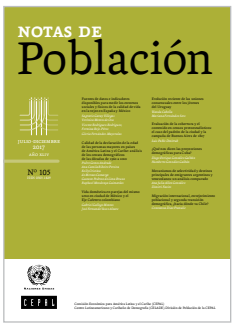

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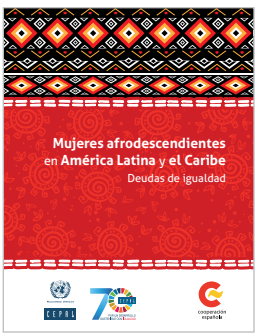

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