2017

Foreign Direct Investment
in Latin America and the Caribbean

UNITED NATIONS

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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

This publication sets out and analyses the main foreign direct investment (FDI) trends in the countries of Latin America and the Caribbean. The 2017 edition shows that the region is at a difficult juncture. FDI inflows declined by 7.8% in 2016, to US$ 167.180 billion, representing a cumulative fall of 16.9% since the peak in 2011.[1] The fall in commodity prices continues to affect investments in natural resources, sluggish economic growth in several countries has slowed the flow of market-seeking capital, and the global backdrop of technological sophistication and expansion of the digital economy has concentrated transnational investments in developed economies.

A. Foreign direct investment in Latin America and the Caribbean

The perception of globalization and its economic and social effects reached a turning point in 2016. Political events, such as the referendum in the United Kingdom which resulted in the vote to leave the European Union (Brexit) and the presidential election in the United States, reflected trends that had developed over time in global production and trade. Developed economies have been more interested in repatriating production, which together with the rapid technological transition and greater competitive pressure, has redirected businesses towards more technology-intensive markets.

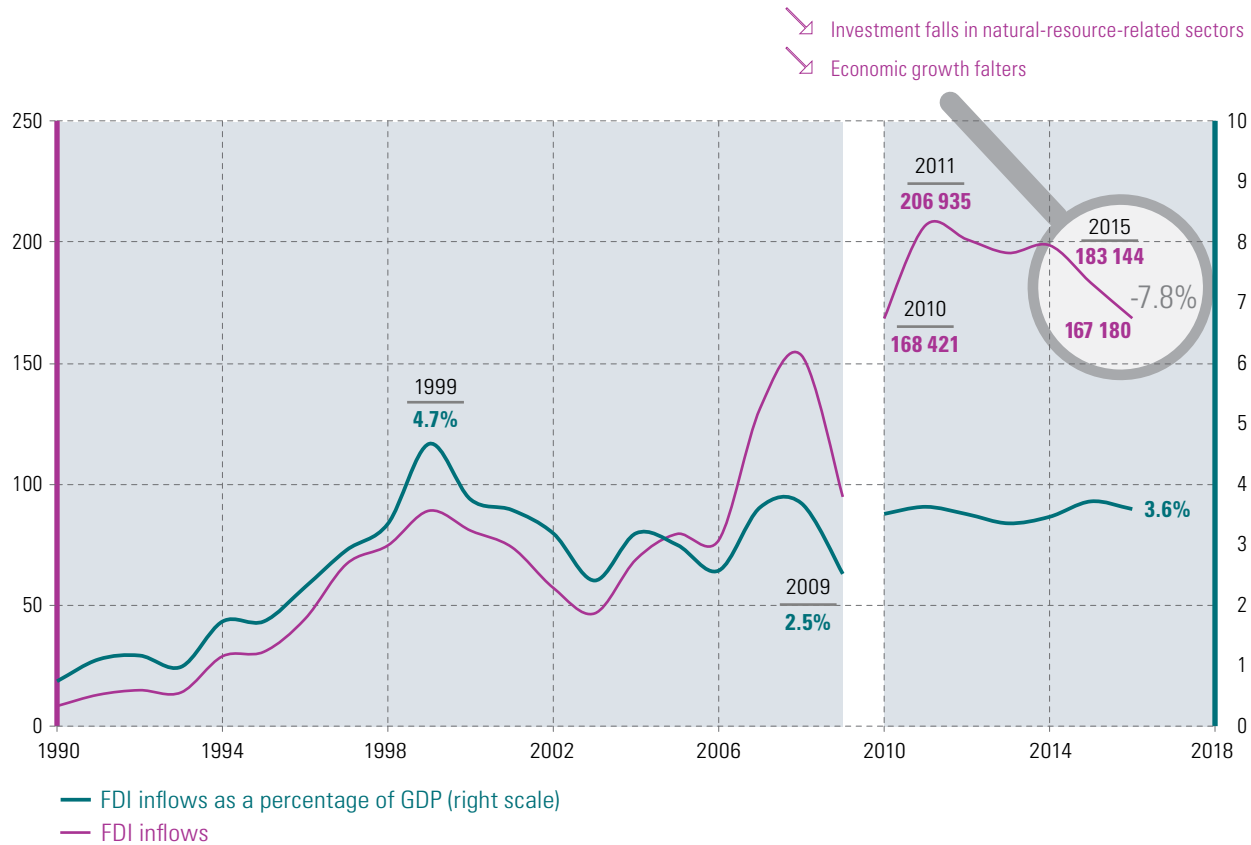
FDI inflows declined by 7.8% in 2016, to US$ 167.180 billion.

In 2016, global FDI inflows amounted to US$ 1.7 trillion, higher than any of the annual figures between 2008 and 2014, but 2% lower than in 2015. Developed economies regained the lead, receiving 59% of FDI flows, with their inflows climbing by 5%. Developing economies received 37% of the total and their FDI inflows fell by 14%. All the developing subregions received less investment, with Asia seeing decreases of 15% and Africa, 3%. Cross-border mergers and acquisitions played a large role, especially in developed economies, driven by greater international liquidity and industry strategies that led to major operations. Meanwhile, China was the second biggest provider of global FDI, after the United States, as its foreign investments increased steadily, particularly acquisitions in the European Union and the United States. China's "Go Global" strategy, launched more than a decade ago, has consolidated its role as a global player that is integrating into the workings of increasingly sophisticated sectors, by actively engaging with new technological trends of the fourth industrial revolution.

In this scenario, the Latin American and Caribbean region is losing ground as a recipient of FDI, with inflows decreasing for the second year in a row to levels similar to those seen six years ago (see figure 1). In spite of this, FDI flows stood at 3.6% of gross domestic product (GDP), while the global average was 2.5%, revealing the importance of transnational corporations in the region's economies.

[1] The variations were calculated on the basis of data that exclude the Bolivarian Republic of Venezuela and Trinidad and Tobago as no information is available for those countries for 2016.

Figure 1
Latin America and the Caribbean: foreign direct investment inflows, 1990-2016
(Billions of dollars and percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures as of 15 June 2017.
Note: FDI figures do not include flows to the main financial centres of the Caribbean. FDI figures indicate FDI inflows, minus disinvestments (repatriation of capital) by foreign investors. These figures differ from those used in the 2017 editions of the *Economic Survey of Latin America and the Caribbean*) and the *Preliminary Overview of the Economies of Latin America and the Caribbean*, because they show the net balance of foreign investment, that is, direct investment in the reporting economy (FDI) minus outward FDI. The figure for 2016 does not include the Bolivarian Republic of Venezuela or Trinidad and Tobago as no information was available for those countries, which were therefore excluded from the calculation of the variations. Since 2010, figures for Brazil include reinvested earnings from FDI; as a result, these figures are not directly comparable with those from before that date. This is represented by the break in the lines.

The situation among countries and subregions has been heterogeneous, but few economies saw higher levels of FDI. Despite the recession, Brazil remained the main recipient of FDI (47% of the total) and investments increased by 5.7%, albeit not as a result of new capital inflows, but owing to an increase in loans between transnational corporations. Mexico failed to maintain the growth of previous years with FDI falling by 7.9%. Nevertheless FDI in Mexico remained at historically high levels and the country was the second largest host country (19%). Inflows into Colombia rose by 15.9%, making it the economy with the third highest inflows (8% of the total). This was the result of a major acquisition in the energy sector and higher investment in services, although inflows still did not reach the levels seen at the peak of the commodity price boom. With the exception of Paraguay, FDI inflows to other South American countries decreased. Chile was the region's fourth largest destination country despite inflows falling by 40.3% In Central America, 44% of inflows to the subregion went to Panama, which saw its fourth consecutive year of growth (up 15.9%), while Costa Rica received 27%, up by just 1.1%. In the Caribbean, the Dominican Republic received 49% of inflows to the subregion, up 9.2%. Jamaica was in second place, with 16% of the total and a fall of 14.5%. The members of the Organisation of Eastern Caribbean States (OECS) received 5.8% less than in 2015, and accounted for 11% of inflows to the subregion.

After the end of the commodity price boom, investment in extractive industries slowed and this sector's share of FDI has been falling since 2010, down to 13% of the total in 2016. By contrast, the share of manufactures and services increased to 40% and 47%, respectively. The new investments announced were concentrated in renewable energies, telecommunications and the automotive industry, with the region receiving 17%, 21% and 20%, respectively, of overall investment. Meanwhile, for a second year in a row, the renewable energy sector attracted the most investment, receiving 18% of the total announced for the region, with a third of those investments going each to Chile and Mexico.

There has been no diversification in terms of investor countries. Of total inflows, 73% came from either the United States (20%) or the European Union (53%). Of those from the European Union, 12% came from the Netherlands and 8% from Luxembourg, which both offer tax advantages, meaning that they are used as a base by transnational corporations from third countries so that the ultimate origin of funds from these two countries is not immediately clear. Spain accounted for 8% of outflows, Canada and the United Kingdom, 5% each, Germany, Italy and France, 4%, and Japan, 3%. According to official statistics, China, which has ramped up its FDI outflows significantly, accounted for just 1.1% of inflows to the region. This figure underestimates the amount of Chinese capital in the countries of Latin America and the Caribbean; in fact, when the value of mergers and acquisitions in 2016 is taken into account, China was the fourth largest investor in the region, after the United States, the European Union and Canada. Given the major operations that China has undertaken in the first half of 2017, its share is expected to increase next year.

Declining returns on assets could worsen the investment outlook for the region. The FDI stock expanded by 12.8% in 2016 to reach a new all-time high, while average returns —calculated as the ratio between FDI earnings and capital stock— declined again and reached a 15-year low, at 4.2%. Around 55% of this income was repatriated to home countries, meaning that there was a relative increase in reinvested earnings compared with the repatriated earnings. Average FDI profitability fell in all the countries except Panama, and the falls were steepest in the mining countries.

As well as being a year of lower investment in general, 2016 was also a weak year for the trans-Latins, with FDI outflows from the Latin American and Caribbean countries down by 47% to US$ 25.567 billion. Unlike in 2015, when the heaviest fall was posted in Brazil, in 2016 outward investment was down almost across the board, with the exception of Argentina and Colombia. Firms from Mexico, Colombia and Chile engaged in the most cross-border mergers and acquisitions, especially in construction and construction materials.

Lastly, in 2016 global FDI flows stagnated, although they remained at high levels. Developed countries resumed the leading role that they had lost in previous years. In contrast, a number of developing countries and regions that had benefited from the price boom in natural resources saw their FDI inflows drop.

In this scenario, foreign investments that help to narrow the region's production and social gaps are increasingly important. FDI can be a key factor in technology transfer and the adoption of new management systems and business models that increase competitiveness and productivity. However, the positive effects of FDI are not automatic. The results in terms of integrating technology, promoting research and development and creating good-quality jobs have, in most cases, fallen short of expectations. It is therefore important to review and improve Latin American and Caribbean countries' strategies for attracting FDI, so that they focus more on modernizing the economy and diversifying production.

It is important to review and improve Latin American and Caribbean countries' strategies for attracting FDI, so that they focus more on modernizing the economy and diversifying production.

B. Disruptive change in a leading sector: relocation, business models and technological revolution in the global automotive industry

Over previous decades, manufacturing became markedly global, with many operations moved from advanced economies to developing economies to cut costs. This paradigm has been called into question recently, however, by both firms and governments, and manufacturing has gained increasing importance as a source of productive linkages, scientific and technological capabilities and innovation in domestic economies.

The automotive industry is in the throes of a far-reaching transformation and is becoming a catalyst and driver of major technological and productive changes. Although vehicle manufacturers have been leading this process for many decades, suppliers of parts, components and accessories have recently become increasingly important in the production chain, powering technological development.

In stylized terms, the industry is concentrated in three macroregions: North America, the European Union and Asia. A small group of countries maintain strong hegemony in terms of production, vehicle manufacturing, supply and technological development: the United States, Germany, Japan, Republic of Korea and China. The first three of these have dominated the industry for decades, but China has been growing rapidly and has now become the world's largest vehicle producer (see figure 2).

In this context, fierce competition, consumer pressure and rapid technological progress have favoured the consolidation of manufacturers and suppliers, the emergence of new alliances between firms in the production chain and with enterprises from other industries, and the need to deploy flexible production models that offer customers a wide range of alternatives.

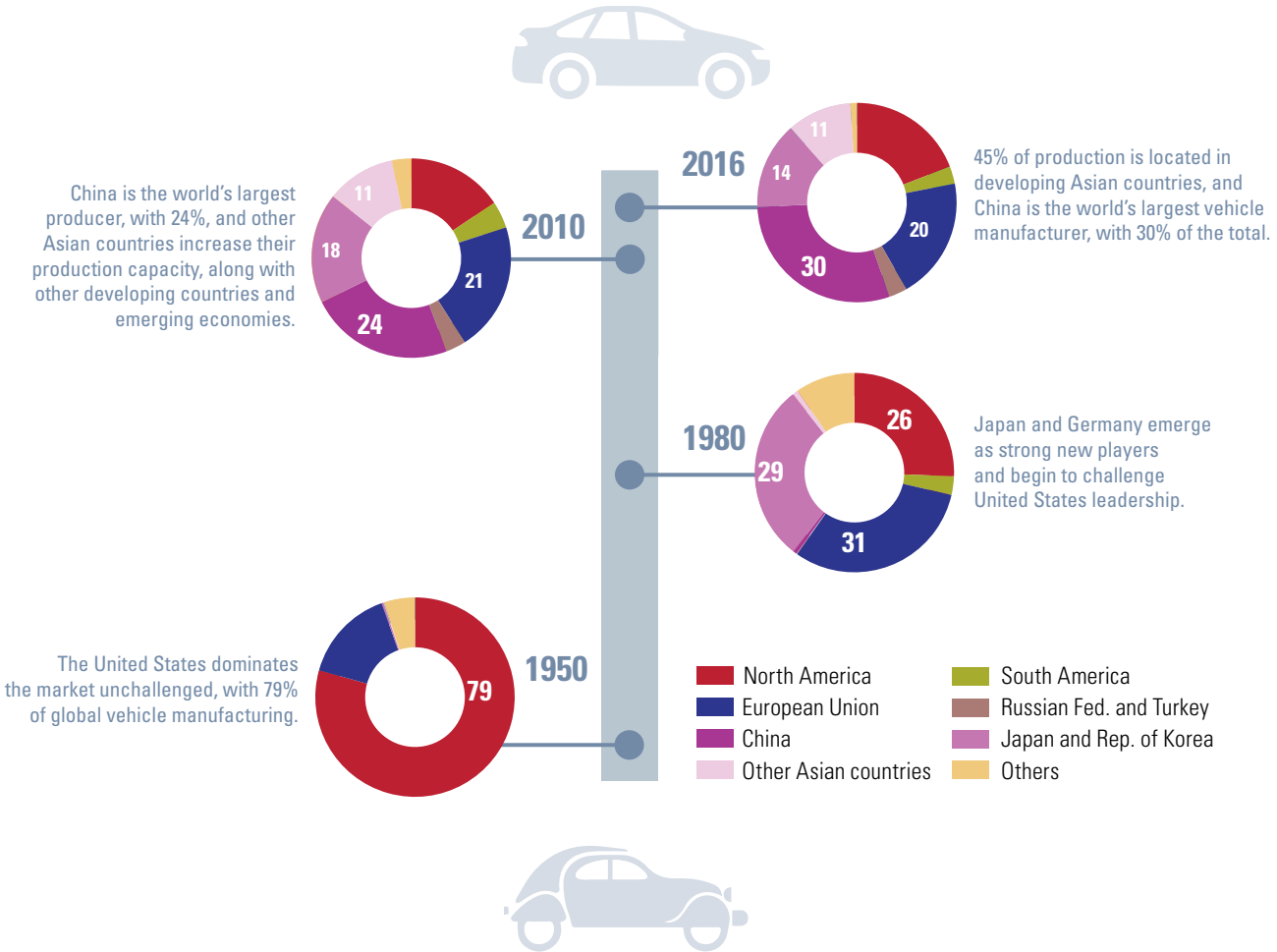
In the production sphere, new platforms are appearing that combine large-scale manufacturing with increasing flexibility. Over the coming years, the main manufacturers will concentrate much of their global production in a small number of new modular platforms, increasingly focused on areas of specialization and passing increasing areas of responsibility to their suppliers. In fact, manufacturers are caught in a crowding-out dynamic whereby they constantly require more and better highly innovative and technological features to remain competitive.

This dynamic is forcing firms to increase funding for research, development and innovation. In fact, 5 of the 20 firms that invest the most in R&D worldwide are in the automotive sector. While manufacturers invest an average of around 5% of their sales in R&D, suppliers of parts, accessories and components have an R&D intensity of close to 10%. Supplier firms thus try to satisfy the manufacturers' demanding requirements in order to hold on to the contracts signed between them.

The industry now faces new, potentially disruptive challenges that could greatly alter its structure in the near future.

Despite the good results achieved by the industry since the 2008 financial crisis, it now faces new, potentially disruptive challenges that could greatly alter the structure of the sector in the near future. There are at least three major trends that will determine its dynamic in the coming years: convergence with the digital economy, changes in the concept of mobility and in consumption patterns, and regulatory requirements in the fields of safety, the environment and energy efficiency.

Figure 2
Vehicle production, selected regions and countries, 1950-2016
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).

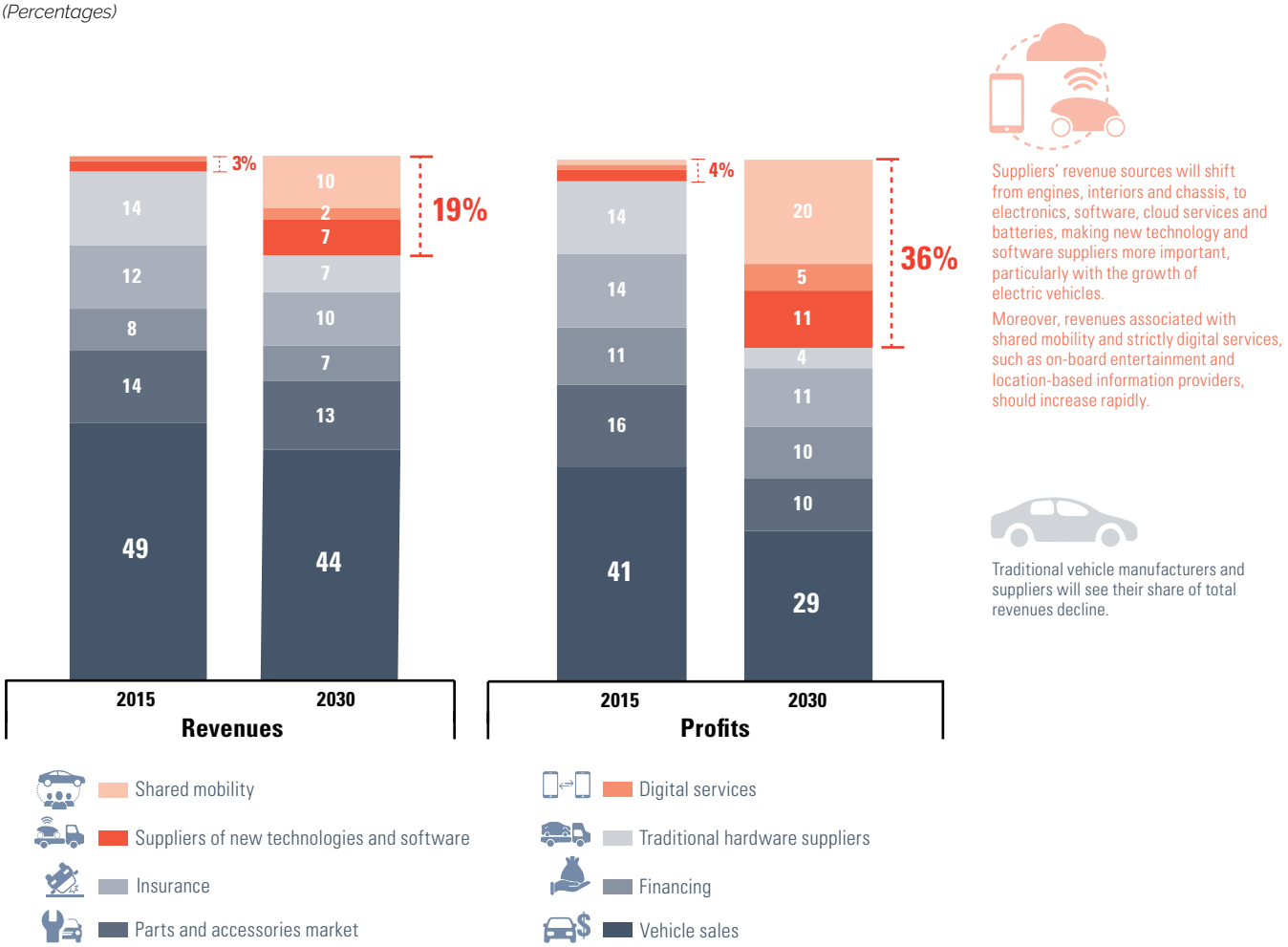
Faced with these changes, the broader industry market is also set to change significantly. Between 2015 and 2030, while the share of vehicle sales can be expected to fall from 50% to 28%, shared mobility services will grow from 0% to 20%. Traditional suppliers will see their market share decline from 10% to 3%, while suppliers of new technologies, electronics and software will grow theirs from 1% to 10% (see figure 3).

The industry is experiencing a colossal disruption in which electronics, digitization and software are the key elements. A vehicle today has about 60 microprocessors, four times more than a decade ago. In 2005, electronics and software accounted for about 20% of the total cost of a vehicle; today this figure reaches 35% and is expected to be over 50% by 2030, and as much as 75% in the case of electric vehicles.

The incorporation of digital technologies in vehicles allows for rapid progress in connectivity and autonomous driving. About 75% of the new vehicles sold in 2020 are expected to be connected. The rapid spread of these features will help lower their cost and incorporate them into most vehicles, regardless of the sale price. While many of these features are currently limited to high-end models, which use them as a differentiating factor, they will quickly become generalized and extended to mass-market vehicles. Thus, the incorporation of new technologies will not necessarily translate into higher prices.

The incorporation of digital technologies in vehicles allows for rapid progress in connectivity and autonomous driving.

Figure 3
Global automotive industry: revenues and profits, 2015 and 2030
(Percentages)

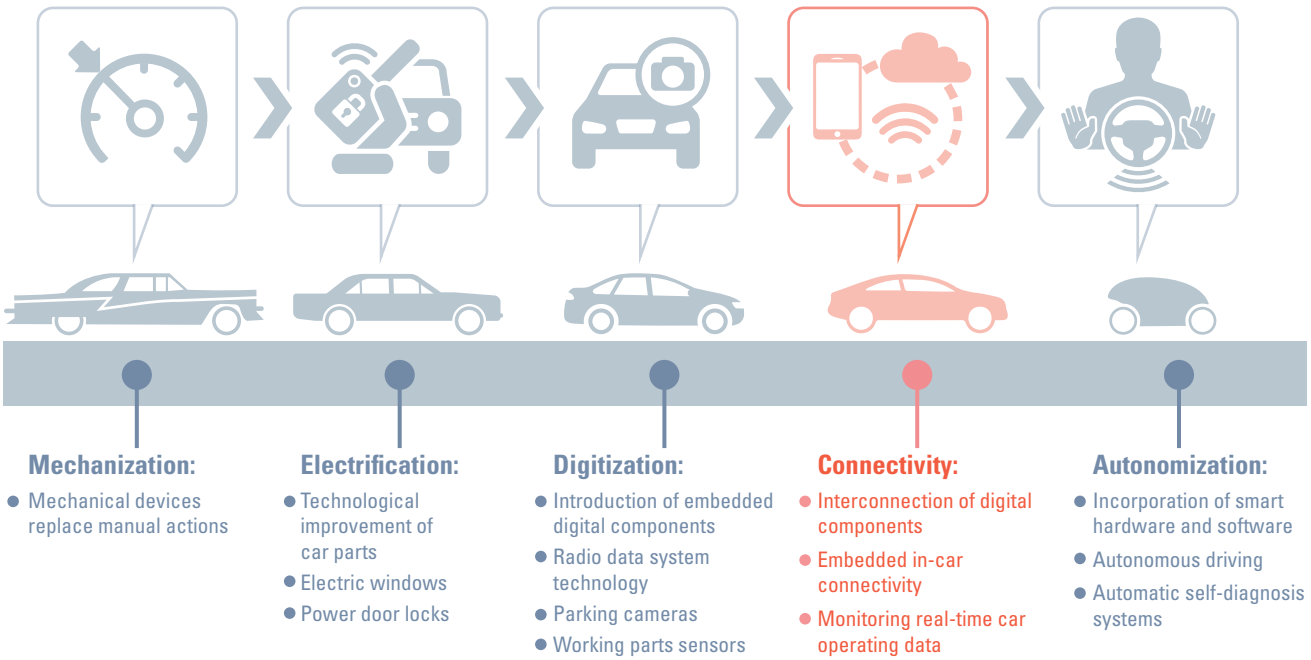


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of PwC, *Connected Car Report 2016: Opportunities, Risk, and Turmoil on the Road to Autonomous Vehicles*, 28 September 2016 [online] https://www.strategyand.pwc.com/media/file/Connected-car-report-2016.pdf.

Alongside connectivity, autonomous driving is also spreading rapidly (see diagram 1). Major manufacturers are announcing new models with a high degree of automation by 2020. Although German and Japanese firms are at the forefront in this area, United States manufacturers also aim to gain a major stake. These advances are attracting digital platforms that have not previously shown interest in the automotive industry. Examples include Apple, Google, Uber, Intel and Samsung, which are becoming involved in different areas, from vehicle manufacture to the development of components and services linked to connectivity and autonomous driving.

These advances, coupled with other macro trends, such as overpopulation, congestion in large cities and pollution, are changing consumption patterns and the regulatory requirements facing the industry. Firstly, manufacturers see consumer loyalty weakening, as people begin to doubt the urgency of purchasing a vehicle or even the need. Against this backdrop, many firms are expanding the frontiers of the industry and entering new shared mobility and private transport services. Secondly, technological progress (mainly in batteries) and public policies that seek to mitigate the effects of climate change are driving the development of electromobility. Some countries, led by China, Norway and the United States, have introduced incentives that help overcome consumer fears about electric vehicles: low autonomy, high prices, and sparse recharging infrastructure.

Diagram 1
Automotive industry: technology embedding



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Statista, *Digital Market Outlook. Connected Car Market Report*, New York, March 2017.

In short, the automotive industry is experiencing the greatest revolution in its history: its frontiers are expanding and new products and business models are emerging. The convergence between traditional manufacturing and software is shifting the structure of the production chain and the leaderships within it. Although great expectations surround the new forms of mobility and the role of the automotive industry in it, many questions remain to be answered in this regard.

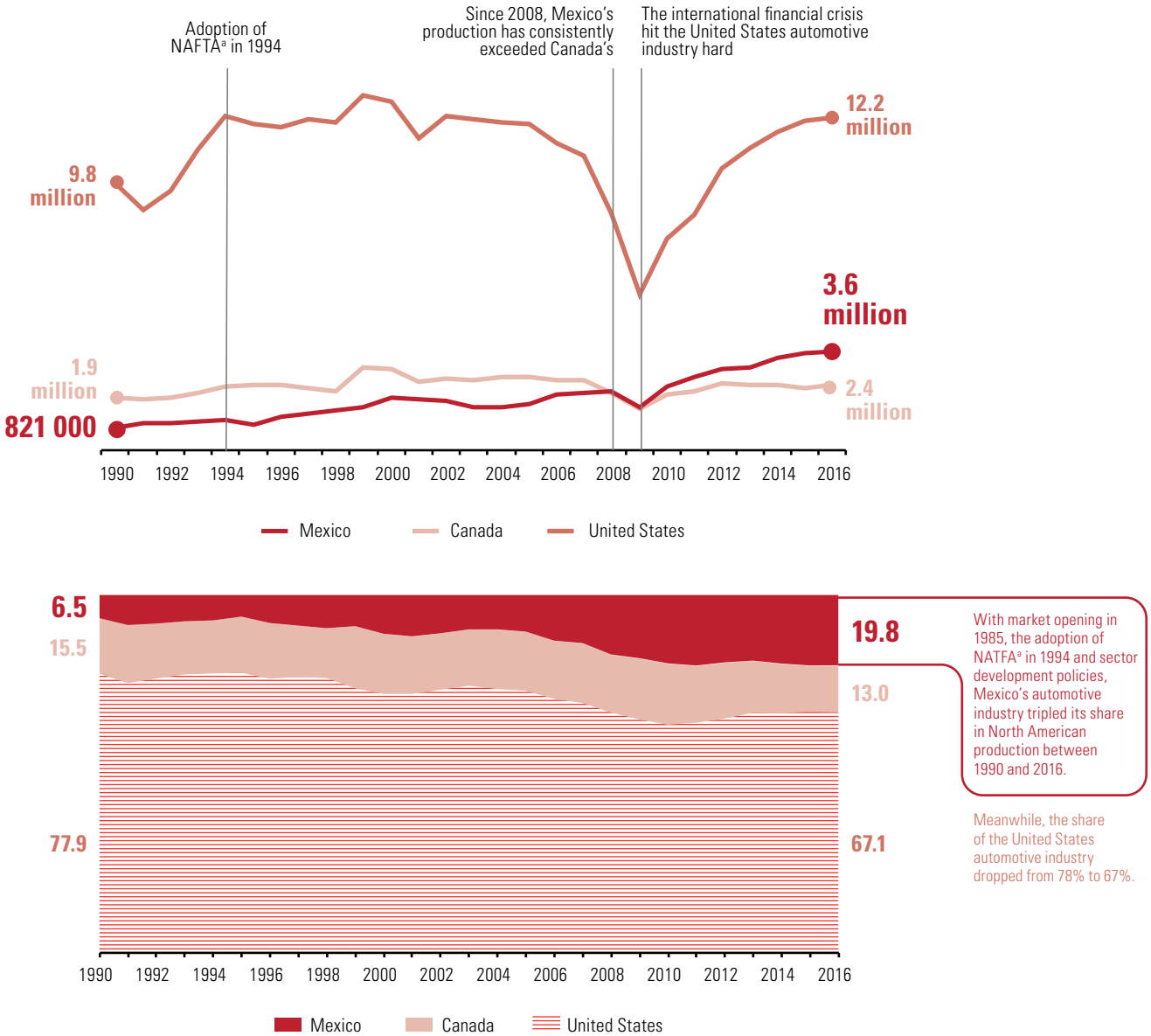
C. The automotive industry in Mexico: a success story under pressure

Although North America remains one of the three main hubs of the global industry, it has lost ground over the past few decades. Among the member countries of the North American Free Trade Agreement (NAFTA), however, Mexico has gained in stature: by virtue of intensive investment, it has become one of the leading suppliers to the United States, the world's second largest motor vehicle market (see figure 4).

The Mexican automotive industry now contributes over 3% of the country's GDP and 18% of its manufacturing output. It runs a yearly trade surplus of US$ 52 billion, represents over US$ 51.2 billion in cumulative FDI inflows between 1999 and 2016 (11% of the total) and employs 900,000 workers directly. Today, 80% of Mexico's motor vehicle production is exported and 86% of these exports go to Canada and the United States. Mexico has thus become the world's seventh largest supplier and the fourth largest exporter.

This process has gathered pace over the past few years, especially since the international financial crisis, and in the process Mexico has gone from being a low-cost platform for mass-market vehicle assembly to an integrated production chain that is more diversified in terms of products and technological sophistication. This is leading Mexico to develop a denser and higher-tech productive fabric, which should strengthen its position in an industry that is under heavy pressure from the new —and potentially highly destabilizing— trends.

Figure 4
North America: vehicle production by country, 1990-2016
(Units and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).
[a] North American Free Trade Agreement.

The outlooks for Mexico's motor vehicle industry will depend on at least two independent sets of factors. On the one hand is the transformation driven by the technology revolution under way in the global automotive industry, changes in the concept of mobility and consumptions patterns, and regulatory pressure in the fields of safety, the environment and energy efficiency. On the other hand is the uncertainty triggered by the announcements of the new Administration in the United States.

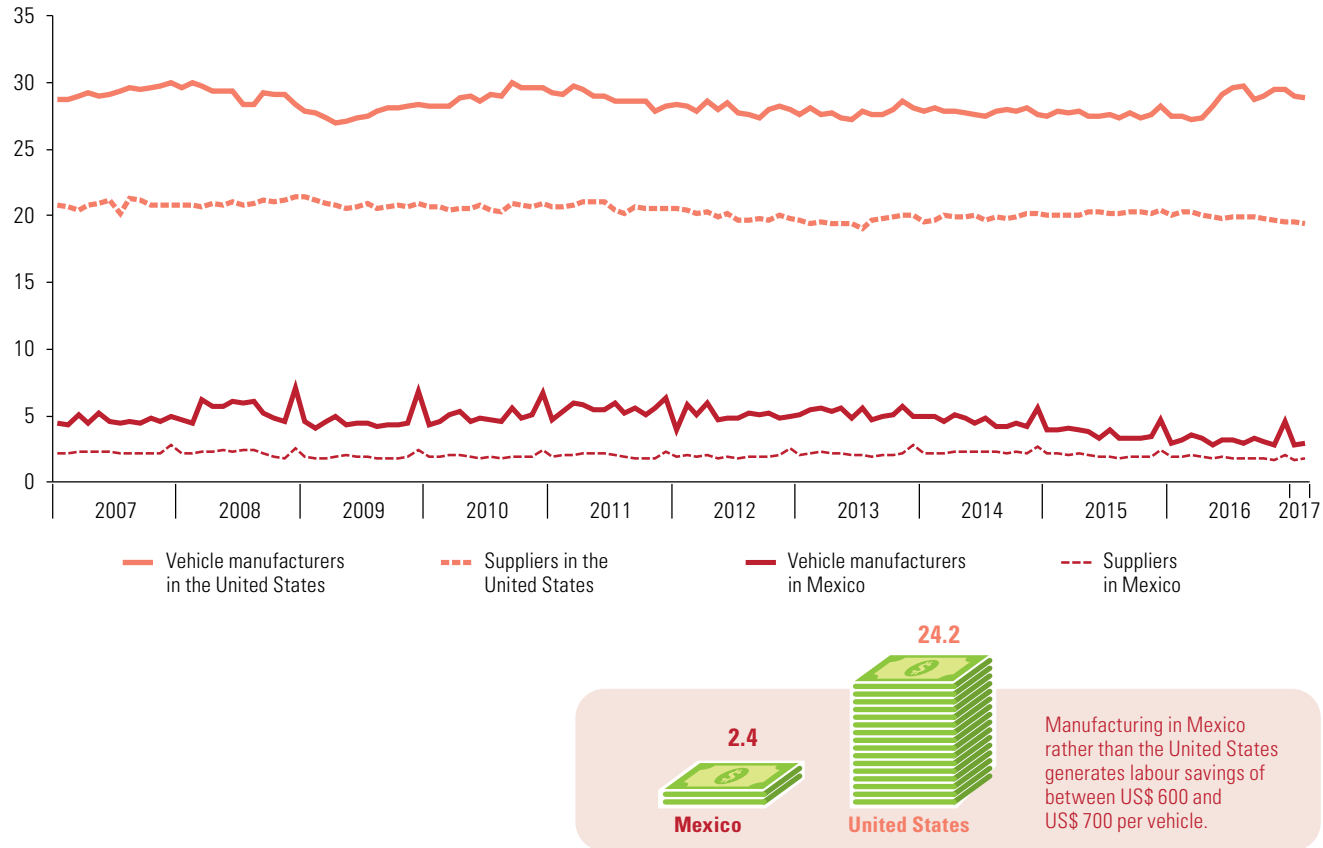
Despite its recent sound performance, the Mexican industry is not immune to global developments in the sector. First of all, although Mexico has been able to attract many of the global carmakers and a large number of first- and second-tier suppliers, it still lags behind in terms of third- and fourth-tier companies. This points to the weakness of the

local production structure, especially in relation to small and medium-sized high-tech, knowledge-intensive companies. This not only represents a lost opportunity to build local value added into automotive products; it also limits the spillover of indirect production and technology benefits to the rest of the local economy.

A second, related factor is the creation and optimization of local capabilities in human resources, science, technology, innovation and enterprise development. Mexico has made notable progress on these fronts, but not enough given the fast pace of the industry and of capacity-building in these areas in other parts of the world, especially China. A denser industrial fabric and more solid local capacities would lessen the risks to the Mexican automotive industry from the changes beginning to occur in the sector.

In addition, given the rapid pace of technological change in the motor vehicle industry, the advantages of Mexico's wage gap with respect to the United States and Canada (which is a major source of competitiveness for the country) will dissipate rapidly. Advances and falling costs in robotics could threaten jobs in the industry in the medium term, at least for some of the best paid workers (see figure 5).

Figure 5
United States and Mexico: average hourly wage for workers and unsupervised employees in the automotive industry, 2007-2017
(Dollars per hour)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from United States Department of Labor, Bureau of Labor Statistics, and National Institute of Statistics and Geography (INEGI) of Mexico.

Lastly, recent policy changes by the new Administration in the United States have been focused in particular on the foreign trade and industrial policy fronts. The economic platform of the new President's election campaign was presented as an alternative to the globalization agenda and included, among other items, the withdrawal of the United

States from the Trans-Pacific Partnership (TPP) and from NAFTA, tariffs of 45% on imports from Mexico, the reduction of the trade deficit and the reform of corporate tax legislation to stimulate the repatriation of companies, jobs and capital. These proposals were grouped under the collective slogan and policy of "American First", which is aimed at repositioning the United States as the main hub of global manufacturing, especially in the automotive industry.

The effects of the new trade and industrial policy discourse began to be felt immediately after the elections. In the first 10 weeks that elapsed between the elections and his taking office, the President-elect concentrated heavily on the automotive industry and concluded a number of agreements with United States manufacturers in the sector to withdraw planned investments in Mexico or commit to reshoring plants and jobs to the United States.

On the basis of these initial actions, once the new Administration took office in January 2017, the President signed executive orders on a broad range of issues, in order to create institutions, streamline regulatory process and authorizations and strengthen mechanisms for boosting manufacturing in the United States. The Administration also began to review environmental regulations affecting the motor vehicle industry, including Corporate Average Fuel Economy (CAFE) Standards, which the outgoing Administration had recently strengthened as part of efforts to combat climate change and drive the development of hybrid and electric vehicles.

After this first raft of reforms and deregulation, the Administration shifted its attention to NAFTA. Although it was initially thought that the United States would withdraw from the agreement, on 18 May 2017 the Administration asked Congress to approve the initiation of talks with Mexico and Canada after a 90-day period, with a view to updating NAFTA. The idea is apparently to modernize the agreement's provisions on intellectual property rights, regulatory practice, public enterprises, e-commerce, services, customs procedures, sanitary and phytosanitary measures, employment, the environment and small and medium-sized enterprises.

Both Mexico and Canada have given their support for updating NAFTA, which was adopted 23 years ago, and have indicated a desire to preserve the regional automotive production chains. Although the United States has afforded emphasis thus far to regulatory issues, the negotiations on tariffs and rules of origin will be crucial in reaching a new agreement. In this framework, any major changes to the existing trade preferences could significantly upset production and supplier chains in North America.

Although it is too soon to gauge the effect of these new policies —many of which have yet to be implemented— and the scope of the NAFTA negotiations is not fully clear, the alteration of automotive production chains would be highly damaging to jobs and competitiveness. In such a scenario, China could see its dominant role reinforced as a producer of parts, components and specialized machinery, given the sheer size and low costs of its motor vehicle industry.

Mexico's automotive industry is strongly positioned at this juncture of pressures from the technological revolution combined with the shifting focus of trade and industrial policies in the United States. However, this will not shield it from significant challenges to its stature as one of the largest global producers and exporters. Beyond the trade negotiations currently under way, Mexico will have to base its responses on new sectoral and technology policy efforts, framed by the current reality of the global automotive industry.

CHAPTER

I

Foreign direct investment in Latin America and the Caribbean

A. 2016: a turning point in globalization

The 12 months since the publication of *Foreign Direct Investment in Latin America and the Caribbean 2016* represent a turning point in the perception of globalization and its economic and social effects. Political events, such as the referendum in the United Kingdom which resulted in the vote to leave the European Union (Brexit) and the presidential election in the United States, reflect trends that developed over time in global production and trade. The difficulties of large middle-income sectors in developed countries resulted from years of slow growth, high unemployment —particularly among young people—, wage stagnation or deterioration and pressure from migratory flows of a magnitude not seen since the end of the 1940s.

These events were accompanied by widespread acknowledgment that the technological revolution has picked up pace and is now universal. Only a few years ago, terms such as robotics and artificial intelligence were associated with a distant reality, whereas they are now included in all forums and discussions on economic growth, employment and equality. The World Economic Forum's dissemination of the concept of the fourth industrial revolution has resulted in the technological dimension being incorporated into political concerns, or at least the political discourse.

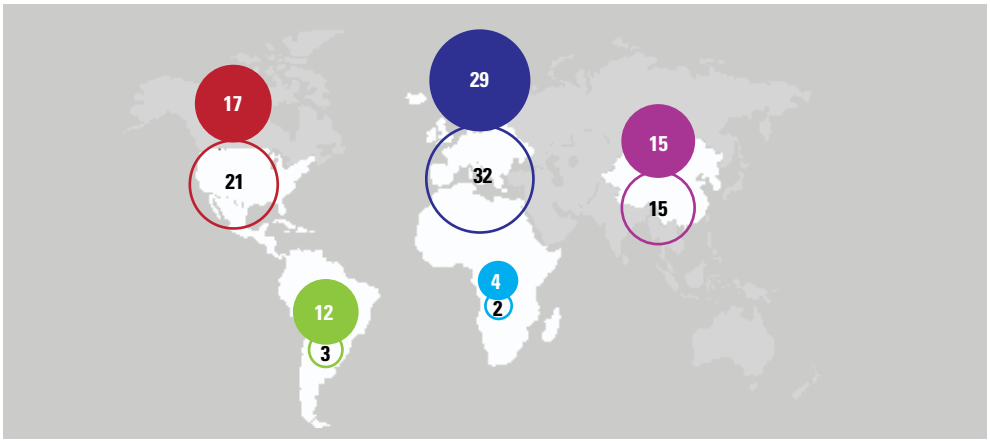
The combination of these political and economic factors has increased the pressure to relocate production to developed countries and set off a trend towards economic nationalism, which was unthinkable less than two years ago. China's productive, technological and geopolitical progress —as well as its consolidated position as the world's second-largest economy— has strengthened resistance to globalization, which was already reflected in weaker growth in global production chains, owing partly to increasing interest in the advantages deriving from the close proximity of production, research, development and innovation activities to one another. At the same time, although the growing weight of global digital platforms in goods and services production and consumption reduces barriers to entry to third markets and increases competition, national economies reflect various levels of openness in terms of production, trade and investment.

Against the backdrop of a rapid technological transition and greater interest in keeping production at home, growing competitive pressure is redirecting businesses towards more technology-intensive markets. Greater competition and pressure to innovate stimulate foreign investment in quality assets (patents and highly-skilled human resources) which are more abundant in the triad comprising the United States and the advanced regions of Western Europe and East Asia where products and production processes are manufactured and where standards are set and later disseminated. As shown in figure I.1, this triad combines manufacturing, technological research and development, and training of highly-skilled human resources in the world's 500 leading universities.

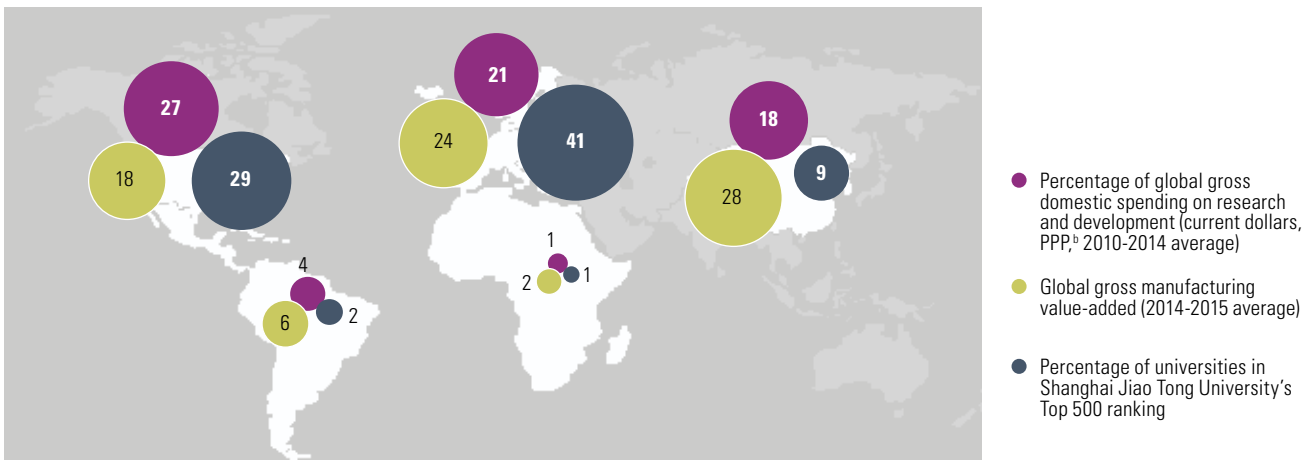
Against the backdrop of a rapid technological transition and greater interest in keeping production at home, growing competitive pressure is redirecting businesses towards more technology-intensive markets.

Figure I.1
Africa, Latin America and the Caribbean, China,[a] the United States and Europe: share of FDI flows and selected indicators of strategic assets
(Percentages)

A. FDI inflows and outflows, 2012-2016 average



B. Capacity and strategic assets



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, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva; United Nations Statistics Division; UNESCO Institute for Statistics (UIS) and Shanghai Jiao Tong University, Academic Ranking of World Universities (ARWU), 2015.

[a] Data cover China and Hong Kong Special Administrative Region of China.

[b] Purchasing power parity.

The economic recovery in the United States and the European Union, which is based more on monetary and supply policies than on demand policy, has reinforced these trends. The increase in explicit or inexplicit support mechanisms for advanced manufacturing and the spread of the fourth industrial revolution are reflected in programmes such as Germany's *Industrie 4.0*, China's *Made in China 202*5, and in the modernization and automation of the United States defence industry.

Although there are still good reasons to invest abroad, the relative weight of these investments is decreasing. The pursuit of natural resources continues to follow the boom-bust cycles of the past in response to global demand and the long-term nature of the investments. Investments that seek to take advantage of domestic markets continue to focus on the largest or most dynamic countries, while those seeking efficiency through export platforms have been hit the hardest by the new trends.

These conditions have slowed the momentum of foreign direct investment in Latin America and the Caribbean. Multiple editions of this report have highlighted the failure of transnational companies with subsidiaries in the region to prioritize the search for quality assets. Instead they have focused on domestic markets (in large and medium-sized countries), on the extraction or exploitation of natural resources (in countries specialized in agriculture, mining and tourism), or on building platforms for exports to the United States (in Mexico, Central America and the Caribbean).

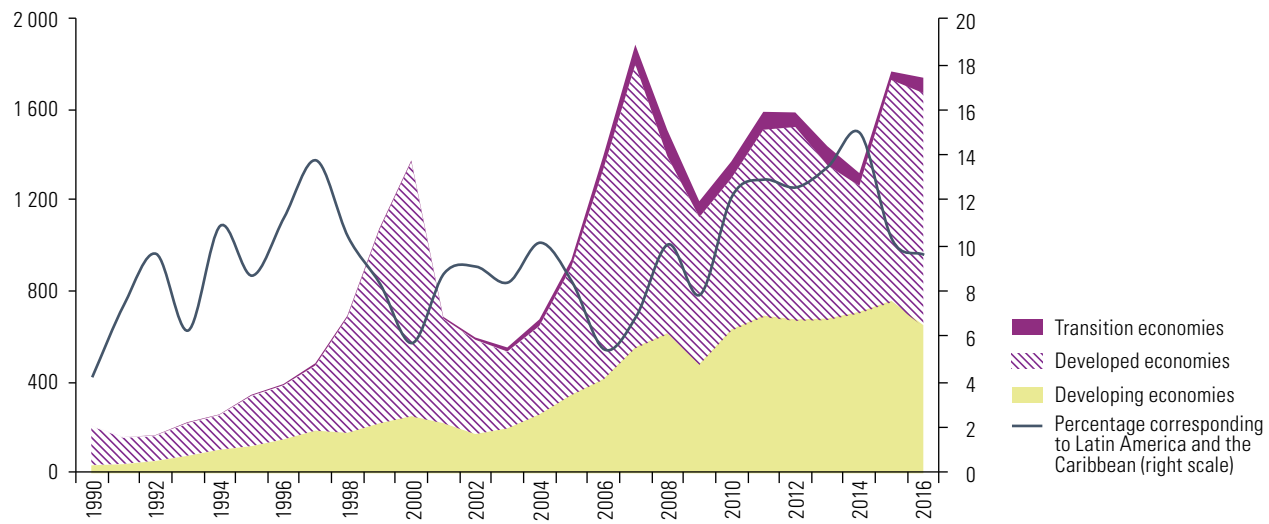
FDI strategies for the domestic market face slow growth in the region, after three years of stagnant or declining per capita GDP, down 3.6% between 2013 and 2016. Investment in natural resources softened following the end of the commodity price boom and, after overcoming the effects of the global crisis in 2009, the development of new export platforms looks highly uncertain environment in the light of the renegotiation of the North American Free Trade Agreement (NAFTA), the cancelation of the Trans-Pacific Partnership (TPP) and the possible shift from multilateral trade negotiations to a more bilateral stance driven by the United States.

Against this backdrop, FDI inflows into the region continue to fall, down 16.9% since the peak level seen in 2011.

B. Global FDI flows are returning to advanced economies

Global FDI flows amounted to US$ 1.7 trillion in 2016, higher than any of the annual performances between 2008 and 2014. Nonetheless, this figure reflects a 2% drop compared with 2015, owing mainly to the fact that inflows into developing countries fell by 14%, returning to 2010 levels. Meanwhile, inflows into developed countries climbed by 5% and those into transition economies by 81% after two years of sharp declines (see figure I.2)

Figure I.2
Global FDI flows by groups of economies, and proportion corresponding to Latin America and the Caribbean, 1990-2016
(Billions of dollars and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and United Nations Conference on Trade and Development (UNCTAD), World Investment Report, 2017: Investment and the Digital Economy (UNCTAD/WIR/2017), Geneva.

The percentage share of the different groups of economies varied considerably between 2014 and 2016. Developed economies regained their position as the largest FDI recipients, accounting for 59% of the global total (higher than the levels seen in 2008 and 2009), while FDI flows into developing countries fell from 53% in 2014 to 37% in 2016 (see table I.1).

Table I.1
Global FDI inflows, variation rate and distribution by region, 2007-2016

Region	Investment flows (billions of dollars)						Variation rate (percentages)					Distribution by region (percentages of global total)					
	2007-2011[a]	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016	2007-2011[a]	2012	2013	2014	2015	2016
Global total	**1 515**	**1 593**	**1 443**	**1 324**	**1 774**	**1 746**	**0**	**-9**	**-8**	**34**	**-2**	**100**	**100**	**100**	**100**	**100**	**100**
Developed economies	**846**	**857**	**684**	**563**	**984**	**1032**	**4**	**-20**	**-18**	**75**	**5**	**56**	**54**	**47**	**43**	**55**	**59**
European Union	464	492	337	257	484	566	13	-31	-24	89	17	31	31	23	19	27	32
United States	219	199	201	172	348	391	-13	1	-15	103	12	14	12	14	13	20	22
Transition economies	**82**	**65**	**84**	**57**	**38**	**68**	**-19**	**30**	**-33**	**-34**	**81**	**5**	**4**	**6**	**4**	**2**	**4**
Developing economies[b]	**587**	**671**	**675**	**704**	**752**	**646**	**-2**	**1**	**4**	**7**	**-14**	**39**	**42**	**47**	**53**	**42**	**37**
Latin America and the Caribbean[c]	151	201	196	199	183	167	-3	-3	2	-8	-8	10	13	14	15	10	10
Africa	65	78	75	71	61	59	17	-4	-4	-14	-3	4	5	5	5	3	3
Developing Asia	379	401	421	460	524	443	-6	5	9	14	-15	25	25	29	35	30	25

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures for Latin America and the Caribbean and United Nations Conference on Trade and Development (UNCTAD), *World Investment Report, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva.

[a] Simple average.

[b] Not equal to the total for the subregions as the figure for Latin America and the Caribbean is not taken from UNCTAD (2017).

[c] Calculation of the variation in 2016 excludes the Bolivarian Republic of Venezuela and Trinidad and Tobago because data for those countries are unavailable for 2016.

The percentage share of the different groups of economies varied considerably between 2014 and 2016. Developed economies regained their position as the largest FDI recipients, accounting for 59% of the global total.

FDI flows into North America climbed by 9%, including a record-high increase of 12% in the United States, while flows into European Union countries jumped by 17%, thanks to the United Kingdom, which saw investment surge from US$ 33 billion in 2015 to US$ 254 billion in 2016.[1] Although there are currently no signs of Brexit having a negative impact on FDI flows, just two acquisitions accounted for 67% of inflows, reflecting sectoral growth and transnational companies' consolidation strategies: the Belgian-based Anheuser-Busch Inbev SA/NV acquired the brewer SABMiller PLC for US$ 101.5 billion and Royal Dutch Shell bought the oil and gas company, BG Group PLC, for US$ 69.4 billion.

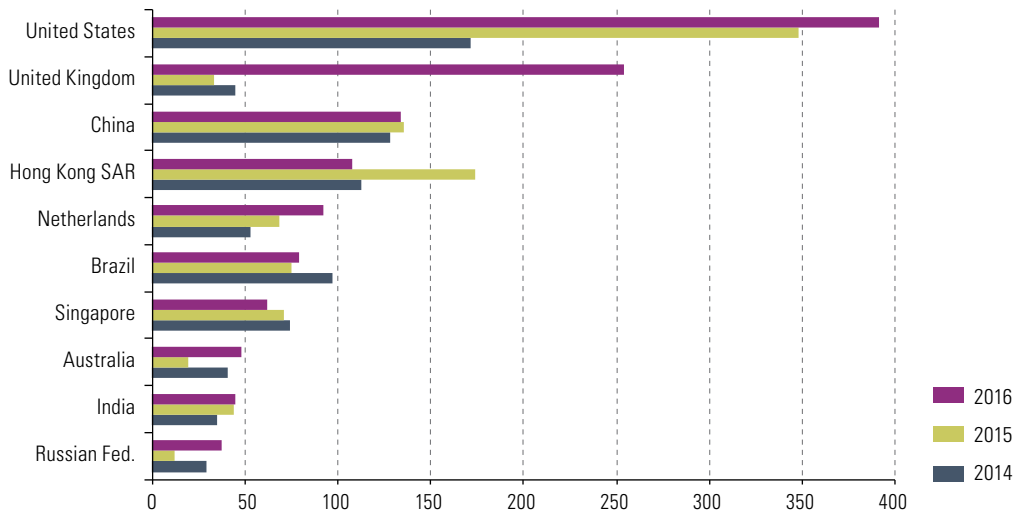
Among developing countries, FDI declined in Africa (3%) owing to weak mineral prices, and in Asia (15%) where flows towards China were relatively stable (down 1%) and investment in Hong Kong Special Administrative Region (SAR) of China fell sharply (18%). Average inflows dropped by 7.8% in Latin America, albeit with stark differences among countries and subregions, as will be seen below. With respect to transition economies, flows to the Russian Federation increased considerably, to almost US$ 38 billion. While this figure was much lower than the peak reached in 2008 (US$ 118 billion), it was also much higher than the level seen in 2015, reflecting an increase 217.7% following the privatization of State-owned oil and gas companies. These sectors also played a key role in the increase in FDI towards Kazakhstan.

[1] FDI flows into Europe were down by 6% in 2016, despite large mergers and acquisitions totalling US$ 337 billion, the highest level seen since 2007 in the European Union. If the United Kingdom is excluded, FDI inflows plunged 31% in 2016.

1. The United States and European Union are the main receiving countries

In 2016, the main recipients of FDI were the United States, the United Kingdom and China and Hong Kong SAR. This, together with the considerable weight of mergers and acquisitions in investment flows, is line with the aforementioned search for high-quality strategic assets, and consolidates the triad of regions as the top FDI recipients (see figure I.3). With regard to FDI trends, flows to Hong Kong SAR declined, while those towards Australia and the Russian Federation increased.[2]

Figure I.3
Ten leading host economies of FDI, 2014-2016
(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, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva and official figures.

Cross-border mergers and acquisitions accounted for a large share of investment in 2016 and rose by 18% compared with the previous year, to a net total of US$ 869 billion (49.7% of FDI inflows). This confirmed the upward trend in these transactions, driven by high global liquidity. At the same time, the relative weakness of the euro against the dollar led to more mergers and acquisitions in the European Union (up 36.7% in 2016), underpinned by sectoral growth that facilitated large deals. In the past, such transactions have tended to be carried out in the developed economies, and this trend regained momentum in 2016, with 91% of all transactions taking place in developed economies in 2016 up from 75% in 2010 (see table I.2).[3]

2 In Australia, the largest investments targeted the services sector: information management, insurance and credit services.

3 The value of net mergers and acquisitions increased by 24.2% in developed countries, while it fell by 17.8% in developing economies. In the European Union and United States, their value grew by 36.7% and 18.7%, respectively, but fell by 19.7% in Asia. In Latin America, transaction values were up by 62.2%, although this was still below the levels reached in 2010 and 2014, and accounted for less than 2% of the global total in 2016.

Table I.2
Value of net cross-border mergers and acquisitions and share by region or economy of the seller, 2010-2016
(Billions of dollars and percentages)

	Amount			Share			Variation
	2010	2015	2016	2010	2015	2016	2016
World	**347 094**	**735 126**	**868 647**	**100**	**100**	**100**	**18**
Developed economies	**259 926**	**640 762**	**794 317**	**75**	**87**	**91**	**24**
Transition economies	118 187	265 256	362 593	34	36	42	37
United States	84 344	303 981	360 797	24	41	42	19
Japan	7 114	3 065	20 088	2	0	2	555
Transition economies	**4 095**	**10 000**	**5 014**	**1**	**1**	**1**	**-50**
Transition economies	**83 072**	**84 364**	**69 315**	**24**	**11**	**8**	**-18**
Latin America and the Caribbean	29 013	10 952	17 762	8	1	2	62
Africa	7 493	21 259	9 689	2	3	1	-54
Developing Asia	37 723	49 919	41 861	11	7	5	-16
China and Hong Kong SAR	19 443	13 626	12 436	6	2	1	-9

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, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva.

With regard to the origin of mergers and acquisitions, that is, the country where the transnational company acquiring the assets is based, developed countries accounted for 20% more of these transactions in 2016, with 45% more originating in the European Union and 39% fewer in the United States (see table I.3). Developing economies also saw an increase (14%), mainly as a result of Chinese companies' acquisitions: up 80% in 2016 compared with 2015, to a record high of US$ 92.221 billion. If Chinese companies' acquisitions are excluded, mergers and acquisitions originating in developing countries fell for the second year in a row (28% in 2016 and 31% in 2015). This pattern is linked to the new role of Chinese firms as international investors, which began developing in 2000 with the Go Global strategy, introduced in the President's report to the National People's Congress (ECLAC, 2011), and which will affect not just FDI in the coming years, but also the global economic growth.

Table I.3
Value of net cross-border mergers and acquisitions and share by region or economy of the purchaser, 2010-2016
(Billions of dollars and percentages)

	Amount			Share			Variation
	2010	2015	2016	2010	2015	2016	2016
World	**347 094**	**735 126**	**868 647**	**100**	**100**	**100**	**18**
Developed economies	**224 759**	**587 455**	**707 528**	**65**	**80**	**81**	**20**
European Union	23 108	270 224	391 042	7	37	45	45
United States	85 104	127 879	77 949	25	17	9	-39
Japan	31 271	50 623	80 646	9	7	9	59
Transition economies	**5 378**	**4 501**	**-0.809**	**2**	**1**	**0**	**-118**
Developing economies	**100 378**	**131 153**	**149 857**	**29**	**18**	**17**	**14**
Latin America and the Caribbean	16 725	4 953	0.686	5	1	0	-86
Africa	3 792	3 533	6 061	1	0	1	72
Developing Asia	79 865	122 609	143 235	23	17	16	17
China	29 828	51 117	92 221	9	7	11	80
Hong Kong SAR	13 318	19 598	0.089	4	3	0	-100

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, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva.

The number of greenfield investment projects, which fell sharply after the global financial crisis, increased for the second year in a row in 2016 (7%) (see figure I.4). Unlike mergers and acquisitions, developing economies were the top host countries for new projects (62% of the total in 2016). This improvement, together with expectations of stronger economic growth in several regions, points to a modest recovery in global FDI in 2017 (UNCTAD, 2017)

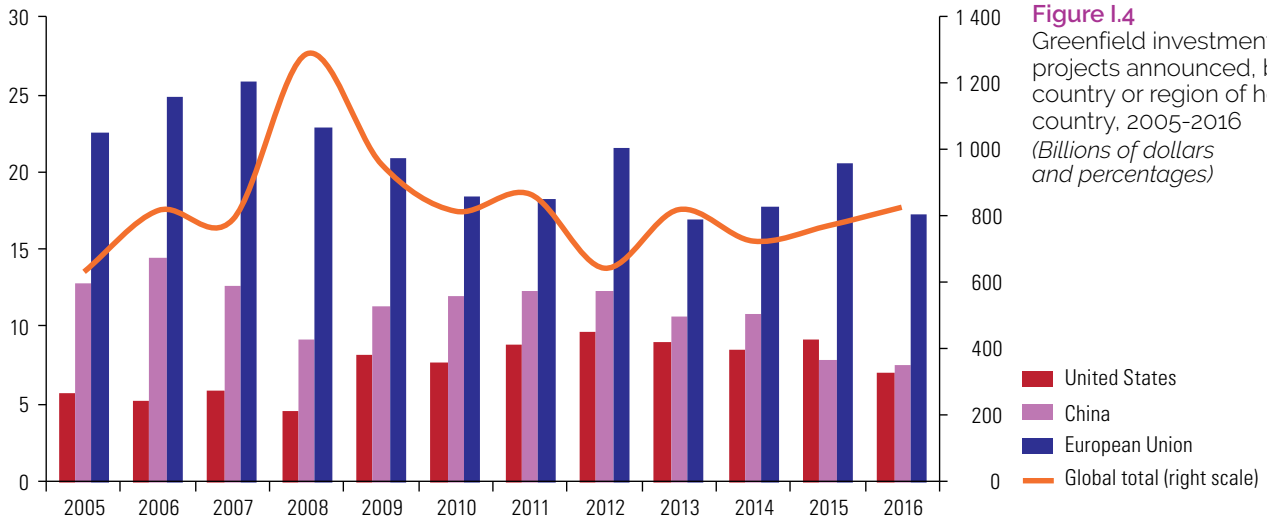


Figure I.4
Greenfield investment projects announced, by country or region of host country, 2005-2016
(Billions of dollars and percentages)

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

2. China's growing influence is consolidating the globalization triad

China's investments abroad set a new record of US$ 183.1 billion in 2016, an increase of 43.5% over the previous year. And, for the first time, FDI outflows exceeded inflows (see figure I.5).

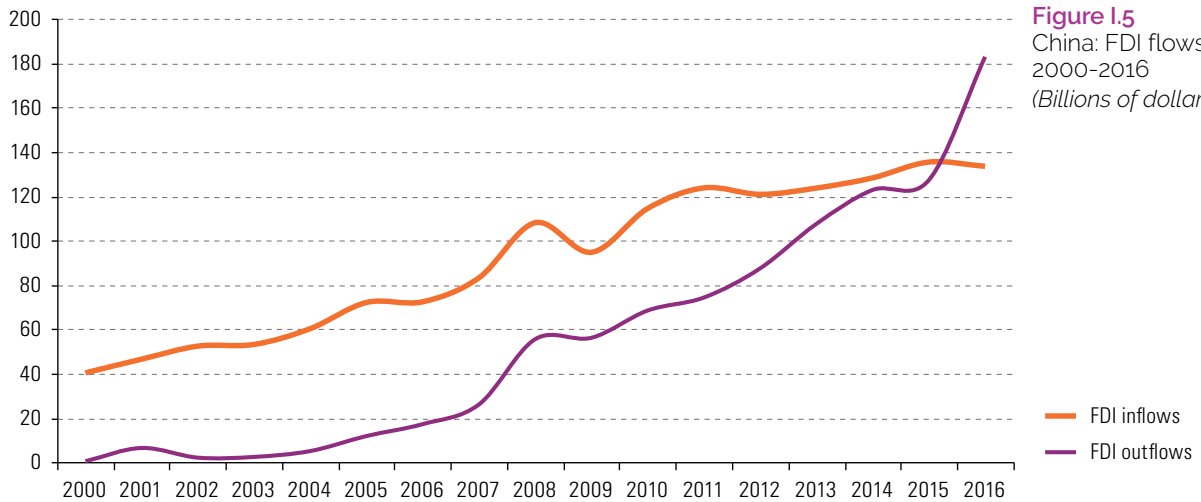
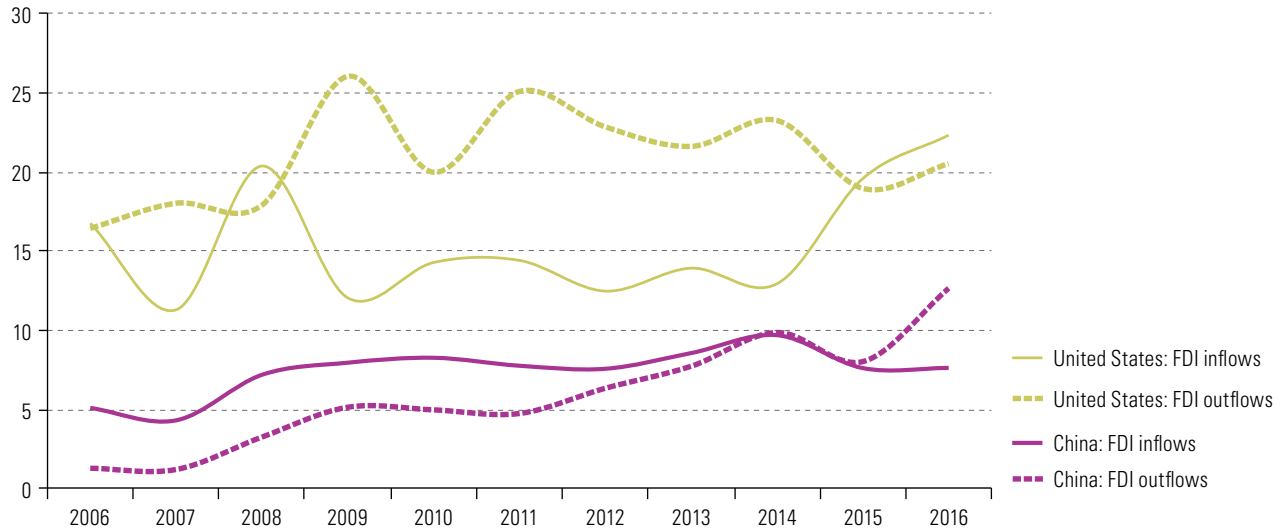


Figure I.5
China: FDI flows, 2000-2016
(Billions of dollars)

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, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva.

FDI inflows into China have increased considerably over the past decade, representing almost 10% of global flows in 2014. However, the country's share of the global total has declined in the past two years, while the relative and absolute importance of Chinese transnational companies' investments abroad continues to grow. In 2006, they accounted for barely 1.3% of global FDI flows, compared with 16.5% for the United States (the largest investor), yet in 2016 they accounted for 12.6%, placing China second behind the United States (20.6%) (see figure I.6).

Figure I.6
United States and China: share of global FDI inflows and outflows, 2006-2016
(Percentages)



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, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva.

By 2016, China's share of global FDI flows had risen to 12.6%, making it the world's second largest investor after the United States.

China is thus strengthening its position in the global economy as a major market for commodities and manufactured goods from developed and developing countries, and as a global player which, through its transnational companies, is successfully integrating into increasingly sophisticated sectors and actively participating in the new technology trends of the fourth industrial revolution.

While China's domestic market remains highly attractive for both developing and developed economies, for several years now the initiatives taken by the country's major companies have been changing the global geography of production in many sectors.

ECLAC has conducted an analysis of some mining products whose global value chains have been significantly altered by Chinese companies' strategies. Over the past 15 years, these firms have stepped up mineral extraction and increased demand for minerals on the global market, driving the boom in metal prices. At the same time they have invested in metal refining and smelting, and moved up the mining and metallurgy value chain. These companies have thus taken on a central role in iron, steel and aluminium manufacture, overtaking countries such as Germany, Japan, the Russian Federation and the United States, and providing serious competition for the Latin American industry (ECLAC, 2016a). Although this is part of China's industrialization project, there are signs that much more sophisticated products could start to follow a similar path.

It is inevitable that the weight of many Chinese firms in the global economy will continue to increase, given their size. According to *The Economist* (2017), the increase in FDI from China and in the mergers and acquisitions carried out by Chinese firms is not merely part of an industrialization strategy. In fact, mergers and acquisitions by Chinese transnational corporations target a wide variety of sectors, from football clubs to hotel chains, making it difficult to detect the industrial logic behind many of these deals.

The increasing size of many Chinese firms, the availability of cheap loans from State-owned banks and the difficulty of maintaining high profits solely in the domestic market explain in large part the growth in investment flows from China. However, the most recent mergers and acquisitions by Chinese transnational corporations present a more complex picture.

Although China's investment in the United States and Europe has been growing since 2011, it shot up by 130% in 2016, from US$ 41 billion in 2015 to US$ 94 billion, accounting for some 51% of total FDI outflows from that country.[4] The total amount would have been even higher if antitrust authorities in the United States and the European Union had not blocked the acquisition of Syngenta,[5] a Swiss agrochemical and seed company, by ChemChina, in 2016. The deal, worth US$ 44 billion, was later approved in June 2017.

Most of the flows from China to these two regions took the form of mergers and acquisitions, an important tool that allows purchasing companies to acquire knowledge, technological capacity, brands, a client base and market access quickly, sparing them the otherwise lengthy and difficult process they would have to undertake to develop their own.

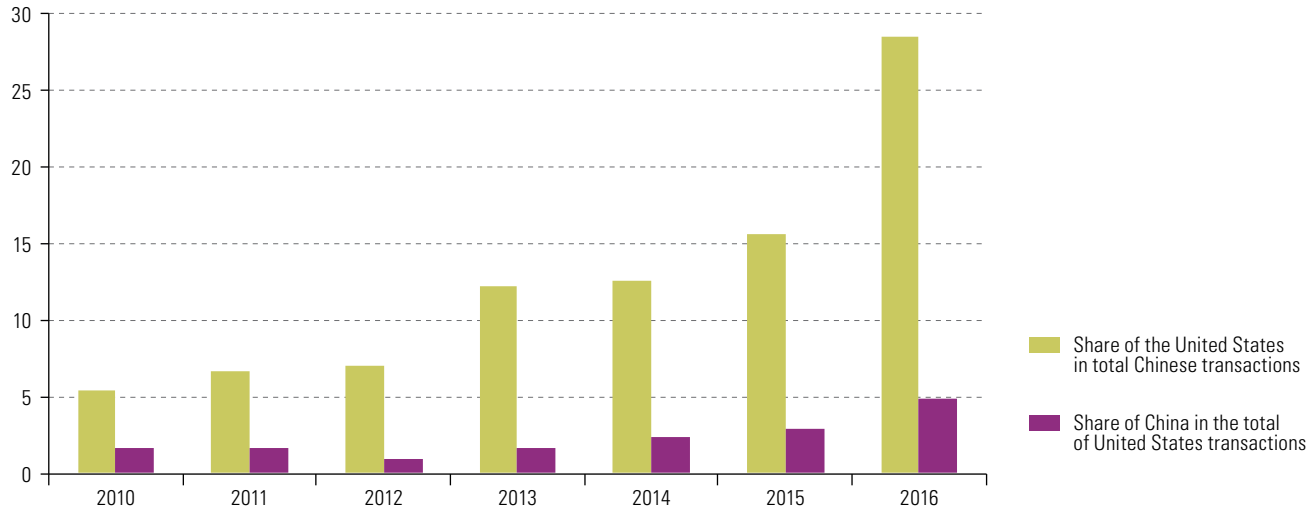
Chinese firms' interest in the United States has grown in the past five years. Figure I.7 shows the relative weight of the United States as a host country for mergers and acquisitions by Chinese companies, and vice versa. Between 2010 and 2016, the share of United States companies in the total acquisitions by Chinese firms rose from 5.4% to 28.6%. At the same time, Chinese corporations accounted for just 4.9% of United States companies' acquisitions.

Chinese firms made major acquisitions in the hardware, consumer electronics, real estate and entertainment sectors in the United States in 2016. In hardware, Apex Technology bought the printer company Lexmark International for US$ 3.6 billion and, in consumer electronics, Haier acquired the household appliance company GE Appliances (one of the largest United States brands in history) for US$ 5.6 billion.

Major deals were also closed in the hotel sector: Anbang Insurance Group (a Chinese financial services firm) acquired the luxury hotel chain Strategic Hotels & Resorts for US$ 5.5 billion; HNA Group, a multi-sector conglomerate (aviation, real estate, tourism, logistics and financial services) acquired Carlson Hotels Inc for an estimated US$ 2 billion; and China Life Insurance Company Limited bought a stake in Starwood Capital Group for US$ 2 billion. Meanwhile in the entertainment sector, Wanda Group, owner of the world's largest cinema chain (including Wanda Cinemas and Hoyts Group) acquired Legendary Entertainment, a film production company, for US$ 3.5 billion (Baker McKenzie, 2017).

4 Before 2008, both regions received less than US$ 1 billion in investment from China (Baker McKenzie, 2017).
5 Syngenta is one of the world leaders in this market and, in 2015, had rejected an acquisition bid from Monsanto.

Figure I.7
Relative weight of acquisitions by China in the United States and by the United States in China, 2010-2016
(Percentages)



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

Chinese investments in Europe focused on information and communications technologies (ICTs), and totalled US$ 13.7 billion, followed by transport, energy and infrastructure, totalling US$ 12.2 billion, and industrial equipment, amounting to US$ 6.2 billion (Baker McKenzie, 2017). Some of the largest deals include the purchases of Supercell, a Finnish company specializing in mobile game development, by Tencent Holdings Limited —which offers Internet and mobile phone services ranging from e-commerce to interactive entertainment— for US$ 7.8 billion; Skyscanner, a travel website and search engine, by Ctrip, the largest Chinese travel company, for US$ 1.7 billion; and Global Switch, a British company specializing in operating and developing large scale data centres, by a consortium of Chinese investors.

In the industrial equipment sector, the Chinese transnational Midea Group, which manufactures electrical appliances, acquired KUKA AG, one of the world's leading manufacturers of industrial robots and factory automation systems for US$ 4.7 billion, while ChemChina acquired KraussMaffei, which manufactures industrial equipment and automated production systems, for US$ 1 billion. Both acquisition targets were high-tech German firms.

Various Chinese transnational companies have also invested in the air transport and energy sectors: HNA Group bought Avolon, an Irish aircraft leasing company, for US$ 2.5 billion, and Swissport International, for US$ 2.8 billion; and Beijing Enterprise acquired EEW Energy, a German company that produces energy from waste, for US$ 1.6 billion.

Several of these deals, particularly in the United States, reflect the diversity of targeted sectors and the finance background of acquiring firms. A large number of investments do not aim to upgrade technology or to build capacity in strategic sectors for industrial development. Instead, they focus on maintaining high profitability, facilitated by high global liquidity and easy access to public credit.

This growing trend looks set to continue, although probably not to the extent seen over the past two years, owing to tighter controls by the Chinese monetary authorities because of the negative impact of FDI outflows on the balance of payments and pressure on the national currency (Hanemann and Huotari, 2017) and to concerns about the high debt levels of some Chinese transnational firms. Although the Chinese authorities have not tweaked regulations on investments abroad, which have been loosened considerably in recent years, administrative checks have increased since 2016. This change may curb transactions that do not follow the industrial development logic, particularly those carried out by investment funds.

At the same time, efforts to acquire strategic industrial assets that would allow China to integrate into the new global industrial and technological landscape have raised concerns in Europe and the United States (Hanemann and Huotari, 2017). One example of this is the decision by the German and United States Governments in 2016 to block the acquisition of Aixtron (a German semiconductor equipment maker with assets in the United States) by Grand Chip, a Chinese investment company, citing national security risks, as the components produced could be used in the military electronics industry.

The new United States administration has clearly expressed its concern about the lack of restrictions on foreign investment in strategic sectors and technologies, particularly the semiconductor industry, where the United States is the world leader and China is the largest consumer and competitor (Skadden, 2017).

In short, while some factors are curbing FDI outflows from China, others are driving the continued international expansion of its major companies. The size of many Chinese firms, the country's level of technological progress and industrial development, and the need to promote and strengthen its economic development are factors that will increasingly have an impact on many global sectors and on the global economy as a whole.

Efforts to acquire strategic industrial assets that would allow China to integrate into the new global industrial and technological landscape have raised concerns in Europe and the United States.

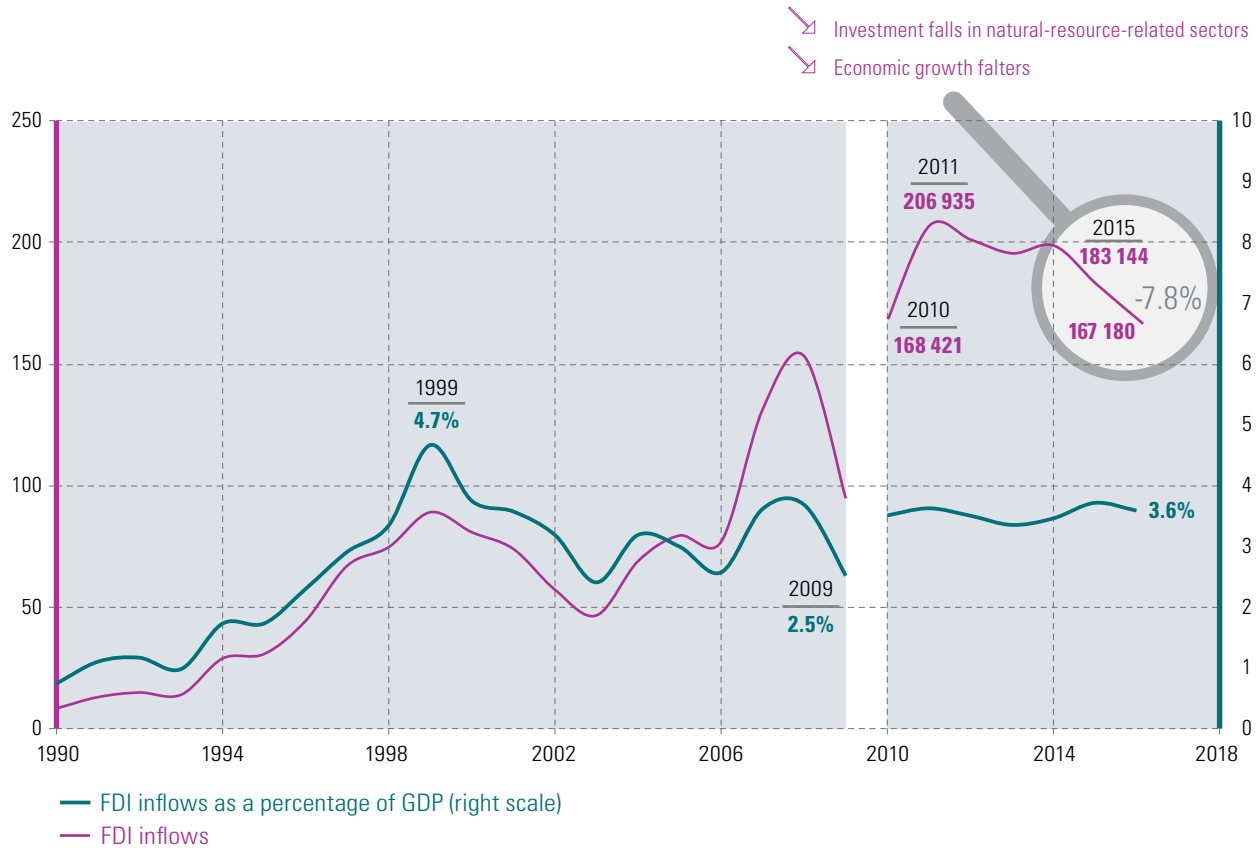
C. The region's complex scenario

1. FDI fell by 7.8% in Latin America and the Caribbean in 2016

FDI flows into Latin America and the Caribbean declined by 7.8% to US$ 167.180 billion in 2016. This was just below the level seen in 2010 and 16.9% lower than the peak reached in 2011 (see figure I.8). This outcome derived from weaker investment in natural resources, particularly metal mining, and slow economic growth in the region.

The largest economies are the most attractive targets for transnational companies. In 2016, Brazil was still the biggest recipient of FDI in the region (47% of the total), followed by Mexico (19%), Colombia (8%) and Chile (7%) (see table I.4). Performances were mixed from one country to the next and FDI fluctuated considerably year-on-year, as large transactions in a given year can cause flows to vary dramatically in the short-term, without this setting a trend.

Figure I.8
Latin America and the Caribbean: FDI inflows, 1990-2016
(Billions of dollars and percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.
Note: FDI figures do not include flows to the main financial centres of the Caribbean. FDI figures indicate FDI inflows, minus disinvestments (repatriation of capital) by foreign investors. These figures differ from those used in the 2017 editions of the *Economic Survey of Latin America and the Caribbean* and the *Preliminary Overview of the Economies of Latin America and the Caribbean*, because they show the net balance of foreign investment, that is, direct investment in the reporting economy (FDI) minus outward FDI. The figure for 2016 does not include the Bolivarian Republic of Venezuela or Trinidad and Tobago as no information was available for those countries, which were therefore excluded from the calculation of the variations. Since 2010, figures for Brazil include reinvested earnings from FDI; as a result, these figures are not directly comparable with those from before 2010. This is represented by the break in the lines.

At the subregional level, FDI in South America fell by 9.3%, while flows into Central America and the Caribbean rose by 4.9% and 3.3%, respectively. Within South America, Colombia posted the biggest increase in inflows (15.9%) and investment in Brazil climbed 5.7%. The largest declines in FDI were seen in Argentina (64.0%), Ecuador (43.7%) and Chile (40.3%). Investment in Mexico dropped by 7.9%, although it remained high compared with the levels seen in the past decade. Central America received a larger share of FDI, jumping from 3.7% of the total in 2010 to 7.2% in 2016. In this subregion, investment in Panama was at an all-time high, up 15.9% to US$ 5.209 billion. In the Caribbean, inflows to the Dominican Republic grew by 9.2%, totalling US$ 2.407 billion.

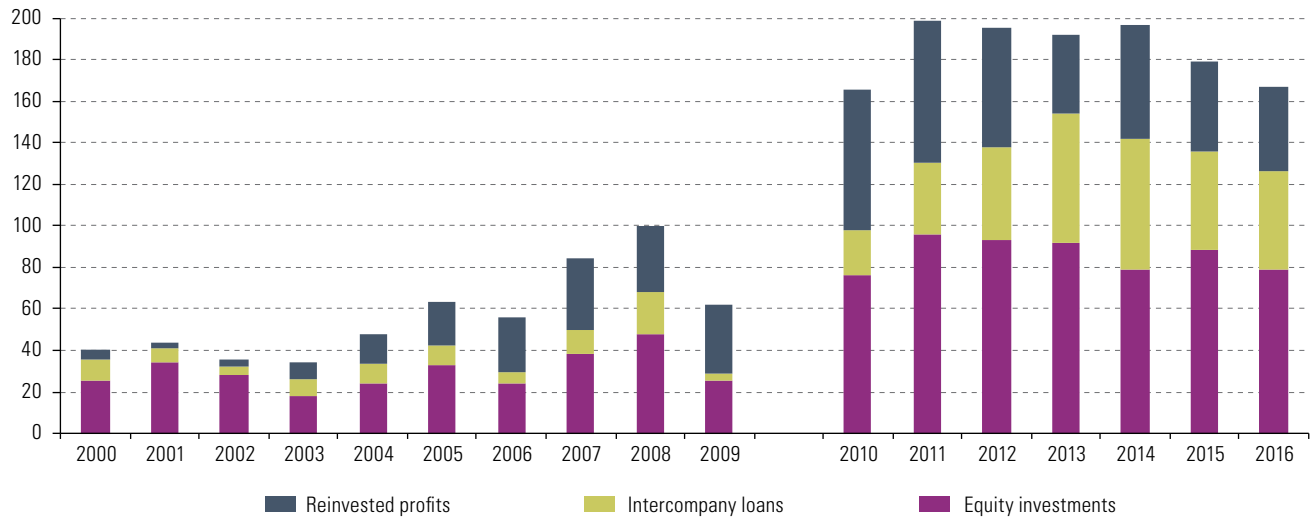
Table I.4
Latin America and the Caribbean: FDI inflows by recipient country and by subregion, 2005-2016
(Millions of dollars and percentage variation)

Subregion and Country	2005-2009[a]	2010	2011	2012	2013	2014	2015	2016	Absolute variation 2016-2015 *(millions of dollars)*	Relative variation 2016-2015 *(percentages)*
South America[b]	**68 400**	**135 957**	**168 689**	**170 153**	**134 545**	**150 895**	**131 724**	**118 219**	**-12 122**	**-9.3**
Argentina	6 204	11 333	10 840	15 324	9 822	5 065	11 759	4 229	-7 530	-64.0
Bolivia (Plur. State of)	259	643	859	1 060	1 750	657	555	410	-145	-26.1
Brazil	32 331	88 452	101 158	86 607	69 181	96 895	74 694	78 929	4 235	5.7
Chile	12 268	16 153	24 374	30 562	21 092	24 011	20 469	12 225	-8 243	-40.3
Colombia	8 894	6 430	14 648	15 039	16 209	16 163	11 732	13 593	1 860	15.9
Ecuador	465	166	644	568	727	772	1 322	744	-578	-43.7
Paraguay	137	462	581	697	252	382	260	274	13	5.1
Peru	4 978	8 455	7 341	11 788	9 800	4 441	8 272	6 863	-1 409	-17.0
Uruguay	1 461	2 289	2 504	2 536	3 032	2 188	1 279	953	-326	-25.5
Venezuela (Bol. Rep. of)[c]	1 403	1 574	5 740	5 973	2 680	320	1 383	...		
Mexico	**26 276**	**21 035**	**23 792**	**17 101**	**46 597**	**29 296**	**34 878**	**32 113**	**-2 766**	**-7.9**
Central America	**5 815**	**6 309**	**9 061**	**9 230**	**10 495**	**11 655**	**11 412**	**11 971**	**559**	**4.9**
Costa Rica	1 584	1 907	2 733	2 696	3 205	3 195	3 145	3 180	35	1.1
El Salvador	662	-226	218	484	176	311	399	374	-25	-6.2
Guatemala	640	806	1 026	1 245	1 295	1 389	1 221	1 181	-40	-3.3
Honduras	742	969	1 014	1 059	1 060	1 417	1 204	1 139	-64	-5.3
Nicaragua	394	490	936	768	816	884	950	888	-62	-6.5
Panama	1 792	2 363	3 132	2 980	3 943	4 459	4 494	5 209	715	15.9
The Caribbean[b]	**6 598**	**5 121**	**5 393**	**4 635**	**3 880**	**6 843**	**5 129**	**4 878**	**155**	**3.3**
Antigua and Barbuda	237	101	68	138	101	155	154	146	-8	-5.2
Bahamas	1 265	1 097	1 409	1 034	1 133	1 599	408	522	113	27.8
Barbados	416	446	458	548	56	559	69	228	159	228.5
Belize	131	97	95	189	95	153	65	33	-32	-49.7
Dominica	45	43	35	59	25	35	36	33	-2	-6.9
Dominican Republic	1 782	2 024	2 277	3 142	1 991	2 209	2 205	2 407	202	9.2
Grenada	117	64	45	34	114	38	61	63	3	4.6
Guyana	135	198	247	294	214	255	122	58	-64	-52.3
Haiti	69	178	119	156	161	99	106	105	-1	-0.7
Jamaica	882	228	218	413	545	582	925	790	-135	-14.5
Saint Kitts and Nevis	136	119	112	110	139	120	78	69	-9	-11.7
Saint Lucia	183	127	100	78	95	93	95	97	2	2.2
Saint Vincent and the Grenadines	108	97	86	115	160	110	121	104	-17	-14.0
Suriname	-141	-248	70	174	188	164	279	222	-57	-20.4
Trinidad and Tobago	1 232	549	55	-1 849	-1 134	672	406	...		
Total[b]	**107 088**	**168 421**	**206 935**	**201 118**	**195 518**	**198 687**	**183 144**	**167 180**	**-14 175**	**-7.8**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.
Note: Information based on the *Balance of Payments and International Investment Position Manual Sixth Edition* (BPM6) of the International Monetary Fund (IMF, 2009), except for Argentina, the Bahamas, Barbados, Belize, Ecuador, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, the Plurinational State of Bolivia, Suriname and Uruguay.
[a] Simple averages. Due to methodological changes, data prior to 2010 are not directly comparable with data for 2010 and after.
[b] The total and regional subtotal variations were calculated on the basis of annual data for all the countries except the Bolivarian Republic of Venezuela and Trinidad and Tobago.
[c] Data for the first three quarters of 2015.

With respect to FDI components, capital contributions posted the largest decline (10%), followed by reinvested earnings (6%). This suggests a defensive wait-and-see stance by transnational companies operating in the region in the light of less attractive prices for natural resources and the contraction of several countries' domestic markets. At the same time, these patterns could be the result of the collapse in asset profitability, which was strongest during the boom in prices for metals and other commodities. Reinvested earnings decreased for the second year in a row, to US$ 40.807 billion in 2016, equivalent to just 59.2% of the level seen in 2011, when the region's FDI inflows were at an all-time high (see figure I.9).

Figure I.9
Latin America and the Caribbean: FDI inflows by component, 2000-2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.
Note: Data before and after 2010 and as of that year onward are not directly comparable, because they refer to a different selection of countries. In both cases, the data exclude Bolivarian Republic of Venezuela, Suriname and Trinidad and Tobago; before 2010, they also exclude Brazil.

2. Rising star: non-conventional energy

With the boom in commodity prices now over, capital flows to natural resource extraction in Latin America and the Caribbean have slowed. This is reflected in the sectoral make-up of FDI inflows. The natural resources sector's share of FDI declined from 2010 onwards and fell from 18% of the total in 2010-2015 to 13% in 2016,[6] while the weight of manufacturing and services rose to 40% and 47%, respectively, of the total.

The sectoral structural changes were greater in countries where extractive industries have traditionally attracted foreign capital. In Colombia for example, FDI in natural resources plunged from 48% of the total in 2010-2015 to 17% in 2016 (see figure I.10). The share of natural resources in FDI in Brazil peaked at 31% in 2010 and subsequently declined sharply to 16% in 2016. In Mexico, natural resources accounted for just 5% of FDI in 2016, while manufacturing saw its share increase to 61%. The long-term growth

[6] Not all countries in the region publish FDI statistics disaggregated by sector.

in FDI in manufacturing, mainly in Brazil and Mexico, is linked to the development of the automobile industry and technological disruption in the sector (which is analysed in chapters II and III of this document). Meanwhile, in Colombia and in Central America and the Dominican Republic, services now account for the lion's share of FDI, standing at 69% and 65%, respectively.

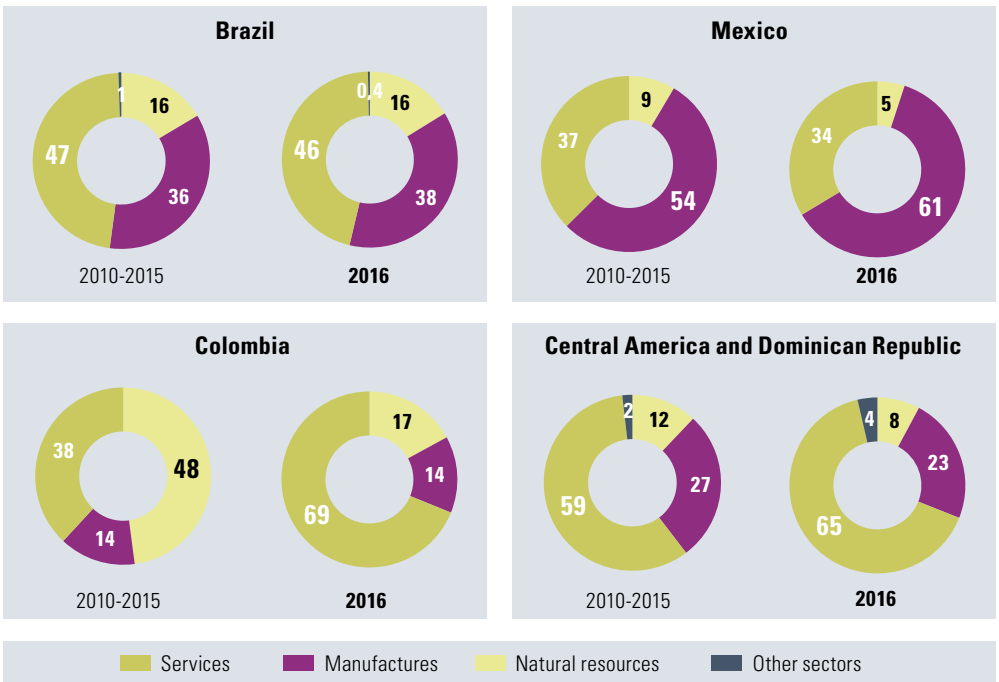


Figure I.10
Latin America (selected subregions and countries):[a] distribution of FDI by sector, 2010-2016
(Percentages)

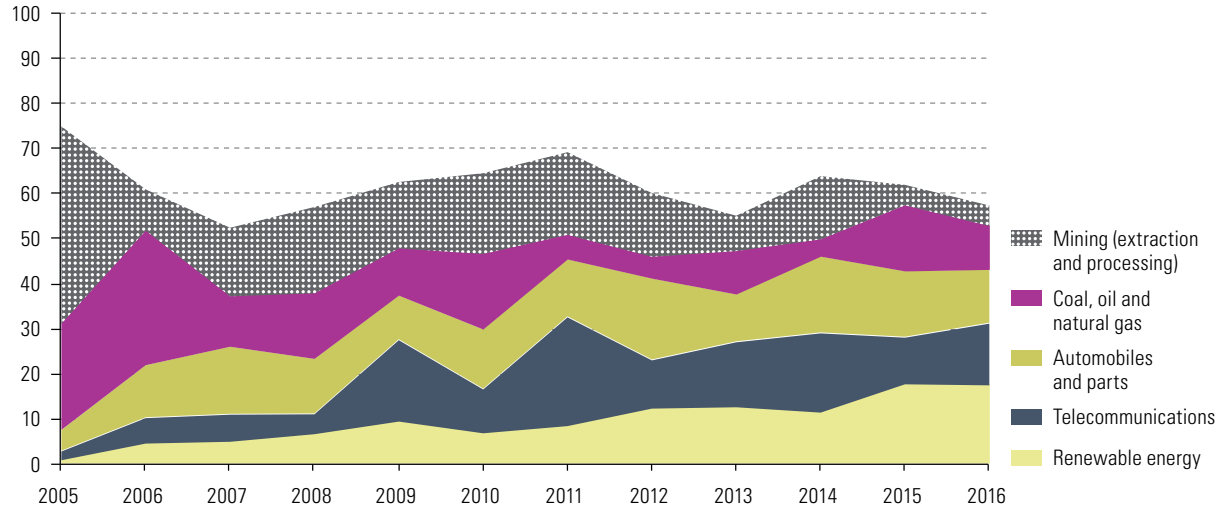
Source: Economic Commission for Latin America and the Caribbean, on the basis of official figures and estimates as of 15 June 2017.
[a] Figures for Central America do not include Costa Rica or Panama, because data for 2016 are not available.

The services category covers a range of economic activities and the weight of FDI in each subsector varies from one country to another and from one year to the next, as transactions often require large investments in infrastructure or electricity, for example. In spite of this, four areas stand out as the largest recipients: financial services; trade; electricity, gas and water services; and telecommunications.

Given the limitations in coverage and detail of national FDI statistics disaggregated by economic activity, the present analysis is supplemented with information compiled by the Financial Times publication, *fDi Markets*, (see figure I.11).[7] The sectoral make-up of announced investment projects changed following the end of the commodity boom, when the number of projects announced in extractive industries began falling steadily and was offset by the increase in investments announced in other sectors, mainly renewable energy, telecommunications and the automobile industry, in which the region received 17%, 21% and 20% of world overall investment, respectively.

[7] This base includes the figures announced for greenfield investments, which are not strictly comparable with FDI inflow statistics, as they refer to investment plans which may materialize over a long period of time, including several years after the announcement, and for which the final amount invested may differ from what had been previously announced. Meanwhile, FDI statistics correspond to foreign exchange inflows used to finance transnational companies' activities over a period of one year in a recipient economy. Announced project information reveals the medium- and long-term strategies of transnational firms broken down by sector.

Figure I.11
Latin America and the Caribbean: distribution of announced FDI projects by sector, 2005-2016
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, *fDi Markets*.
Note: This analysis excludes the 2013 announcement of the Nicaragua Canal, for a value of US$ 40 billion.

The data presented in the figure I.11 reveal the following general trends:

- Announced greenfield investments in the extractive industry dropped from an average of 38% of the total for the period 2005-2010, to 14% in 2016. In both 2015 and 2016, the amounts announced were the lowest of the last 10 years, which is consistent with the strategy of focusing on key assets and halting new investments by transnational companies in that sector.
- Renewable energy project announcements have increased steadily over the past decade. This sector attracted the most greenfield investment in 2016, with its share of the total climbing from an average of 6% for 2005-2010 to 18% in 2016, making it the fastest-growing sector in that period.
- The telecommunications sector accounted for 14% of the announced total in 2016, making it the second-largest recipient of investments announced in the region. Infrastructure development, the speed of technological change and strong competition forced operators, mainly transnational companies, to invest in order to remain competitive.
- Global digital platforms have also invested in the region, mainly in data centres that provide cloud services and related activities. The 16 projects announced would require an investment in the order of US$ 2.7 billion (4% of the total).

Renewable energy project announcements have increased steadily over the past decade and this sector attracted the most greenfield investment in 2016.

When the amounts of investment projects announced for the region over the last three years are broken down, the automotive industry is clearly the most geographically concentrated, with 76% of the total in Mexico, 11% in Brazil and 9% in Argentina. That sector also accounts for the majority of announcements concerning Mexico (31% of the total). Meanwhile, in telecommunications, 59% of the projects' value was concentrated in Brazil and Mexico; yet it was the main sector in several countries of the region, in particular Colombia and Argentina (accounting for 19% and 16% of announced investments for the country, respectively).

The production of renewable energy has taken off in the region in the last two years. Through tenders and auctions conducted in many countries, this sector has become firmly established in the energy matrix: for example, in Honduras, 9.8% of the electricity supply comes from solar photovoltaic energy and in Uruguay, 22.8% of the electricity consumed in 2016 came from wind power (REN21, 2017). Many of these developments are the result of investment by transnational corporations, led by Spanish firms including Abengoa, Iberdrola and Acciona; the Italian company, Enel; Ireland's Mainstream Renewable Power; France's Engie; and firms from the United States and Canada. Among the region's companies, two Brazilian firms announced projects in recent years: Eletrobras, with projects in Panama, Peru and Uruguay; and Latin America Power, with projects in Chile, Panama and Peru. In 2016, two Chinese firms, Jinko Solar and Envision Energy, entered the Mexican market.

Of the countries of the region, Chile was the recipient of the most announced investments in renewable energy, with 33% of the total value announced for the sector in 2016, followed by Mexico, where energy market reforms and the consequent renewable energy tenders led to the country receiving 32% of the total amount announced (see figure I.12).

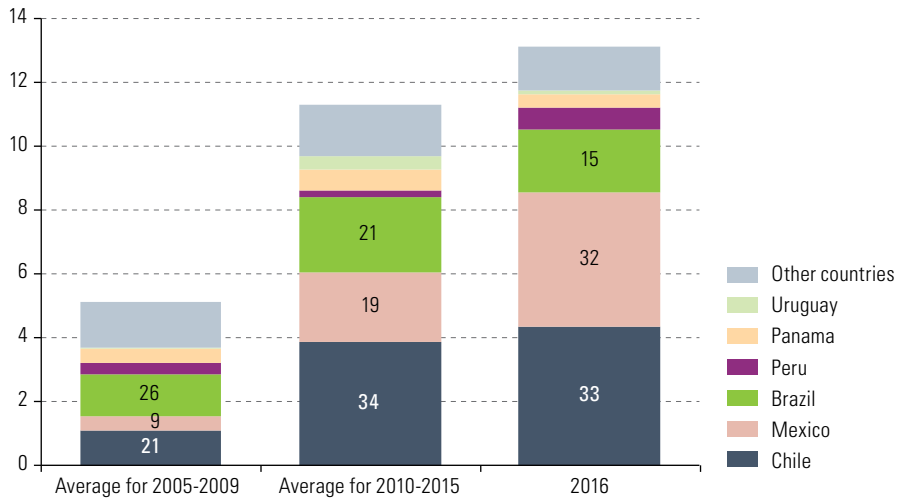


Figure I.12
Latin America and the Caribbean: value of announced FDI projects in renewable energy by country, 2005-2016
(Billions of dollars and percentages of the total)

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

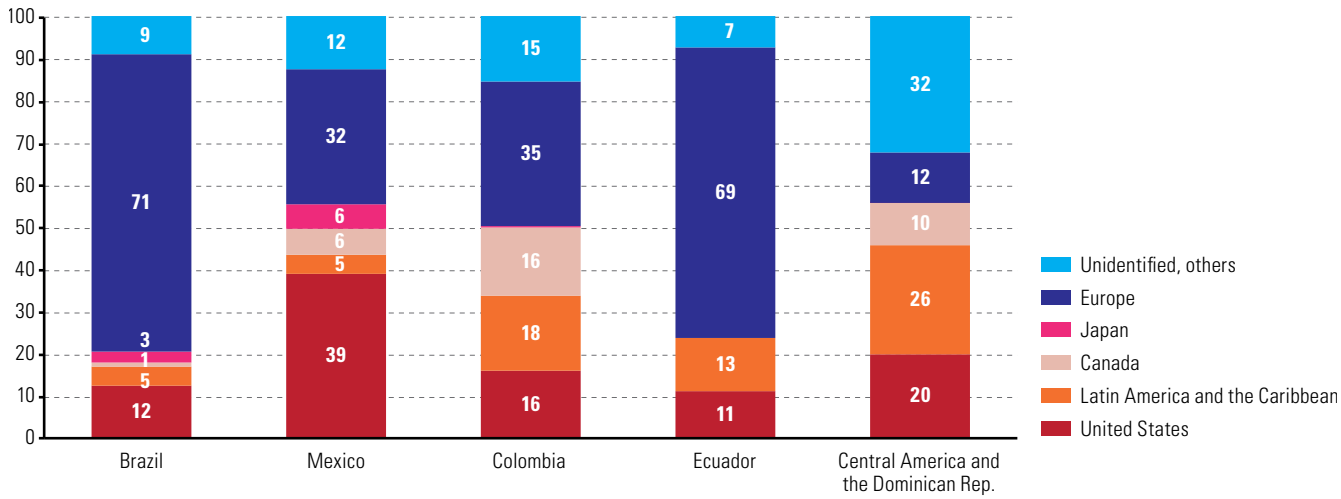
It should be remembered that investment in renewable energy worldwide decreased in 2016 owing to lower generation costs —average per-megawatt (MW) costs for solar photovoltaic and wind power fell by more than 10%— which meant that less investment was needed to increase supply, and to the investment slowdown in key markets such as China and Japan. Investment in renewable energy is expected to continue, though perhaps at a slower clip, particularly in smaller markets such as Uruguay, whose wind power market is close to saturation point, or Chile, where the low prices offered at solar energy auctions could make it difficult to secure funding (Frankfurt School-UNEP Collaborating Centre for Climate and Sustainable Energy Finance, 2017).

3. Lack of diversification among countries of origin

As in 2015, the United States was the leading investor in the region in 2016 (accounting for 20% of the total); nonetheless, as a block, Europe led the field in investment in Latin America and the Caribbean with 53% of the total, with the Netherlands accounting for the largest share of FDI flows (12%).[8]

The profile of investors differs within the region. European investors are more prevalent in South American countries, while in Mexico, Central America and the Caribbean, investment comes predominantly from United States firms. In 2016, European investors accounted for 71% of total investment in Brazil, a similar percentage to that seen in Ecuador, while in Central America and the Dominican Republic only 12% of investment came from Europe. Mexico had the highest flow of investment from the United States (39%) (see figure I.13).

Figure I.13
Latin America and the Caribbean (selected subregions and countries): origin of FDI, 2016
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.

With respect to cross-border mergers and acquisitions of companies located in the region, the United States and the European Union together accounted for half of the total value of transactions concluded in 2016 (29% and 24%, respectively), while Canada and China accounted for 15% and 12%, respectively. In terms of the number of transactions, the United States continued to lead the way (23% of the total), followed by Canada (15%), Spain (10%) and the United Kingdom (8%). Among the 20 largest transactions were energy sector acquisitions by firms from the United States, European countries, China and Canada (see table I.5).

[8] The weight of the Netherlands in the statistics bears little relationship to the presence of Dutch firms in the region, because many transnational corporations establish their subsidiaries in the Netherlands, attracted by its tax advantages, and the flows are registered as originating from that country (ECLAC, 2016a).

Table I.5
Latin America and the Caribbean: 20 largest cross-border mergers and acquisitions, 2016

Firm/ country of origin	Assets acquired/ country of assets	Sector	Amount (millions of dollars)	Country of seller
Brookfield Renewable Partners Canada	ISAGEN S.A., E.S.P. (99.6%) Colombia	Energy	3 528	Colombia
Statoil ASA Norway	Cuenca de Santos exploration block (66%) Brazil	Oil and gas	2 500	Brazil
Teva Pharmaceutical Industries Ltd. Israel	Representaciones e Investigaciones Médicas S.A. Mexico	Pharmaceuticals	2 300	Mexico
Anadarko Petroleum Corp. United States	Freeport-McMoRan-Gulf of Mexico Mexico	Oil and gas	2 000	United States
Vinci SA France	Línea Amarilla concession Peru	Services	1 661	Brazil
China Molybdenum Co. Ltd. China	Anglo American-niobium and phosphates Brazil	Mining	1 500	United Kingdom
I Squared Capital Advisors US LLC United States	Duke Energy Latin America Argentina, Chile, Ecuador, El Salvador, Guatemala and Peru	Energy	1 200	United States
China Three Gorges Corporation China	Duke Energy International Brazil Brazil	Energy	1 200	United States
FleetCor Technologies Inc. United States	Serviços e Tecnologia de Pagamentos S.A. Brazil	Services	1 089	Brazil
Coca-Cola Femsa S.A.B. de C.V. Mexico	Vonpar S.A. Brazil	Beverages	1 029	Brazil
Abertis Infraestructuras S.A. Spain	Autopista Central concession (remaining 50%) Chile	Services	1 028	Canada
Coty Inc. United States	Hypermarcas, beauty and personal care section Brazil	Manufacturing and retail	985	Brazil
Infraestructura Energética Nova, subsidiara de Sempra Energy United States	Ventika I and II wind farms Mexico	Energy	852	United States
Fintech Telecom LLC United States/Mexico	Telecom Argentina S.A. (46.31%) Argentina	Telecommunications	849	Argentina
Enel S.p.A. Italy	CELG Distribuição S.A. (94.8%) Brazil	Energy	647	Brazil
Prudential Financial Inc. United States	Administradora de Fondos de Pensiones Habitat S.A. (40.23%) Chile	Finance	625	Chile
Grupo de Inversiones Suramericana S.A. Colombia	RSA Insurance Group Latin America Argentina, Brazil, Chile, Colombia, Mexico and Uruguay	Finance	619	United Kingdom
Cubico Sustainable Investments Ltd. United Kingdom	Two wind farms from Casa dos Ventos Energias Renováveis (total 392 MW) Brazil	Energy	494	Brazil
Compass Minerals International Inc. United States	Produquímica Indústria e Comercio S.A. (remaining 65%) Brazil	Chemicals	480	Brazil
Hainan Airlines Co. Ltd. China	Azul S.A. (23.7%) Brazil	Transport	450	Brazil

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

United States firms concluded a number of large transactions in 2016, including the acquisition of Freeport-McMoRan oil assets in the Gulf of Mexico by Anadarko Petroleum Corp. for US$ 2 billion and the purchase of Duke Energy's Latin American portfolio by I Squared Capital Advisors for US$ 1.2 billion. United States and European firms were also eager to acquire road concessions or toll road operations, as evidenced by the acquisition of the Línea Amarilla highway in Peru by French group Vinci S.A. for US$ 1.66 billion, the purchase of Serviços e Tecnologia de Pagamentos S.A., Brazil's largest electronic toll payments firm, by United States group FleetCor Technologies Inc for US$ 1.089 billion, and Spanish company Abertis' buyout of the concession of Chile's Autopista Central for US$ 1.028 billion.

The largest transaction of the year was made by the Canadian firm Brookfield Renewable Partners, which purchased Colombian hydroelectric company ISAGEN for US$ 3.5 million, including the Colombian Government's 57.6% interest in that company. Canada was on par with the United States in terms of the number of transactions; however, as these primarily involved small mining deals, Canada had only one of the 20 largest transactions.

Conversely, Chinese firms carried out 3 of the largest 20 transactions, with the highest value purchases concentrated in the energy and mining sectors in Brazil. China Molybdenum Co. acquired the niobium and phosphates businesses of the British company, Anglo American, for US$ 1.5 billion and China Three Gorges Corporation bought the hydropower plants of the American firm Duke Energy Corp for US$ 1.2 billion. The US$ 450 million acquisition by Hainan Airlines Co. Ltd. of a 23.7% stake in Brazilian airline, Azul S.A., signalled a novel diversification of China's investment profile. China has thus cemented its role as a leading investor in Latin America and the Caribbean in recent years, and while it is only just beginning to participate in sectors other than extractive industries, the aforementioned transactions could point to a widening of the sectoral profile of Chinese capital in the region, as has been the case in Europe and the United States in the last two years (see section B of this chapter).

Two of the 20 largest transactions of 2016 were carried out by trans-Latin firms; both the Mexican Coca-Cola franchise and the Colombian company Sura extended their reach in the regional market (see section D). The sale of the Mexico-based pharmaceutical company, Representaciones e Investigaciones Médicas S.A., to the Israeli multinational Teva Pharmaceutical Industries was the second largest transaction of the year. However, a legal battle ensued between buyer and seller, leading to the shutdown of the manufacturing plant.[9] Unlike in previous years, there were few major telecoms transactions, with only one among the 20 largest.

One of the largest divestment operations of 2016 occurred in the financial sector. The British bank, HSBC Holdings, sold all of its Brazilian operations to Banco Bradesco S.A. for US$ 5.186 billion, in line with its strategy of retreating from emerging markets (see table I.6).

The divestment strategy undertaken by Petrobras was reflected in the sale of assets in Brazil and abroad. In particular, a 67.19% stake of Petrobras Argentina S.A. was sold to Argentine company Pampa Energía S.A. for US$ 892 million. While the energy sector has received major investments from transnational corporations, local firms have also been making acquisitions. For example, the Brazilian company CPFL Energia purchased Distribuidora Gaúcha de Energia S.A. from United States-based AES Corporation for US$ 464 million, and the Argentine group Desarrolladora Energética S.A. expanded its presence in the province of Buenos Aires by acquiring control of the concessions granted to Empresa Distribuidora de Energía Norte S.A. and Empresa Distribuidora de Energía Sur S.A.

[9] At the time of writing, it was not known whether the dispute had been resolved, although there were suggestions in April 2017 that the company might resume operations within a few months (see Reuters, 2017).

Table I.6
Latin America and the Caribbean: 10 largest divestments, 2016

Selling firm/ country of seller	Assets sold/ buyer	Sector	Amount (millions of dollars)	Country of buyer
HSBC Holdings PLC United Kingdom	HSBC Bank Brazil S.A.-Banco Multiplo, HSBC Serviços e Participações Ltda. Banco Bradesco S.A.	Finance	5 186	Brazil
Petroleo Brasileiro S.A. Brazil	Petrobras Argentina S.A. (67.19%) Pampa Energia S.A.	Oil and gas	892	Argentina
AES Corp. United States	AES Sul Distribuidora Gaucha de Energia S.A. CPFL Energia S.A.	Energy	464	Brazil
Institutional investors United States, Venezuela (Bolivarian Repepublic of)	Empresa Distribuidora de Energia Norte S.A., Empresa Distribuidora de Energia Sur S.A. Desarrolladora Energetica S.A.	Energy	220	Argentina
Lyondell Basell Industries Netherlands	Petroken Petroquimica Ensenada S.A. Grupo Inversor Petroquimica	Manufacturing	184	Argentina
EDP-Energias de Portugal S.A. Portugal	Pantanal Energetica Ltda. Cachoeira Escura Energetica S.A.	Energy	124	Brazil
Sears Holdings Corp. United States	Sears Operadora Mexico S.A. de C.V. (remaining 14%) Grupo Sanborns S.A.B. de C.V.	Retail	106	Mexico
KLS Ltd. Republic of Korea	Marcobre S.A.C. (remaining 30%) Minsur S.A.	Mining	85	Peru
Host Hotels & Resorts Inc. United States	Hotel Sheraton Santiago and San Cristóbal Tower Larrain Vial S.A.	Hotels	76	Chile
International Meal Co. Alimentaçao S.A. Brazil	Inversionistas en Restaurantes de Carnes y Cortes Taco Holding SAPI de CV (subsidiary of Nexxus Capital)	Restaurants	61	Mexico

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

4. FDI remains the most stable component of capital inflows

The effects of FDI on external accounts can be assessed based on several factors. First, foreign investment continues to be the largest and most stable financial account component. In 2016, despite a 7.8% decline, FDI accounted for 71% of foreign capital inflows. The other two components were worth less and were more volatile: portfolio investment increased by 4.5%, but remained much lower than levels attained between 2010 and 2014, while other investment inflows collapsed (see figure I.14).

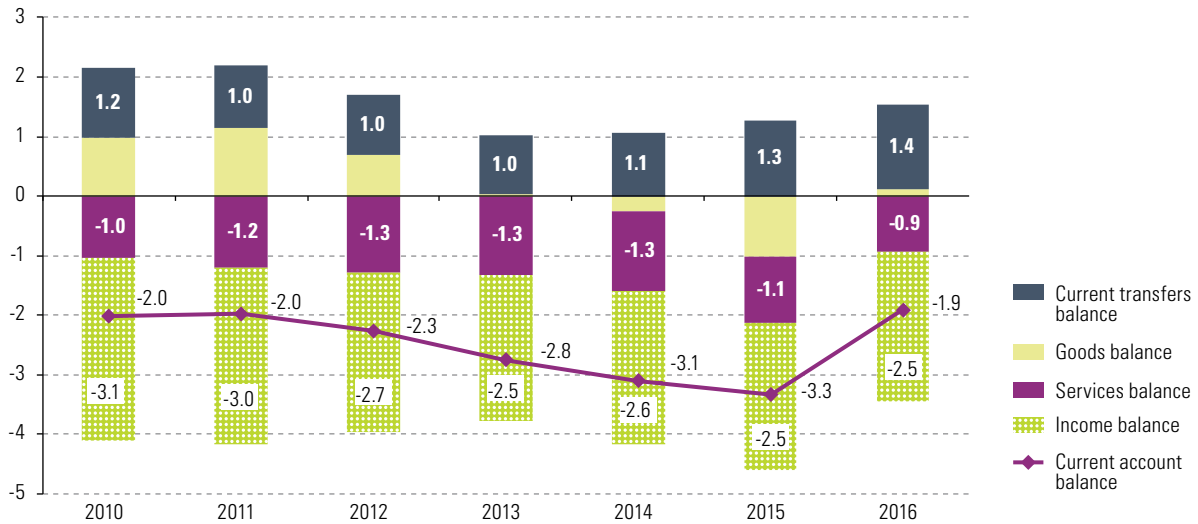
In 2016, despite a 7.8% decline, FDI accounted for 71% of foreign capital inflows.

Figure I.14
Latin America and the Caribbean: cross-border capital inflows, 2005-2016
(Billions of dollars)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.
Note: FDI data prior to 2010 are not directly comparable with those for 2010 and later. This is represented by a white line on the graph.

Secondly, it is important to consider the effect of FDI income on the balance-of-payments current account, which has declined steadily since 2006 reaching a negative value equivalent to -3.3% of GDP in 2015, largely as a result of the deteriorating goods balance. In 2016, however, the deficit narrowed, reaching the equivalent of -1.9% of GDP, thanks to the sharp fall in the goods balance deficit caused by the economic downturn, which led to a contraction in imports that outweighed the drop in exports. The services balance deficit also narrowed, though to a lesser extent, and current transfers increased (see figure I.15).

Figure I.15
Latin America and the Caribbean: balance-of-payments current account by component, 2010-2016
(Percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Economic Survey of Latin America and the Caribbean, 2017*, briefing paper, Santiago.

The income balance is the component with the largest deficit and the one that produces the greatest net outflows of funds abroad. Within this item, the biggest component is the repatriation of FDI profits by transnational firms to their parent companies and, despite the drop in FDI income in 2016, the income balance deficit is still equivalent to -2.5% of GDP.

When FDI inflows and income outflows derived from FDI stock in each country are combined, their impact on the balance of payments becomes clear. While the impact of FDI is generally positive, the picture is more complex when considering the different countries of the region.

From 2010 to 2016, FDI had a positive impact on the balance of payments in Brazil, Chile, Colombia, Costa Rica, Mexico, Nicaragua, Panama and Uruguay, while net balances were close to zero in Argentina, the Dominican Republic, Ecuador, Guatemala and Honduras. By contrast, the income generated by FDI stock exceeded new capital inflows in Paraguay, Peru and the Plurinational State of Bolivia (see figure I.16). As FDI inflows stagnate or drop, the resultant increase in capital stock and income (even with lower profitability) could weigh even more heavily on the balance of payments.

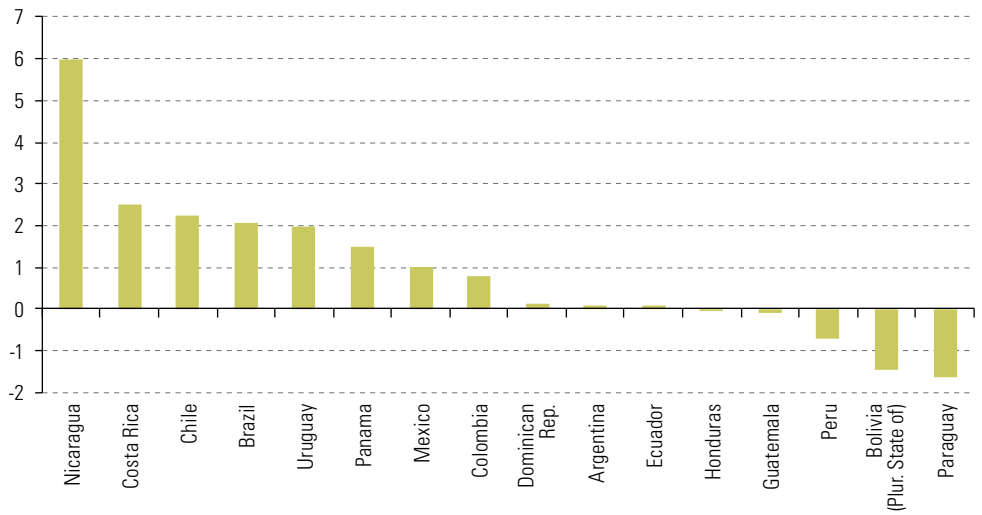


Figure I.16
Latin America and the Caribbean (selected countries): balance between FDI inflows and FDI income outflows, average for the period 2010-2016
(Percentages of GDP)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.

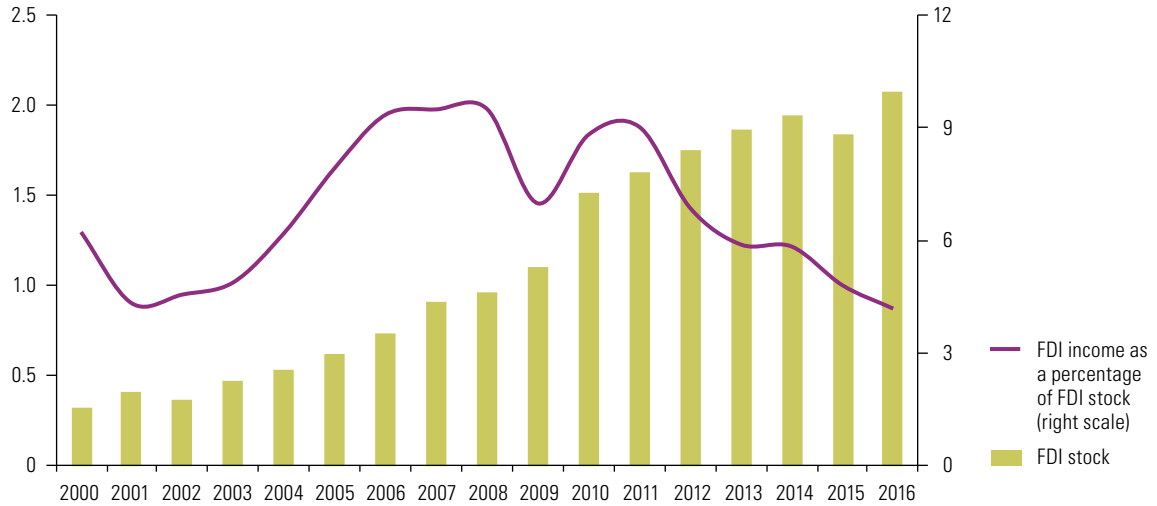
5. Decreasing FDI profitability is damaging investment prospects

Despite a 12.8% rise in FDI stock in 2016 to a record high, the average profitability of foreign capital stock[10] fell again, reaching its lowest level of the last 15 years (4.2%) (see figure I.17). Around 55% of this income was repatriated to the countries of origin, meaning that there was a relative increase in reinvested earnings compared with the repatriated earnings, which were as high as 70% in 2013.

Average FDI profitability differs depending on each country's specialization. In 2016, economies that invested heavily in mining and hydrocarbons saw a much steeper decline, as was the case in Colombia, Peru, the Plurinational State of Bolivia, and, to a lesser extent, Chile. Nevertheless, profitability fell in all of the countries under consideration in 2016, with the exception of Panama (see figure I.18).

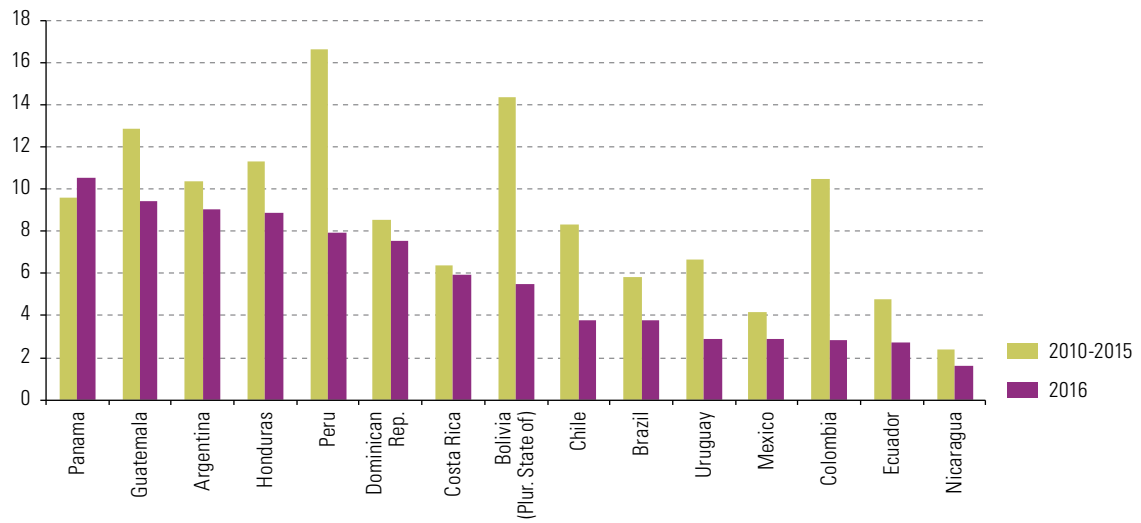
[10] Calculated as the ratio of FDI income to capital stock, based on balance-of-payment data.

Figure I.17
Latin America and the Caribbean:[a] stock and average profitability of FDI, 2000-2016
(Trillions of dollars and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.
Note: Average profitability is measured as FDI income divided by FDI stock.
[a] Does not include data for the Bolivarian Republic of Venezuela, Jamaica, Trinidad and Tobago or the member countries of the Organisation of Eastern Caribbean States (OECS).

Figure I.18
Latin America and the Caribbean (selected countries): average profitability of FDI, 2010-2016
(Percentages)



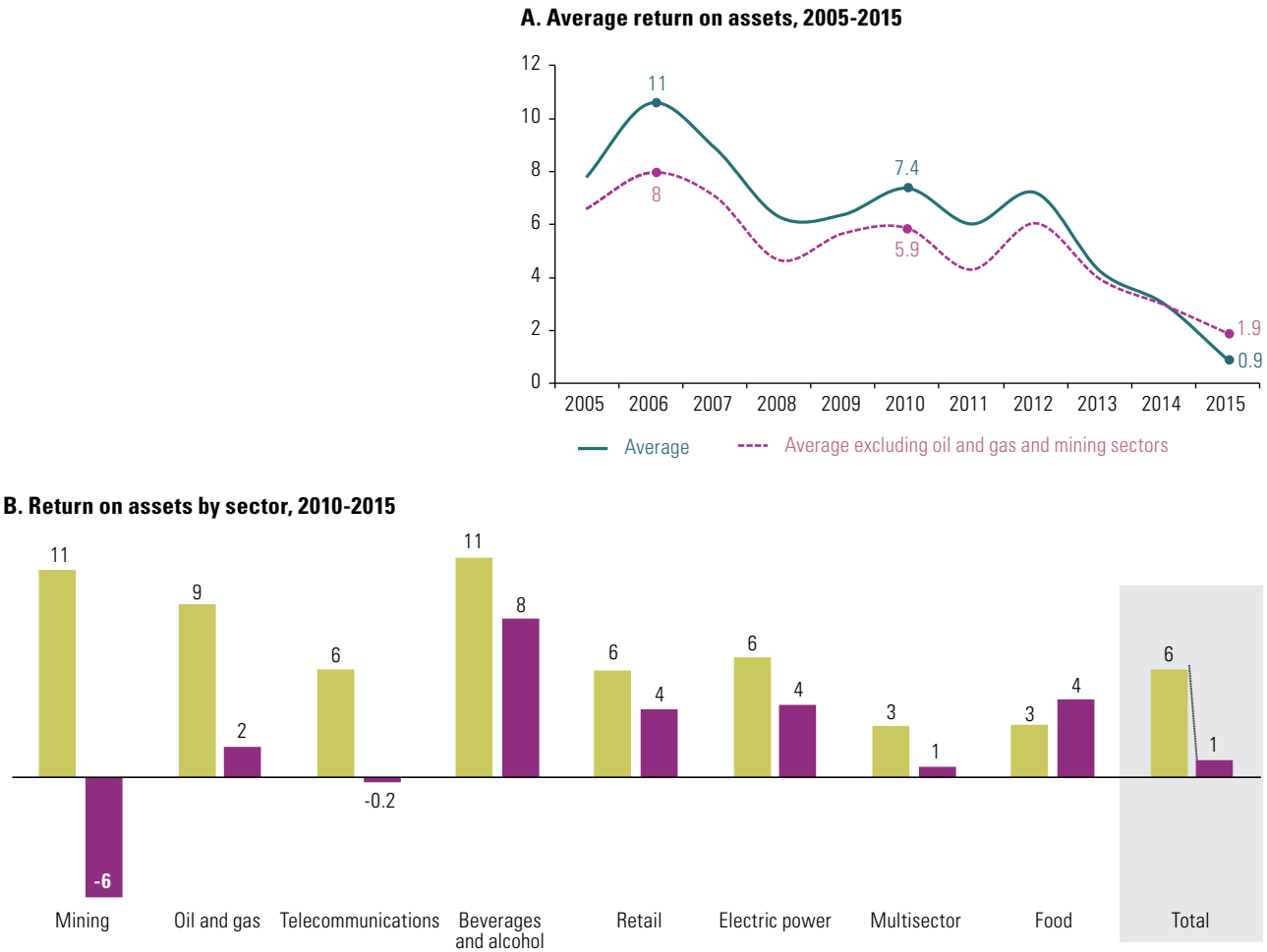
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.
Note: Average profitability is calculated as the ratio between FDI income and FDI stock.

At the company level, available data for the 500 largest companies in the region, both domestic and foreign-owned, show that the return on assets has been falling since 2010,[11] when it was 7.4% (5.9% excluding natural resources). Since then it has continued to drop, reaching 0.9% (1.9% excluding natural resources) in 2015.

[11] Unlike average FDI profitability, the return on assets is calculated on the basis of data from the 500 largest companies in Latin America as ranked by *América Economía*, based on the ratio of profits to the published value of assets for a given year.

Although the decline in average return on assets has primarily been the result of the plummeting prices of mining products, almost all sectors of the economy have experienced a downturn (see figure I.19). A comparison of the average for the period 2011-2014 with 2015 shows that the mining and oil and gas sectors were dealt the heaviest blow, and that the telecommunications sector also saw a significant decline.

Figure I.19
Latin America and the Caribbean: return on assets, average and by sector
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from *América Economía*.
Note: The data show results for the 500 biggest firms, by annual turnover, in Latin America and the Caribbean, excluding those firms that do not publish specific data on their subsidiaries abroad. The data cover cross-border and national firms, but not State-owned firms. The sectors included in figure B are the eight sectors with the highest turnover, according to *América Economía* (2015). The average sectoral return on assets is calculated as the ratio between profits and assets.

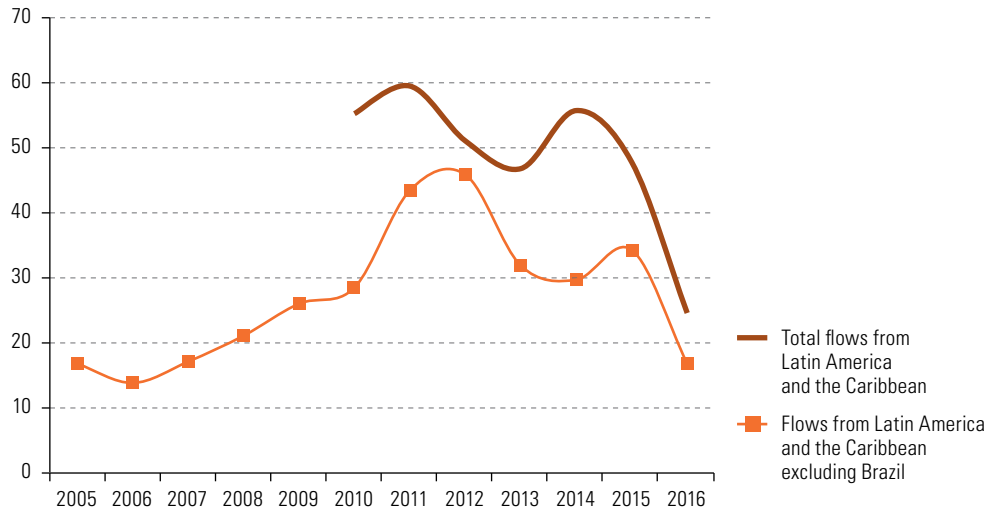
Sectors geared more towards the domestic market (for example beverages) or that have natural advantages strengthened by innovation processes (such as food and agribusiness) have seen relatively stable rates of return, at least in the case of the large companies. The pattern is similar in service activities such as retail or electric power, which, despite a slight fall, continue to maintain above-average rates of return.

While lower returns for transnational firms and levels of repatriation of profits might be considered positive for the balance of payments, the trend is worrying because it has a negative effect on these companies' investment prospects and, consequently, those of major production sectors.

D. A weak year for trans-Latin firms

In 2016, outward FDI flows from Latin American and Caribbean countries tumbled by 47% to US$ 25.567 billion. In 2015, Brazil had posted the sharpest fall in investment outflows, while those from the other countries had grown; in 2016, outward FDI flows from those other countries were also strongly affected and investment values returned to levels seen in the mid-2000s (see figure I.20).[12]

Figure I.20
Latin America and the Caribbean: outward FDI flows, 2005-2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.

Three countries are the main sources of external capital flows: Brazil, Chile and Mexico, accounting for 82% of FDI originating in the region, on average, between 2010 and 2016. However, FDI outflows from the three countries dropped significantly in 2016 and their combined share of the total fell to 73%. Brazil invested most abroad (31%), followed by Chile (28%), with Mexico in fourth place, with 14% of the total. This relative drop in Mexico's ranking was due to the sharp drop in investments originating in Mexico and the jump in investments from Colombia, which moved into third place with 18% of total of FDI outflows in 2016 (see table I.7).

Table I.7
Latin America and the Caribbean (selected countries): outward FDI flows, 2005-2016
(Millions of dollars and percentage variation)

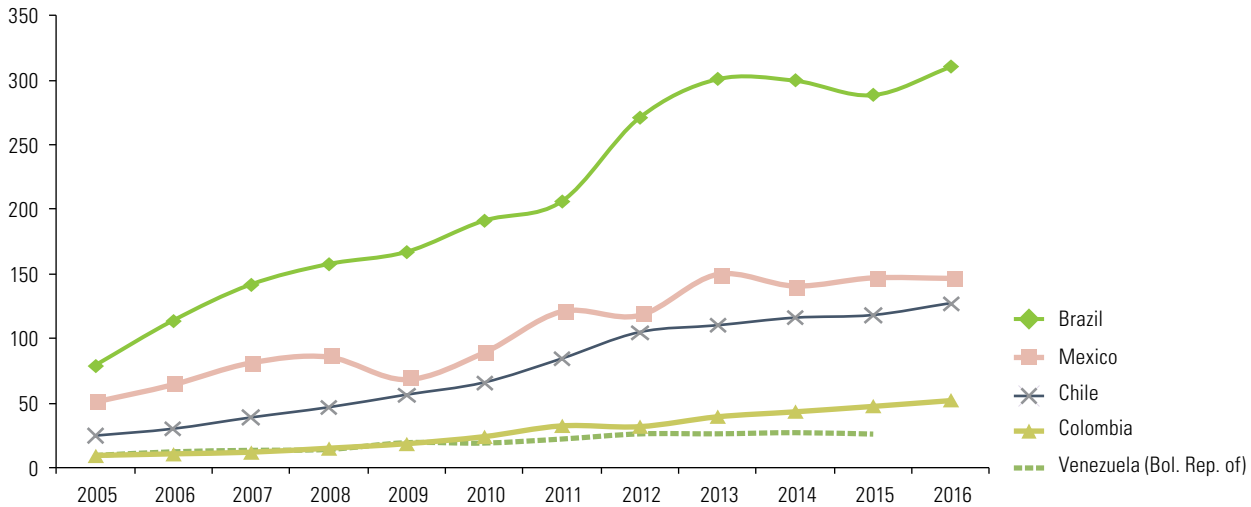
	2005-2009[a]	2010	2011	2012	2013	2014	2015	2016	Absolute variation 2016-2015 *(millions of dollars)*	Relative variation 2016-2015 *(percentages)*
Argentina	1 471	965	1 488	1 055	890	1 921	875	1 787	911	104
Brazil[b]	14 067	26 763	16 067	5 208	14 942	26 040	13 518	7 815	-5 703	-42
Chile	5 117	9 461	20 252	20 556	9 888	12 800	16 742	7 125	-9 617	-57
Colombia	2 786	5 483	8 420	-606	7 652	3 899	4 218	4 516	299	7
Mexico	7 097	8 910	11 856	18 908	11 609	8 530	12 301	3 657	-8 644	-70
Venezuela (Bolivarian Republic of)[c]	1 227	2 492	-370	4 294	752	1 024	-1 112	...		
Latin America and the Caribbean[d]	**33 036**	**55 279**	**59 532**	**51 091**	**46 824**	**55 756**	**47 818**	**22 567**	**-22 251**	**-47**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.
[a] Simple averages.
[b] The 2005-2009 figure for Brazil does not include reinvestment of profits, and is therefore not directly comparable to the figures from 2010 onward.
[c] Data for the first three quarters of 2015.
[d] For the region overall, the variation between 2016 and 2015 was calculated excluding the Bolivarian Republic of Venezuela.

[12] The expansion operations of trans-Latin firms into third markets, new projects or already established subsidiaries may not be recorded in the FDI outflows of the country if external financing mechanisms are used.

In 2016, Brazil had the largest stock of outward FDI in the region, followed by Mexico (see figure I.21). Both countries' stock showed strong growth until 2013, and did not increase significantly thereafter. Over the period 2005-2016, Brazil quadrupled its stock while that of Mexico tripled. Chilean and Colombian FDI stock abroad continued to grow, with fivefold and sixfold increases, respectively. In contrast, the FDI stock of the Bolivarian Republic of Venezuela stalled in 2012 at levels that were three times higher than in 2005, and there are no data for 2016.

Figure I.21
Latin America (selected countries): stock of FDI abroad, 2005-2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as of 15 June 2017.

An analysis of complementary variables, such as mergers and acquisitions or project announcements, gives a more detailed picture of the evolution of FDI flows originating in the region. The difficulties faced by the main Brazilian transnational companies in 2016 explains why there are no companies from that country among the main mergers and acquisitions of 2016, when in previous years they were the main investors abroad. Mexican companies made large acquisitions abroad, as did firms in Chile and Colombia (see table I.8). The Mexican group Carso carried out the largest transaction of the year, acquiring an additional 25.66% of the share capital of the Spanish construction company, Fomento de Construcciones y Contratas S.A., for US$ 6.919 billion to become the majority shareholder. The other billion-dollar transaction was the acquisition of Brazilian beverage bottling and distribution company Vonpar S.A. by Mexican bottler Coca-Cola FEMSA. Meanwhile, three other Mexican companies and one Colombian company acquired operations in the construction materials sector in the United States, a market which could see significant growth in the coming years, if the infrastructure investments proposed by the new administration come to fruition.

According to the FDI announcements compiled in *fDi Markets*, companies from the region had high prospects for growth until 2013, but average annual values fell after 2014, particularly in Brazil, Colombia and Mexico (see figure I.22). Following the slump, Brazilian companies have announced a higher number of FDI project announcements in the last three years, albeit for smaller amounts than in the past.

For the region as a whole, 21% of the value of all announced projects over the last three years was concentrated in telecommunications, on the back of transactions

According to the FDI announcements compiled in *fDi Markets*, companies from the region had high prospects for growth until 2013, but average annual values fell after 2014.

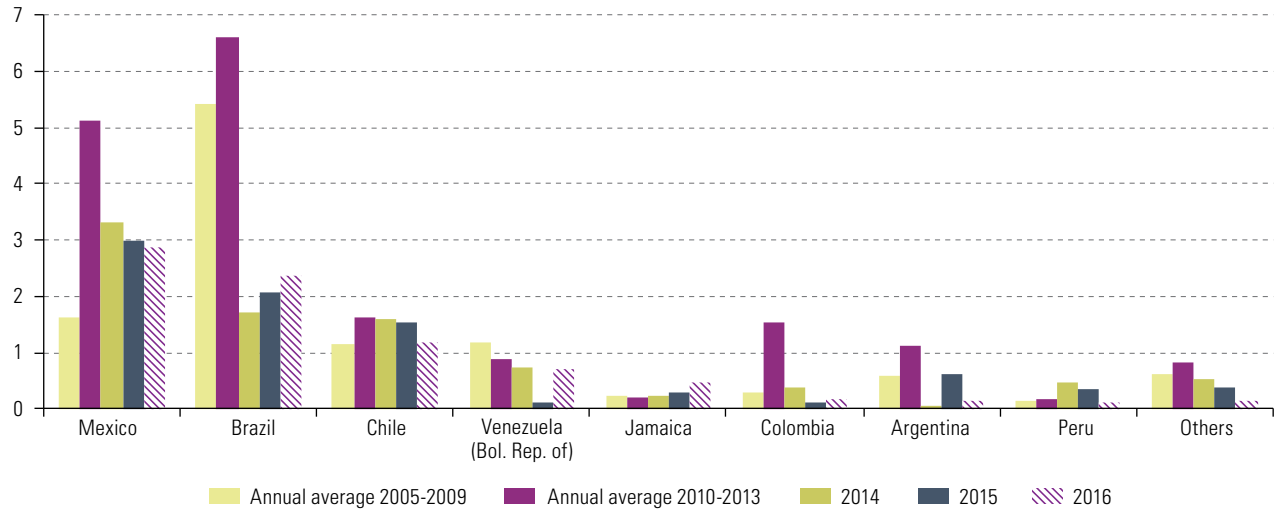
conducted by Mexico's América Móvil and Jamaica's Digicel, which accounted for 83% and 15%, respectively, of the total announced in the sector for the period 2014-2016. In addition, most of the announcements (14% of the total) concerned the food and tobacco sector, and 83% of the projects announced for that sector were led by companies from Brazil, Chile and Mexico. The retail and construction materials sectors also stood out, accounting for 8% and 7% of the total, respectively. The leaders in the retail sector were the Chilean companies Cencosud and Falabella, while in the construction materials sector, more than half of the total value of investments announced came from Mexico, primarily driven by CEMEX.

Table I.8
Latin America and the Caribbean: largest cross-border acquisitions by trans-Latin firms, 2016

Firm/ country of origin	Assets acquired/ country of assets	Sector		Country of seller
Inmobiliaria Carso S.A. de C.V. Mexico	Fomento de Construcciones y Contratas S.A. 25.66%, to total 51.3%) Spain	Construction	6 919	Spain
Coca-Cola FEMSA S.A. B. de C.V. Mexico	Vonpar S.A. Brazil	Beverages	1 029	Brazil
Vitro S.A.B. de C.V. Mexico	PPG industries (flat glass section) United States and Canada	Construction materials	750	United States
Cementos Argos S.A. Colombia	Heidelberg Cement Group plant and assets in the United States United States	Construction materials	660	Germany
Grupo de Inversiones Suramericana S.A. Colombia	RSA Insurance Group (in Latin America) Argentina, Brazil, Chile, Colombia, Mexico and Uruguay	Finance	619	United Kingdom
Empresas COPEC S.A. Chile	MAPCO Express Inc. chain United States	Retail	535	United States
Elementia S.A.B. de C.V. Mexico	Giant Cement Holding Inc. (55%) United States	Construction materials	525	Spain
Grupo Cementos de Chihuahua S.A.B. de C.V. Mexico	CEMEX S.A.B. de C.V. cement plants in the United States United States	Construction materials	306	United States
Empresas COPEC S.A. Chile	Solgas Peru	Oil and gas	302	Spain
Grupo Industrial Saltillo S.A.B. de C.V. Mexico	Infun Group S.A. Spain and China	Automotive	296	Spain

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

Figure I.22
Latin America and the Caribbean: foreign investment announcements by companies from the region, 2005-2016
(Billions of dollars)



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

Between 2014 and 2016, 10 companies accounted for 48% of the total value of investments announced for the region, most of which was destined for countries in Latin American and the Caribbean (see table I.9). Chile and Mexico had the most companies in this group, while Brazil had only two.

Table I.9
Latin America and the Caribbean: companies with highest announced amount of foreign investment, 2014-2016

Firm	Percentage of total value announced for the region, 2014-2016	Country of origin	Sector	Main destination of projects (percentage of total value of the company)
America Móvil	17	Mexico	Telecommunications	Brazil (43), Argentina (11), Dominican Republic (11)
CEMEX	5	Mexico	Construction materials	Philippines (53), Dominican Republic (22)
Cencosud	4	Chile	Food and tobacco	Brazil (59), Colombia (22)
Natura	4	Brazil	Beauty products	Argentina (51), Mexico (12), France (12)
GMR Empreendimentos e Participações	3	Brazil	Renewable energies	Chile (100)
LATAM Airlines	3	Chile	Transport	Brazil (98)
Petróleos de Venezuela (PDVSA)	3	Venezuela (Bolivarian Republic of)	Oil and gas	Germany (52), Bolivia (Plurinational State of) (24), United States (16)
Digicel	3	Jamaica	Telecommunications	Trinidad and Tobago (63), El Salvador (27)
Falabella	3	Chile	Retail	Colombia (64), Peru (18)
Grupo Posadas	2	Mexico	Hotels and tourism	United States (100)

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

E. It is essential to rethink strategies to attract FDI

In 2016, global FDI flows stagnated, although they remained at high levels. Developed countries resumed the leading role that they had lost in previous years. In contrast, a number of developing countries and regions that had benefited from the price boom in natural resources saw their FDI inflows drop.

One new development is China's increasing importance as a foreign investor. Chinese transnational companies have played a large role in increasing FDI flows to developing economies. Today, FDI outflows from China have diversified. Given the country's level of industrial development, controlling natural resources (in particular mineral resources) is less important than incorporating technology. Meanwhile, the rapidly shifting international technological frontier following the fourth industrial revolution means that any country that seeks stable and sustainable economic development must act quickly and boldly to incorporate new technologies into production processes.

The consolidation of the globalization triad (developed economies of the United States, Western Europe and East Asia) has had an impact on inflows into Latin America and the Caribbean. In nominal terms, the total value of FDI flows into the region in 2016 was similar to the level seen in 2010, while several countries saw sizeable decreases. The region's poor macroeconomic results over the last three years have undermined investments that sought to take advantage of growing domestic markets or to co-finance public infrastructure projects. The economic recovery in European countries and the United States, together with the resurgence of protectionist forces in the latter, created an external climate that was less conducive to FDI inflows to the region for export platforms (see box I.1).

From a structural point of view, the production pattern of the region —especially of the South American countries— with heavy reliance on natural resources makes it difficult to boost FDI inflows.

ECLAC expects economic activity in the region to pick up slightly (1.1%) in 2017, which is unlikely to lead to greater FDI for domestic markets and infrastructure development. Moreover, the declining return on investments in some key sectors, such as telecommunications, may make them less appealing to foreign investors.

South American economies, specialized in the production of commodities, in particular oil and minerals, and with strong commercial ties to China, will be affected by the global economic situation, as well as their very low growth rates (ECLAC expects 0.6% growth for 2017). While the growth forecasts for Central America and Mexico are more favourable, 3.6% and 2.2%, respectively, the uncertainty surrounding the NAFTA renegotiation may affect the flow of investment to those countries.

Taking all of this into account, ECLAC expects FDI inflows to the region to fall again by up to 5% in 2017.

Taking all of that into account, ECLAC expects FDI inflows to the region to fall again by up to 5% in 2017.

In this scenario, foreign investments that help to narrow the region's production and social gaps are increasingly important. FDI can be a key factor in technology transfer and the adoption of new management systems and business models that increase competitiveness and productivity. It can also play an important role in the development of road, port, energy and telecommunications infrastructure, especially in the context of fiscal spaces that are narrower than they were during the most recent commodity price boom.

However, the positive effects of FDI are not automatic. The results in terms of integrating technology, promoting research and development and creating good-quality jobs have, in most cases, fallen short of expectations (ECLAC, 2016a). It is therefore important to review and improve Latin American and Caribbean countries' strategies for attracting FDI, so that they focus more on modernizing the economy and diversifying production.

Box I.1
United States: the new Administration and foreign direct investment

The new United States Administration has stated that one of its priorities is to reform corporate taxes, in order to boost the economy and increase FDI.[a] The United States has tax legislation that has remained unchanged for the last 30 years, a tax system that has global reach and a higher corporate tax rate than the other economies of the Organization for Economic Cooperation and Development (OECD), although the effective rate may be lower.

The current United States tax regime has pushed many transnationals to establish their headquarters in more favorable jurisdictions, such as Ireland or the Netherlands. Meanwhile, the high cost of repatriating profits leads firms to keep their earning —an estimated US$ 2.1 trillion (Bloomberg, 2015)— abroad. Many of these profits belong to digital technology and pharmaceutical companies such as Apple, Microsoft or Pfizer, which generate substantial international earnings thanks to intellectual property rights.

Corporate income tax, 2016

Country	Rate
Switzerland	8.5
Ireland	12.5
Canada	15.0
Germany	15.8
United Kingdom	20.0
Japan	23.4
Netherlands	25.0
Mexico	30.0
France	34.4
United States	35.0

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Organization for Economic Cooperation and Development (OECD), "Corporate and capital income taxes", OECD Tax Database, 2016.

Although no official reform has been presented yet, proposals made to date include moving to a territorial system and cutting the corporate rate from 35% to between 15% and 20%.

Implementing a sweeping tax reform could disrupt the global investment landscape, particularly in the light of the United States' already dominant position. If this reform goes hand in hand with policies that encourage innovation and research and development, it could have a positive impact on FDI inflows to the country, particularly in digital technologies, the pharmaceutical industry (already the main recipient of FDI), the services sector and the financial sector (Ernst and Young, 2017).

However, future FDI inflows, particularly those originating in China, could be subject to further review by the authorities. The Committee on Foreign Investment in the United States (CFIUS) allows the government to examine and, possibly, block mergers and acquisitions that threaten national security. It was established in 1975 in response to concerns about the increase in investments from the countries of the Organization of the Petroleum Exporting Countries (OPEC), because they were considered to be driven primarily by political rather than economic reasons. Today, with increased Chinese investments raising similar concerns in both the United States and Europe, CFIUS is expected be given a more prevalent role.

Source: Bloomberg, "U.S. Companies are Stashing $2.1 Trillion Overseas to Avoid Taxes", 4 March 2015 [online] https://www.bloomberg.com/news/articles/2015-03-04/u-s-companies-are-stashing-2-1-trillion-overseas-to-avoid-taxes; Ernst and Young, *The Outlook for Global Tax Policy In 2017: United States Tax Reform*, Washington, D.C., 2017 [online] http://www.ey.com/Publication/vwLUAssets/ey-the-outlook-for-global-tax-policy-in-2017-us-tax-reform/$FILE/ey-the-outlook-for-global-tax-policy-in-2017-us-tax-reform.pdf.

[a] See "A Better Way: Our Vision for a Confident America" [online] https://abetterway.speaker.gov/_assets/pdf/ABetterWay-TaxPolicyPaper.pdf.

FDI has been crucial to expanding export activities, to growth (the automotive industry) and to creating new sectors (digital economy), but wide productivity and technology gaps and technological lags show the limitations of these positive effects. The fourth industrial revolution is a double-edged sword for the region that could heighten the risk of further widening the divide between winners and losers, among other things. Some developed countries with intensive manufactures production, and probably China, will become more competitive and will increasingly focus on the highest value added stages of global production chains.

Given that the benefits of FDI depend not only on the type of investment, but also on the characteristics of the production systems of recipient countries, countries' ability to take ownership of these benefits is closely linked to factors such as the workforce's level of education, the competitiveness of local industry and its ability to develop links as suppliers to foreign companies, or the existence of a cluster of related businesses. The production and entrepreneurial context of the region —with its large productivity gaps among economic sectors and actors— means that policies that build local capacities must be implemented. These policies, together with FDI inflows, will help to create more dynamic production systems capable of producing higher value-added goods.

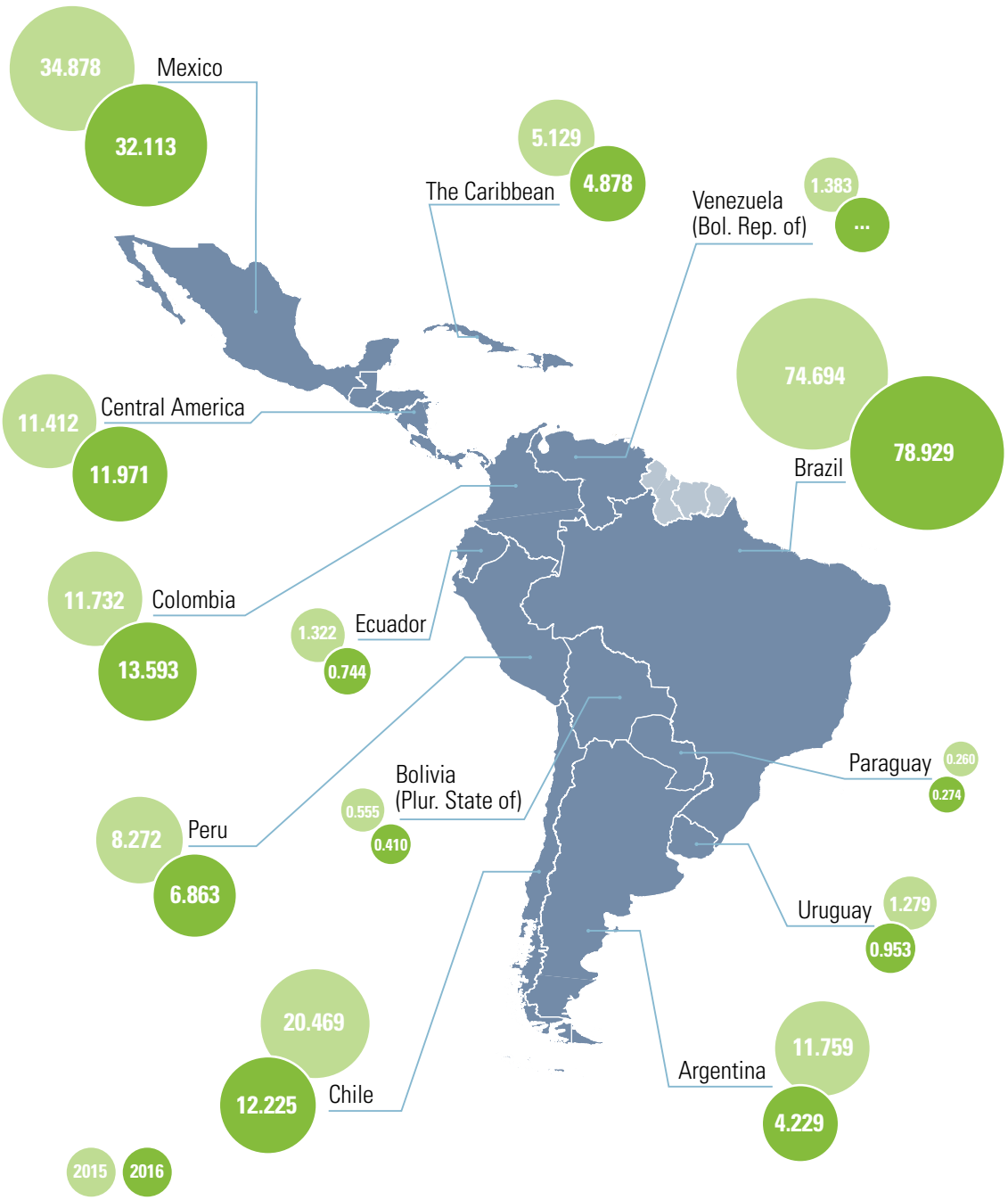
In short, to attract FDI, policies are needed that are holistic and coordinated with capacity-building in recipient countries. This is essential for creating the conditions that, on the one hand, make a country attractive to investors and, on the other, enhance the capacity of local production systems to absorb the potential benefits of FDI.

F. Country analysis: instances of FDI growth are few and far between

FDI inflows to South America fell 9.3% to US$ 118.219 billion, with only three countries receiving greater volumes of FDI than in 2015: Colombia, which recorded the highest growth, Brazil and Paraguay (see map I.1). In Central America, where FDI expanded by 4.9% to US$ 11.971 billion, only Panama and Costa Rica registered higher levels of FDI. In the Caribbean, FDI reached US$ 4.878 billion, with five countries —the Bahamas, Barbados, the Dominican Republic, Grenada and Saint Lucia— recording larger inflows than in 2015.

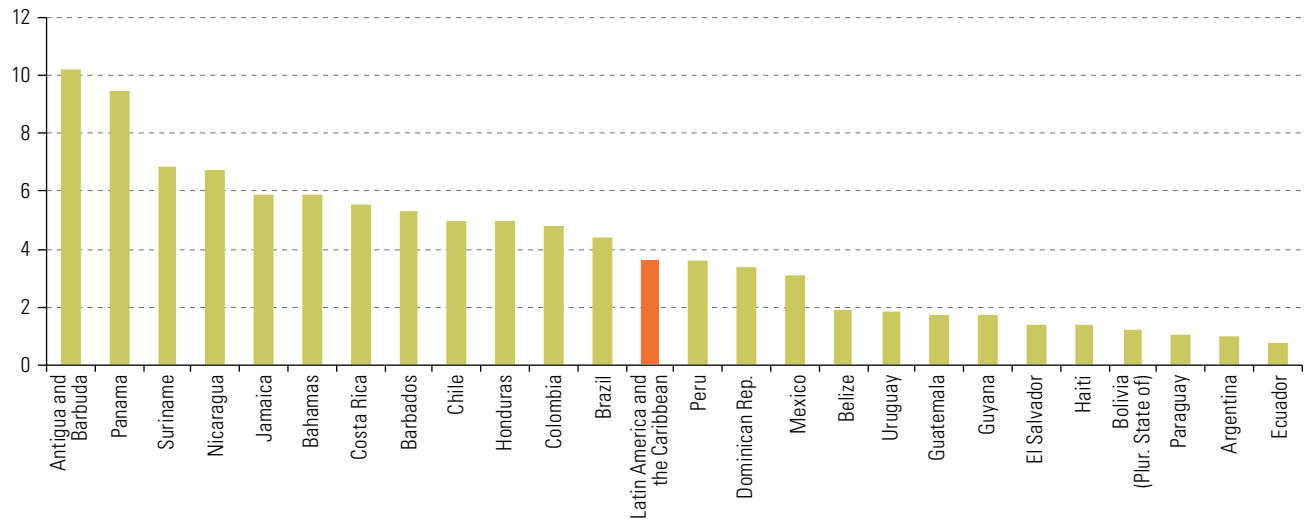
The region of Latin America and the Caribbean has received a larger share of FDI as a percentage of GDP than the rest of the world, underscoring the relative weight of transnational companies in the region's economies. Inward FDI was equivalent to 3.6% of GDP, while the global average stood at 2.5% (UNCTAD, 2015). In general, the region's smaller economies received larger amounts of FDI relative to their GDP; for example, in Antigua and Barbuda, Barbados or Suriname, inflows are small in absolute terms, but are significant for the economy (see figure I.23). Similarly, in economies that have promoted FDI as part of their development strategies —such as Chile and Panama— inflows as a percentage of GDP are larger (4.9% and 9.4%, respectively), while Brazil's inward FDI as a share of GDP (4.4%) was higher than that of other emerging economies which are also large recipients of this type of investment, such as China (1.2%) and India (2.0%).

Map I.1
Latin America and the Caribbean (selected subregions and countries): foreign direct investment inflows, 2015 and 2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of preliminary figures and official estimates at 15 June 2017.
Note: The subregional total for the Caribbean excludes Trinidad and Tobago in 2016, since the respective information was not available. The data for Bolivarian Republic of Venezuela refer to the first three quarters of 2015.

Figure I.23
Latin America and the Caribbean: FDI flows, 2016
(Percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of preliminary figures and official estimates at 15 June 2017.

1. Investment in Brazil remains resilient despite the recession

In 2016, Brazil's inward FDI was up 5.7% from the year before and came in at US$ 78.929 billion. Since the mid-2000s, Brazil has been the most attractive market for foreign investment in the region, apart from being an important destination for transnational companies worldwide. In 2015 and 2016 it was the eighth largest recipient of FDI in the world, and the third emerging economy behind China and Singapore.

The recovery cannot be explained by new incoming capital, but rather by continued and greater investment by transnational companies domiciled in the country.

Capital inflows —excluding reinvested earnings— were the most important component of FDI (57%), but fell 9.3% in 2016. Hence, the recovery cannot be explained by new incoming capital, but rather by continued and greater investment by transnational companies domiciled in the country. Intercompany lending and reinvestment of earnings increased, with the first accounting for 32% of total inward FDI after growing 38% in 2016. This increase followed the sharp contraction of 2015, and despite being much lower than in 2013 and 2014, transnational companies did receive greater volumes of external financing in 2016. Reinvested earnings represented a lower share of inflows (12%) but grew significantly, up 28%, which could be explained by the greater confidence of foreign companies in the Brazilian market.

Capital inflows (excluding reinvested earnings) were mostly directed at the services sector (46%), once again highlighting the importance of this market's size. Of this, the largest share went to commercial activities (11% of the total) and to electricity, gas and water services (6%), while investment in telecommunications fell, after having led for several years. Meanwhile, the manufactures industry received a larger share of inflows in 2016, up to 38% of the total. The automotive industry has been growing as a recipient of FDI in recent years and was the largest recipient within manufactures in 2016 (up 45% compared with 2015). The chemical industry also attracted a substantial part of manufactures investment, as did machinery and equipment, while investments in the metallurgical industry recovered modestly, although 2016 values only represented 70% of annual FDI in the 2007-2012 period. In the primary sector, oil and natural gas extraction benefitted the most from foreign investment, while metals mining also recorded greater inflows.

As in previous years, one third of foreign capital invested in Brazil in 2016 (excluding reinvested earnings and loans) came from the Netherlands (20%) and Luxembourg (14%), making it difficult to identify the primary origin of these investments, as transnational companies attracted by the tax advantages use these markets to establish subsidiaries, and then invest in third markets. Putting these accounting difficulties aside, 50% of FDI came from the European Union, with the largest investments being made by Italy and the United Kingdom, while those from Germany, Spain and France declined. Outside Europe, the United States was the largest foreign investor in Brazil (12% of the total), although 2016 was the fourth year running in which investments from this country have fallen. As in 2015, Japanese investment also fell. In contrast, investments from China recovered in 2016 after dropping the year before, with the country once again positioning itself as one of the leading investors in Brazil, despite total investment figures not being fully captured by official statistics.

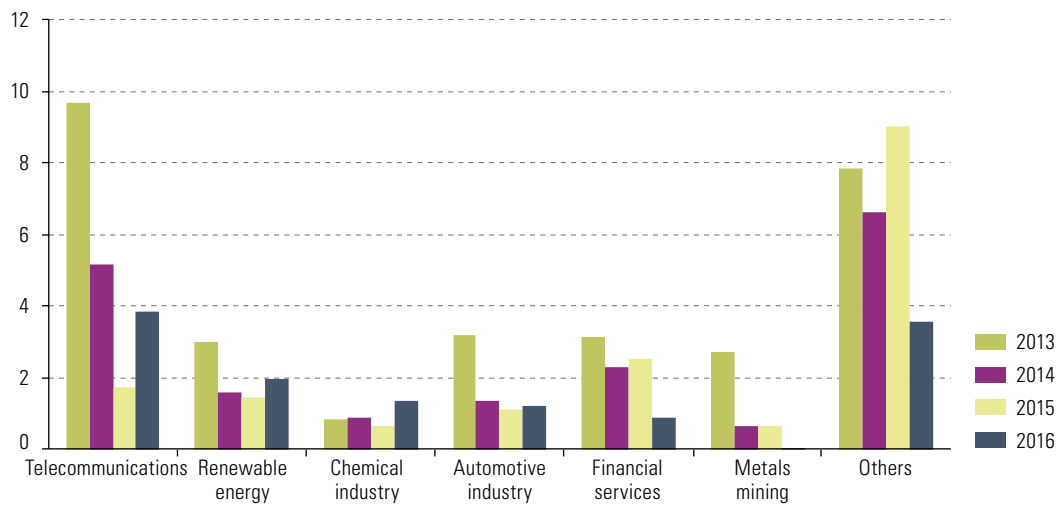
In fact, two of the largest cross-border acquisitions of 2016 were carried out by Chinese companies. China Molybdenum Co. Ltd. acquired the niobium and phosphate business units of British company Anglo American, for US$ 1.5 billion, thus becoming the second largest supplier of niobium worldwide and the second largest supplier of phosphate in Brazil, while China Three Gorges Corporation acquired Duke Energy Corporation's hydroelectricity plants, for US$ 1.2 billion, after the United States company decided to sell its Latin American business units in 2016. The Brazilian market is a priority for China Three Gorges Corporation's international expansion, as reflected in its 30-year concession —awarded in 2015— to operate the Jupiá and Ilha Solteira hydroelectricity plants, through which the firm consolidated its position as the second largest privately-owned energy company in Brazil. Smaller investments in other areas reflect a certain degree of diversification in the interests of Chinese companies in Brazil. For example, Hainan Airlines acquired a 23.7% stake in the Brazilian airline Azul, for US$ 450 million; Hunan Dakang International Food and Agriculture Co. Ltd. bought 57.6% of Friagril, a Brazilian grains trader, for US$ 200 million; and China Communications Construction Co. Ltd. took over the construction consultancy services provider Concremat Engenharia e Tecnologia, in a deal valued at US$ 106 million. Also, in keeping with China's strategy of expanding its presence abroad to provide services to Chinese companies operating in international markets, the Bank of Communications of China acquired an 80% stake in the Brazilian bank BMM, for US$ 155 million, in what was the first transatlantic acquisition by China's fifth largest commercial bank. This move is in addition to the launch of China Construction Bank's Brazilian operations, which began in 2014 after its acquisition of the Brazilian firm BicBanco.

The sheer size of the Brazilian market means that several business areas remain attractive despite the recession. For example, the United States group FLEETCOR, LCC acquired Serviços e Tecnologia de Pagamentos S.A. (known as Sem Parar), Brazil's largest electronic road toll payment firm, for US$ 1.089 billion. In the beverage sector, the Mexican Coca-Cola FEMSA bought the bottling and beverage distributor Vonpar Refrescos S.A., for US$ 1.029 billion, thus consolidating its position in Brazil, while the United States firm Coty Inc. took over the beauty and personal care division of Brazilian pharmacy Hypermarcas S.A., in a deal valued at US$ 985 million. In the financial sector, the largest operation involved a US$ 619 million acquisition by Colombian group Suramericana S.A. of the Latin American operations of British insurer Royal & Sun Alliance Insurance Group (RSA), as part of RSA's divestment in Latin America (including its subsidiaries in Argentina, Brazil, Chile, Colombia, Mexico and Uruguay). In the energy sector, through its subsidiary in Brazil, Italian company Enel was awarded privatization rights over electricity distributor Celg Distribuição in a deal worth US$ 647 million and in the light of which Brazil became Enel's third largest market —in terms of customer volume— after Italy and the Iberian peninsula.

Activity in the hydrocarbon sector was boosted by both Petrobras's divestment strategy and by the opening up of deepwater hydrocarbon extraction to foreign capital. At the close of 2016, Petrobras had reached asset sales agreements, in Brazil and abroad, totalling US$ 13.6 billion (90% of the target set in its 2015-2016 strategic plan). Among the most important was the disposal of a 66% stake in an exploratory block in the pre-salt fields of the Santos basin to Norwegian State-owned Statoil, valued at US$ 2.5 billion (of which US$ 1.25 billion were received in 2016).

Judging by greenfield announcements published in *fDi Markets*, it seems unlikely that FDI inflows to Brazil will increase substantially in 2017. In the last decade, there have been two distinctive periods of investment announcements in Brazil which have followed different trajectories: FDI grew consistently up to 2011, when it peaked at US$ 48 billion, and then began to fall, down to US$ 13 billion in 2016. With regard to large-scale projects —those that represent investment above US$ 100 million— only 36 were announced in 2016, in line with the 37 announcements made in 2015; yet in the period 2011-2013 87 projects were announced per year. Investments announced concerning the most important sectors also fell, although in 2016 there was an uptick in announcements in the telecommunications, renewable energy, automotives and chemical industries, four sectors that together accounted for close to 65% of the total (see figure I.24).

Figure I.24
Brazil: announced FDI projects by sector, 2013-2016
(Billions of dollars)



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

In telecommunications, there were announcements in the services and data centres segment by United States companies Equinix, Alphabet Inc. (Google), Level 3 Communications and 8x8, Inc., as well as investments by the Spanish firm Telefónica S.A. and Mexican América Móvil. Enel of Italy announced investments in wind energy, while the Spanish firm Elecnor and Norwegian Scatec Solar announced solar energy projects. In the automotive industry, activity revolved around expansion projects announced by General Motors, Volkswagen, Toyota Motor and Fiat Chrysler Automobiles, and the announcement of a new plant in 2018 by China's Zotye International Automobile

Trading Co. Ltd. In the chemical industry, the largest projects were in agrochemicals, including India's United Phosphorus Limited (UPL) announcement of a US$ 310 million investment to build a new plant, and the US$ 300 million project to expand the Brazilian subsidiary of United States firm Albaugh, LLC.

These sectors thus remain attractive for FDI in a context where others have not recovered, owing to either external factors —metals mining projects for example have been severely affected by falling commodity prices— or specific country or regional factors, such as the contraction of GDP or the uncertainty caused by corruption cases involving important companies in the country.

Official figures for May 2017 reflect an increase in FDI flows for the year, with continued large-scale acquisitions by Chinese companies, especially in the energy market. Inflows for the first five months of 2017 totalled US$ 32.456 billion, up 8.5% compared with the same period in 2016. In contrast with 2016, this increase can be explained by a rise in capital inflows. However, given that FDI flows are heavily influenced by large-scale transactions, this partial data point is insufficient to confirm that FDI will effectively grow in 2017.

2. The rest of South America has yet to recover

Colombia posted FDI growth of 15.9% in 2016, making it Latin America's third largest recipient of FDI, with inflows totalling US$ 13.593 billion. This improvement was mainly attributable to a large acquisition in the energy sector and to higher investment in services, although total investment remained below the levels seen during the commodities boom —between 2011 and 2014, Colombia received annual FDI inflows of US$ 15.5 billion. Capital inflows accounted for close to half of FDI (46%), but energy-related inflows failed to offset contraction in other areas, especially the oil and mining industries, resulting in a net decline of 15% compared with 2015. Conversely, intercompany lending, which accounted for 34% of total FDI, increased 133%, while reinvested earnings remained relatively flat compared with 2015 (falling just 2%), accounting for 20% of the total.

The fall in commodities prices modified the sectoral composition of investment in Colombia. The extraction industries suffered a significant decline, while investment in services increased. Between 2006 and 2014, one third of foreign capital that entered in Colombia was invested in the oil sector (33%), and about 20% went to mining (mainly coal). Investment in extractive industries has contracted sharply in the last two years. So much so that in 2016, oil accounted for 16% of the total, a 14% drop compared with 2015, while there was no investment in mining, in fact, there was a slight divestment. Conversely, electricity, gas and water received large investments, by virtue of which the sector accounted for 27% of total FDI in 2016. The privatization of the energy company ISAGEN was the largest transaction in the energy sector in 2016. The Canadian investment fund Brookfield Asset Management acquired the Colombian State's 57.61% stake and bought the remaining 42% of ISAGEN through other transactions, for a total investment of some US$ 3.5 billion. FDI in financial and business services also grew (22%), overtaking the oil sector (19% of total investment), as did FDI inflows for transport and communications (37%, reaching 8% of total investments). The manufactures sector remained one of the main recipients of FDI in Colombia (14% of the total), although it failed to sustain the upward trend it had maintained until 2014 and fell by 23%.

The main foreign investors increased FDI flows to Colombia. With the acquisition of ISAGEN, Canada positioned itself as one of the two largest investors in 2016, on a par with the United States (16% of the total). The European Union accounted for 29%

of the total, with most of the investment coming from Germany, Spain, France and the United Kingdom, although there was a decline in flows from Germany. However, investments from Latin America fell 9% in 2016, representing 18% of the total, with Panama as the main source, providing 10% of the total.

According to *fDi Markets*, announced investment remained at a similar level to that of 2015. There were only a few large-scale projects, with only 5 of 97 announcements in 2016 valued at over US$ 100 million, specifically the expansion of oil extraction activities, valued at US$ 660 million, by GeoPark, a Bahamas-based company that operates in several Latin American countries; two shopping centre investments by Chile's Parque Arauco and Cencosud, worth US$ 226 million and US$ 150 million, respectively; and investments in telecommunications by the United States firms Level 3 Communications and MVS USA, for a data centre project and a satellite telephone project, both worth around US$ 150 million.

Recent FDI trends are positive and, excluding the sale of ISAGEN, which was accounted for in the first quarter of 2016, by March 2017 FDI inflows had grown 8.1% year-on-year. The rebound in flows to the manufactures sector made it the leading recipient in the first quarter (28% of the total), overtaking the oil sector, which was relegated to second place (24%).

In 2016, FDI in **Chile** fell for the second year in a row and recorded its lowest level in 10 years after dropping by 40.3%, to US$ 12.225 billion. This was mainly due to the fall in intercompany lending —one of the most volatile components of FDI— which was down 72% and accounted for 23% of the total. Reinvested earnings fell slightly (5%) and accounted for 29% of total revenues, while capital contributions also declined, albeit at a slower pace (10%), and accounted for about half of total FDI flows.

Although at the time of publication information disaggregated by economic sector was not available, according to the report by the Central Bank of Chile, *Balanza de Pagos, Posición de Inversión Internacional y Deuda Externa Resultados al primer trimestre 2017* (2017), the largest recipients of FDI were mining, transport, and electricity, gas and water.

The trends in cross-border mergers and acquisitions confirmed the importance of the services and financial sector in a market that witnessed greater activity in 2016, with transactions valued at US$ 5.4 billion. The largest transaction was the purchase of the Autopista Central highway concession by Spain's Abertis from Canadian firm Alberta Investment Management Corporation (AIMCo), for US$ 1.028 billion, which allowed the Spanish company to gain control of the six concessions it has in Chile —its third largest market in terms of income, after Spain and France. The second largest was the sale of a 40.2% stake in the Chilean pension fund management firm AFP Habitat to the United States insurer Prudential Financial, Inc., for US$ 625 million. A similar figure (US$ 613 million) was paid by Qatar Airways for a 10% stake in the Chilean-Brazilian airline Latam Airlines Group S.A.

According to *fDi Markets*, investment announcements fell 36% in 2016, although their value was higher than in 2014. About a quarter of the projects announced in Chile involve investments of more than US$ 100 million, and announcements for this level of investment have remained relatively stable in the last decade, at around 18 per year (16 projects of this magnitude were announced in 2016). As in 2015, renewable energy was the most attractive sector for greenfield projects, accounting for 70% of announced investment values. In the energy sector, the Irish firm Mainstream Renewable Power will invest US$ 1.65 billion in new wind farms after it was awarded 20-year power purchase contracts to supply 3,366 GWh per year, allowing it to start providing energy to the Chilean grid from 2021 and 2022. The growth of renewable energies in the country has been driven by foreign investment, mainly from European companies —in the last 10 years, 73% of the value of announced investments in renewable energies in Chile

came from European firms. In 2016, France's EDF Energies Nouvelles announced wind and solar energy projects valued at US$ 600 million, while Germany's Anumar announced two solar energy projects worth US$ 515 million. In same year, the Brazilian company Latin America Power (LAP) announced investments totalling US$ 587 million in wind energy projects in southern Chile.

Mining —which up to 2012 represented close to half of announced investments in Chile— has fallen sharply in recent years, with projects accounting for only 11% of the total in 2016. However, Chilean mining resources continue to attract foreign capital, with the downturn in copper offset by growing interest in lithium. In 2016, Rockwood Holdings Inc., a subsidiary of the United States group Albemarle Corporation, announced it had earmarked US$ 500 million for the expansion of its lithium extraction activities in the Atacama desert, while BHP Billiton reported that it would expand its copper operations to the tune of US$ 200 million.

Chilean mining resources continue to attract foreign capital, with the downturn in copper offset by growing interest in lithium.

In telecommunications, several projects for the development of data centres and cloud services were announced in 2016. Investments in these types of projects may be smaller, but they are important because of the capabilities they require and the potential they offer to companies to broaden their range of services. The largest project was announced by Spain's Telefónica S.A., which will invest an estimated US$ 344 million to install a strategic data centre, which will allow it to offer local Open Cloud solutions. Other important milestones in 2016 were the web hosting and content project announced by Amazon Web Services, estimated to be worth US$4 million, and a project valued at US$ 1 million announced by Spain's Gigas Hosting S.A.

The increase in the number of such projects may not be reflected in the balance-of-payments, as they do not generally require large cross-border capital transfers. However, they are of great value in terms of both diversification and the country's inclusion in new production modes, where digital platforms and associated services play an increasingly pivotal role.

FDI flows into **Peru** dropped by 17% and totalled US$ 6.863 billion in 2016. The country has been unable to attain the maximum levels it saw in 2012, when inflows, mainly attracted by the mining industry, reached close to US$ 12 billion. Reinvested earnings grew 39% year-on-year and were the largest component of investment in 2016 (61% of the total). However, this increase could not offset the decline in the other components, which meant that the drop in 2016 was largely the result of lower capital inflows —down 47% and accounting for 32% of FDI— and, to a lesser extent, of lower intercompany lending, which fell 57% and accounted for 7% of FDI.

The volume of FDI that entered the country through cross-border mergers and acquisitions totalled some US$ 1.8 billion, similar to 2015 levels. The largest transaction in Peru was for a highway concession, with the French group VINCI purchasing Vía Expresa Línea Amarilla for US$ 1.66 billion. After falling to their lowest level in 10 years in 2015, investment announcements rebounded in 2016, with the highest values earmarked for transportation and logistics and renewable energies projects (33% and 25% of the total value of announcements, respectively). Dubai World, the maritime terminal operator based in the United Arab Emirates, is pursuing its investment plan in the port of Callao and announced investments in new logistics centres. Meanwhile, European companies won tenders for solar and wind energy projects, with investments announced by Italy's Enel, Spain's Grenergy Renovables and France's EnerSur (ENGIE Energía Perú).

The absence of major new projects in mining, a sector that in recent years attracted the greatest inflows of FDI to Peru, has had a negative impact on the inflow of new capital. However, in the first quarter of 2017, FDI inflows were up 61%, driven by increased reinvestment of earnings rather than the inflow of new capital.

In 2016, Argentina received FDI in the amount of US$ 4.229 billion, 64% less than in 2015, but this decline should be considered in the context of regulatory changes that were introduced in 2016. Up to the end of 2015, there were various restrictions on the repatriation of funds that tended to exaggerate FDI flows associated with reinvestment of earnings.

In 2016, **Argentina** received FDI in the amount of US$ 4.229 billion, 64% less than in 2015. However, this decline should be considered in the context of regulatory changes that were introduced in 2016. Up to the end of 2015, there were various restrictions on the repatriation of funds that tended to exaggerate FDI flows associated with reinvestment of earnings. The removal of these restrictions by the new government led to a fall in reinvestment of earnings in 2016. As a result of this relaxation of the rules, the debts incurred with parent companies and subsidiaries were also reduced. The lower level of reinvested earnings and the payment of debts to parent companies and subsidiaries more than compensated for new capital inflows, which increased significantly compared with the previous year (177%, totalling US$ 3.649 billion).

In contrast, the volume of cross-border mergers and acquisitions increased significantly from a total of less than US$ 200 million in 2015, to US$ 2 billion in 2016. After a number of disputes regarding the ownership structure of Telecom Argentina, the Mexican group Fintech Telecom LLC acquired a stake for US$ 849 million in 2016, granting it a controlling interest of 68%. Another major transaction in telecommunications was the acquisition of the free-to-air broadcaster Televisión Federal S.A. (Telefe) by the United States firm Viacom Inc. from Spain's Telefónica S.A., for US$ 345 million. With this purchase, Viacom Inc. plans to continue developing the content market, expanding into Argentina and other Spanish-speaking markets. Telefónica S.A. has stated that it remains committed to investing in the country and is looking to concentrate on improving connectivity for the digital society.

The FDI outlook could start to show positive results if the investments announced in 2016 actually materialize. The downward trend in the number and value of announced investments that had prevailed since 2012 was broken in 2016, with announcements hitting a record US$ 12 billion. Investments in the automotive industry, power plants, lithium production and telecommunications led the way with a 58% share of the total. Investment in the amount of US$ 2 billion was announced for the automotive industry, with expansion projects by General Motors, Fiat Chrysler, Nissan Motor Company and Grupo PSA worth between US$ 320 million and US$ 740 million. A call for tenders for fossil fuel concessions in the electricity sector led to announcements of worth US$ 1.5 billion, with the United States firms Stoneway Energy and APR Energy investing US$ 580 million and US$ 450 million, respectively, while Germany's Siemens AG will invest US$ 270 million. Argentina's energy infrastructure requires higher levels of investment and the flow of capital into the sector is expected to continue. In other areas, lithium production continues to attract foreign capital: Canada's Enirgi Group will expand its operations in Salta, with an investment of US$ 720 million, while the joint venture between the Canadian firm Lithium Americas and Chile's Sociedad Química y Minera de Chile S.A. (SQM) announced investments in Jujuy worth US$ 550 million (the Chinese group Ganfeng Lithium Co. Ltd., the largest integrated producer of lithium in China, acquired a stake in this joint venture in 2017). The South Korean steelmaker POSCO broke ground on a lithium plant in Salta, as part of a US$ 300 million project. Technological advances in telecommunications and new connectivity requirements boosted investments in all countries of the region. In Argentina, the largest broadband development projects were announced by Telefónica S.A. and América Móvil, in the amount of US$ 644 million and US$ 500 million, respectively, with total investments in the sector of US$ 1.1 billion. In consumer goods, Brazilian cosmetics company Natura plans to expand its operations with a US$ 460 million project, while the British firm Unilever is seeking to increase its installed capacity in Argentina with a US$ 360 million investment, and Dutch brewer Heineken, through its subsidiary Compañía Cervecerías Unidas (CCU), plans to invest US$ 300 million in a plant expansion project.

In 2016, **Uruguay** saw a drop in FDI levels for the third year in a row, down to US$ 953 million, 25.5% less than in 2015 and the lowest level seen since 2005. Reinvested earnings rose, but not enough to offset the fall in capital inflows and intercompany loans,

with the latter actually posting negative results. If only capital inflows and reinvested earnings are considered, FDI in 2016 was similar to levels in 2015 (2% less).

The services sector has been the main recipient of FDI flows (on average 61% of the total in the period 2014-2015, according to the latest available data by sector), while renewable energy has been an attractive sector for foreign capital. The value of investment announcements fell in 2016, with only one project valued at more than US$ 100 million, namely the wind farm construction project announced by Germany's ENERCON, valued at an estimated US$ 110 million. The second largest announcement was Hyatt's US$ 65 million hotel construction project, while the French group Virbac acquired all of Laboratorios Santa Elena, the leading manufacturer of vaccines, particularly for cattle, and announced plans to increase capacity in a project estimated to be worth US$ 51 million. The sale of Tienda Inglesa, an established national supermarket chain, to United States investment groups Goldman Sachs Group, Inc. and Klaff Realty, for US$ 140 million, was the largest transaction recorded in the year. Other smaller transactions were carried out in the renewable energy and casino sectors.

After reaching record levels in 2015, FDI in **Ecuador** fell 44% in 2016, returning to levels seen in previous years, with inflows standing at US$ 744 million. All FDI components decreased, but the biggest drop was in intercompany loans, which were negative.

The oil industry remains the leading recipient of foreign capital (64% of the total in 2016) and the drop in FDI was smallest in this sector (14%). Manufactures and services were hit the hardest, with declines of 86% and 57%, respectively. The European Union was the largest investor bloc, while the four leading countries were China, Spain, the United States and the Netherlands, which accounted for around 80% of the total. Investments from the Netherlands were up 30%, and accounted for about half of the total, but, as was noted above, the origin of much of the capital entering through the Netherlands cannot be identified. FDI flows from Spain also increased, while investments originating in China and the United States fell, with each of these three countries accounting for around 10% of total inflows.

Infrastructure development attracted large-scale projects. Dubai World, the maritime terminal operator based in the United Arab Emirates, was awarded the concession for Ecuador's first deepwater port in Posorja, a US$ 1.0 billion investment that will allow Ecuador to receive post-Panamax vessels. Other smaller manufactures projects will together represent investment of around US$ 200 million. These include the expansion of the German tyre manufacturer Continental AG, valued at US$ 74 million, and a new plant to be built by the Swiss construction materials company Sika AG, for an estimated US$ 64 million.

FDI in the **Plurinational State of Bolivia** fell by 26% in 2016 to US$ 410 million, the lowest level since 2007. Despite the slowdown in investment in extractive industries, the country's mineral wealth continues to attract foreign capital. Oil and gas exploration and development plans announced by a consortium made up of Spain's Repsol S.A. and Dutch-British Shell was the largest project announced in 2016 —US$ 500 million for the next five years—, followed by the construction of a steel plant by the Chinese company Sinosteel Corporation, with a planned investment of US$ 450 million. This project is currently in the final stage of the approval process required by the Export-Import Bank of China (EximBank) to provide financing.

Some Chilean companies operating in the country also announced expansions in 2016. The Coca-Cola Embonor S.A. franchise will expand its production capacity and infrastructure in its operations in the Plurinational State of Bolivia, with a project valued at US$ 35 million. In the telecommunications sector, Empresa Nacional de Telecomunicaciones S.A. (Entel) announced a project worth US$20 million to expand the optical fibre network.

Paraguay received US$ 274 million in FDI in 2016, a 5% increase compared with the previous year, 90% of which was new capital, a component that fell 10%. The total increase was attributable to reinvested earnings, which rose 65%. Intercompany loans registered negative values and were lower than the previous year.

Although data by sector are not available for 2016, in recent years the financial services sector has been the main recipient of FDI in Paraguay (54% between 2013 and 2015), followed by commerce, hotels and restaurants (25% in the same period), with most investments coming from Brazil and the United States.

Announced investments rose during 2016. Italian cement firm Financo, together with its subsidiary Colacem, announced one of the biggest projects, a new plant valued at US$ 200 million, which will supply Paraguay and central South America. In telecommunications, Swedish-based firm Millicom, operator of Tigo, announced plans to open a tier III data centre, which would require US$ 12 million of investment and will provide more advanced services for companies. In manufactures , the Brazilian meat processing company JBS S.A. opened its third processing plant —one of the most modern in Latin America— after investing US$ 80 million.

3. Mexico: end of the growth run?

FDI flows into Mexico in 2016 remained at historically high levels, totalling US$ 32.113 billion, despite falling 7.9% compared with 2015.[13] As a result, the country was the second largest foreign capital market in the region, after Brazil. With regard to FDI components, intercompany loans have grown steadily over the past five years (up 21.6% in 2016) and accounted for 42% of total investments. Capital inflows declined 19.8% and made up 33% of total FDI, while reinvested earnings fell for the third year in a row (23.9%), accounting for 25% of total inflows.

The Mexican manufactures sector has been the main recipient of foreign capital inflows to the country. Between 1999 and 2015, 48% of FDI went to manufactures, while in 2016 the figure reached 61%. The automotive industry is the most attractive, receiving 19% of FDI, followed by the chemical industry (14%) and beverages and tobacco (7%).[14] Once again, the United States was the largest investor in Mexico, with 39% of the total, although its share fell in relation to the figure for 2015 and the average for the period 1999-2016 (46%). Investments from the European Union accounted for 31% of the total, similar to that of 2015. Spain remained the most important European investor (11%) despite a fall in FDI outflows, while capital flows from Germany increased (9% of the total). Other major investors were Canada and Japan, both with a 6% share, while Brazil was the largest investor from Latin America and the Caribbean (3%).

The energy market reform undertaken in 2013 established the basis for a wholesale electricity market, allowing private companies to supply electricity and develop transmission and distribution infrastructure through contracts with the Federal Electricity Commission (CFE). It also established a target for Mexico to generate 35% of its electricity from clean energy sources by 2025 (Reyes, 2014). To carry out the investments linked to this reform, foreign capital will have to enter the country, the bulk of it in the immediate future. The first two auctions of electricity concessions took place in 2016, with contracts awarded to Mexican and foreign companies. Following the first auction, 18 contracts were awarded to 11 companies, while the second saw

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

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

56 contracts distributed among 23 companies, mostly in the field of solar photovoltaic energy, but also in wind energy. In 2016, US$ 1.131 billion was invested in electricity generation, more than double the amount of 2015 (for the period 1999-2016, annual investment in the sector averaged US$ 440 million). In telecommunications, although recent reforms had allowed new operators to enter the market and large investments were seen in 2015, FDI fell in 2016 to US$ 753 million, well below the annual average for the period 1999-2016 of US$ 1.03 billion.

Cross-border mergers and acquisitions activity was fairly muted in 2016, although two transactions exceeded the US$2 billion mark. The first was the acquisition of the Mexican laboratory Representaciones e Investigaciones Médicas, S.A. de C.V. by Teva Pharmaceutical Industries Ltd., the Israeli leader in generic pharmaceuticals, for US$ 2.3 billion. The deal led to a legal dispute between the seller and buyer which decided to close the plant. Although to date there is no indication that the problem was resolved, in April 2017 there was news of a possible resumption of operations in the coming months (Reuters, 2017). The second was the sale by Freeport-McMoRan Inc. of its oil assets in the Gulf of Mexico to Anadarko Petroleum Corporation, based in the United States, for US$ 2.0 billion, as part of its strategy to reduce debts and concentrate on metal mining, mainly copper. Thus, the only Freeport-McMoRan Inc. operations in Latin America are in Chile and Peru. A smaller but still noteworthy transaction was the acquisition for US$315 million of Grupo Productos Internacionales Mabe, a leading Mexican manufacturer of disposable hygiene products for babies, women and adults, by the Belgian Ontex Group N.V., which is seeking to consolidate its global presence with an Americas division.

Investment announcements published by *fDi Markets* kept a healthy pace in 2016, with 50 projects over the US$ 100 million mark, in line with the annual average of the last ten years and 14% higher than in 2015. Despite the fact that the total value of announced investments for the automotive industry fell, the sector attracted some 20% of the total (in number and value). Unlike previous years, there were no big announcements, although there were announcements of smaller-scale projects (less than US$ 500 million) by companies based in Mexico to expand existing operations and build new facilities. The largest project in manufactures was the construction of a new brewery in Mexicali by the United States-based Constellation Brands, worth an estimated US$ 1.5 billion and which is expected to start production in 2019.

The energy market was particularly active, with a quarter of the total value of investments announced in 2016 earmarked for energy projects. Renewable energy, mainly solar, accounted for most of the amount. The Italian firm Enel and the Spanish companies ACCIONA, Fisterra Energy, Grenergy Renovables and Iberdrola accounted for 61% of the total announced, followed by the Chinese firms Envision Energy and Jinko Solar, with 15%. The hydrocarbon projects announced included the construction of a liquefied natural gas plant in Yucatán by Korea Gas Corporation (KOGAS), based in the Republic of Korea, which will require an estimated investment of between US$ 1 billion and US$ 1.5 billion, and the expansion of TransCanada's investment portfolio. In 2016, the Canadian firm was awarded two 25-year contracts for the construction and operation of gas pipelines, one for the Tula-Villa de Reyes pipeline as the sole investor (US$ 550 million) and another for the South Texas-Tuxpan pipeline in partnership with the Mexican firm IEnova (US$ 2.1 billion).

The energy market was particularly active, with a quarter of the total value of investments announced in 2016 earmarked for energy projects. Renewable energy, mainly solar, accounted for most of the amount.

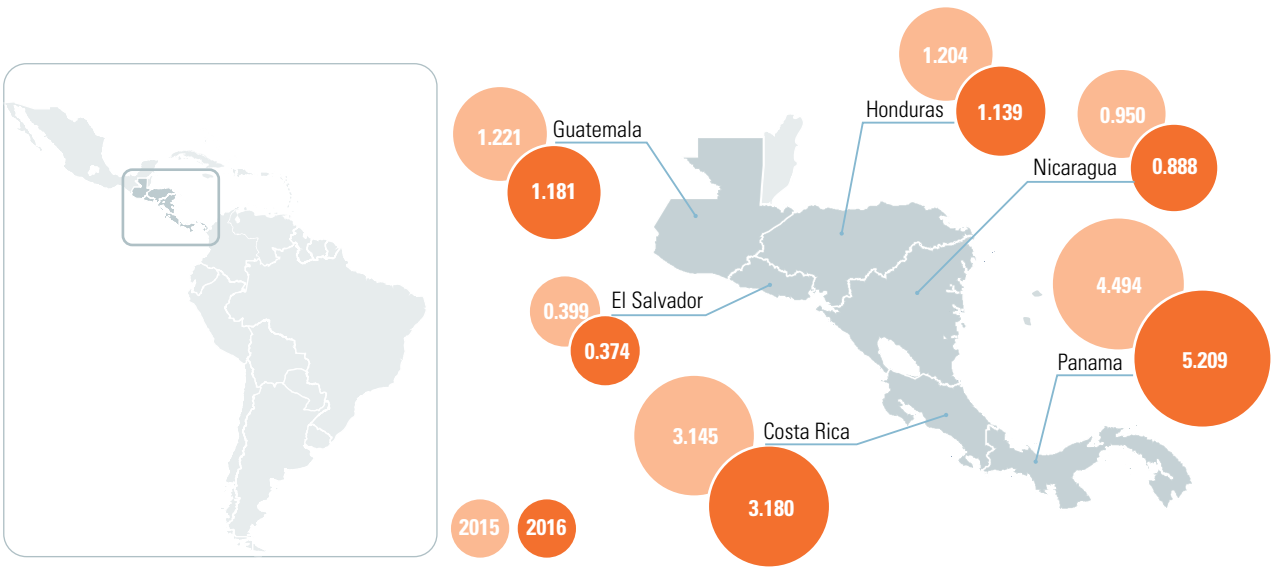
Telecommunications operators expressed their continued interest in investing during 2016, making the sector the fifth-largest recipient of announced investments, despite a drop in the total value compared with 2015. The United States operator AT&T reported that it would continue to pursue its investment plan to consolidate its position in the Mexican market, as did Spain's Telefónica S.A., which announced that it would

continue to invest in mobile telephony. Investments in telecommunications are expected to rise in the next few years, as a result of the Red Compartida project, a public-private partnership that seeks to increase coverage of advanced 4G LTE services and is expected to generate more than US$ 7 billion in investment over the next 20 years, which was put out to tender in 2017.—The winning bid was made by Altán Redes, a multinational consortium whose strategic partner is the Spanish Groupo Multitel and whose main investor is North Haven Infrastructure Partners II, an infrastructure fund managed by Morgan Stanley Infrastructure, and which comprises other international investment funds and Mexican partners. In April 2017, this consortium completed the US$ 2.3 billion financing process: 33% in the form of capital contributions by the partners, 37% in the form of loans from technology suppliers (China's Huawei and Finland's Nokia) and the remaining 30% will be provided by national development banks (the National Bank for Public Works and Services, Nacional Financiera and the National Foreign Trade Bank).

4. Central America: Panama performs well

FDI to Central America grew 4.9% in 2016 and stood at US$ 11.971 billion. Higher investments in the subregion's two main recipients —Panama, which received 44%, and Costa Rica, with 27%— offset the drop in FDI to the other Central American countries.

Map I.2
Central America (selected countries): foreign direct investment inflows, 2015 and 2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of preliminary figures and official estimates at 15 June 2017.

FDI flows to **Panama** rose 15.9% to US$ 5.209 billion in 2016, a record after four consecutive years of increases, following the upward trend that began in the mid-2000s. This level of investment placed Panama in sixth place in terms of FDI inflows for the whole of Latin America and the Caribbean, behind Peru. Reinvested earnings were the largest component of FDI in Panama, with 66% of the total, and the amount was just 2% higher than that seen in 2015. Intercompany loans made up 19% of FDI, down 7%, while capital inflows accounted for 15% of the total, making it the smallest component of FDI for the fourth year running.

No sectoral data are available for 2016, but based on past performance, investment in Panama is clearly concentrated in the services sector, which received 91% of inflows on average between 2013 and 2015, primarily in the areas of commerce, financial services, telecommunications and media, and transport. In 2015, the most recent year for which data by origin are available, the United States and Colombia were the main sources of investment in Panama, accounting for 23% and 19%, respectively, followed by the European Union, with 13%, and South Africa, with 7%.

According to data compiled by *fDi Markets*, the number of greenfield renewable energy projects in Panama declined in 2016, with the Taiwanese firm General Energy Solutions making the only announcement, with plans for a photovoltaic power plant. Meanwhile, in the area of natural gas-fired electricity generation, the United States-based multinational AES Corporation —with operations in Panama through two subsidiaries spanning almost 20 years— broke ground on a natural gas-fired power plant, the first of its kind in Central America, a project that will require investment in the amount of US$ 1.15 billion, to be made in conjunction with the Panama-based Inversiones Bahía.

The expansion of the Panama Canal was completed in 2016 and the country is moving forward with a national strategy to improve its logistics position, seizing the opportunities offered by the port area. In line with the national maritime strategy, the Panamanian Maritime Authority has promoted a plan for the strategic development of the sector by 2040, which includes building a terminal for cruise liners on the Pacific side and a dock for related maritime industries, first on the Pacific side and later on the Atlantic side of the Canal. These tender processes will attract transnational companies and could potentially boost FDI inflows into the country, especially from Chinese companies looking to establish a greater presence in Central America through these bidding processes. Construction of the Panama Colon Container Port began in June 2017 —the first with the capacity to serve neopanamax vessels— after Chinese firm Shanghai Gorgeous Investment Development Co. Ltd. was awarded the concession. The associated investments will reach US$ 900 million, with the building work to be carried out by China Communications Construction Co. Ltd. In addition to the port, Shanghai Gorgeous Investment Development Co. Ltd. announced plans to build a natural gas-fired power plant, a project valued at US$ 900 million which is still awaiting environmental approval.

FDI flows to Panama rose to US$ 5.209 billion in 2016, a record after four consecutive years of increases.

Costa Rica was the second largest recipient of FDI in the subregion, with inflows totalling US$ 3.18 billion, up 1.1%. FDI to the country had been on a clear upward trend until 2013, after which it stabilized at around US$ 3 billion annually. Intercompany loans and reinvested earnings accounted for 80% of investments (42% and 38%, respectively) and increased compared with 2015, while capital inflows fell for the fourth year in succession, down 4%, accounting for 20%.

Information by sector is only available for 2015, but this shows that services, manufactures and real estate were the main recipients of FDI in Costa Rica, with 29%, 28% and 11% of the total, respectively. The share of manufactures and services is similar to the average levels of the last decade, but the real estate share contracted compared with its past performance (23% of FDI in 2005-2015).[15] The United States, which accounted for half the FDI inflows in 2015, remains the largest investor in Costa Rica. The European Union had a 28% share, with the Netherlands accounting for the lion's share (17%)—which, as was mentioned above, makes it difficult to identify the exact origin of the funds— followed by Germany and Spain, with 4% each. Latin America accounted for 17% of FDI inflows to Costa Rica, led by Colombia (5%) and Mexico (4%).

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

In the energy sector, Globeleq Mesoamerica Energy —which began its Costa Rican operations in 1996 with a 23 MW wind farm and which by the end of 2016 had an operational capacity footprint of 394 MW in wind and solar energy, and has projects in Costa Rica, Honduras and Nicaragua— was taken over by Guatemala's Corporación Multi Inversiones (CMI), which thus consolidated its position in the Central American renewable energy market, which it entered in the mid-2000s. The subregion currently has an installed generating capacity of 711 MW from hydraulic, wind and solar energy plants, with plans to add 135 MW of capacity. In the financial sector, a major transaction was the acquisition of a 70% stake in Instacredit, a holding company that grants loans to the low and medium-low income segments of the population and has 52 branches in Costa Rica, 8 in Panama and 1 in Nicaragua, by the Mexican firm Crédito Real in a deal valued at US$ 70 million.

A similar number of investment announcements were made in 2016 as in 2015, albeit for smaller-scale projects —none were valued above US$ 100 million— which is in line with investors' focus on services, an area where projects tend to be comparatively less capital intensive. Most of the project announcements published by *fDi Markets* in 2016 were concentrated in software and information technology (IT) services and the medical industry. One of the largest projects was the opening of a new manufacturing plant for orthopaedic sports medicine supplies in the Coyol free zone by the British company Smith & Nephew, for an estimated US$ 55 million. Also in the area of medical services, Precision Coating, a supplier of plastic coating solutions for medical devices based in the United States, announced a US$ 21 million project in Coyol to supply the local market, while Edwards Lifesciences, also based in the United States, will build a plant to manufacture cardiac valve components for export, with an initial investment of US$ 10 million in the La Lima free zone.

FDI into **Guatemala** totalled US$ 1.181 billion in 2016, down 3.3% from 2015. It was the second consecutive year of contraction, although the value remains above the average of the 2000s. Reinvested earnings were the largest component (91%), up 12% compared with the previous year, so the contraction is the result of lower capital inflows and intercompany loans, which accounted for 8% and 1% of the total, respectively.

The commerce sector attracted 26% of FDI in 2016, the value of which grew 76% compared with 2015. Investments in electricity fell, but it was still the second largest sector, receiving 22% of the total, while FDI flows to manufactures (19% of the total) and telecommunications(13% of the total) grew 11% and 39%, respectively. Once again, the United States was the principal investor in the country, accounting for 34% of the total in 2016. The European Union accounted for 13%, with most of those investments originating in Spain (6%) and Luxembourg (5%), followed by Colombia, with 9%, and Mexico, 7%. Of those leading investors, only Colombia saw a drop in its outflows to Guatemala. Canadian investments, which had boomed between 2010 and 2014, also fell.

One of the biggest projects announced was the construction of an oil refinery by the United States-based Maple Resources Corporation, for an estimated value of US$ 88 million. In the logistics sector, the Danish company A.P. Moller-Maersk will invest US$ 80 million to expand its container terminal in Puerto Quetzal, while the largest project in manufactures was the expansion of the maize flour production plant of the Mexican company GRUMA, one of the world's leading producers of maize flour and tortillas, estimated at US$ 47 million.

FDI flows into **Honduras** fell 5.3% to US$ 1.139 billion in 2016. Despite this and the fact that it was the second consecutive year of contraction, total FDI was still higher than the income received by Honduras in the 2000s. Reinvested earnings were the largest component of investment, with 86%, and rose by 17%, while capital inflows accounted for 18% of the total, up 47% compared with 2015.

Investment in financial services has grown steadily over the past three years and accounted for 40% of FDI in 2016. The telecommunications and manufactures sectors also received a significant share of foreign capital, 24% and 22%, respectively, up slightly compared with 2015. Investments in commerce fell by 8%, accounting for 11% of the total, while the share of FDI received by the maquila sector fell from 18% over the past decade to 3% in 2016. The origin of investment was relatively diverse compared with other countries of the region. Despite a drop in its outflows to Honduras, Panama was the main investor (15% of the total). The United States and Mexico invested more in Honduras, with each accounting for 14% of the total, while Colombia, Guatemala and Luxembourg accounted for 12%, with only FDI outflows from Colombia decreasing.

In telecommunications, the Swedish firm Millicom, owner of the Tigo brand, announced that it would expand its 4G network to reach 33% of the population in 2016, a project valued at US$ 220 million. The United States textile firm Nike, which has seven factories in Honduras, announced the opening of a logistics centre in the north of the country, a project worth US$ 40 million. Textiles, together with tourism, agribusiness, business support services, intermediate manufacturing (spare parts) and housing, has been a priority area for the proposed strategy to attract investment as part of the Honduras 20/20 development plan, launched in 2016, which aims to secure 70% of the investment needed to fulfil its goals from foreign sources.

Although investment inflows to **Nicaragua** fell by 6.5% in 2016, total FDI was US$ 888 million, higher than the average for the 2000s. Manufactures and telecommunications remained the main recipients of foreign capital in 2016, with 31% and 26% of the total, and values were similar to those of 2015 (manufactures investment values dropped 2% and telecommunications rose 2%). Investment in commerce and services fell by 7%, accounting for 16% of the total, while the energy sector made up 14% of total FDI, with a small increase of 3%. Mining investments have been falling steadily over the past three years to reach negative territory in 2016, down from an average 18% share of the total between 2011 and 2013.

According to *fDi Markets*, fewer projects were announced in 2016. Major manufactures projects included the opening of a new plant by the Japanese auto parts manufacturer Yazaki Corporation, which already has five factories in Nicaragua, a project valued at US$ 27 million, and the new shrimp feed processing plant project, valued at US$ 10 million, announced by the United States transnational company Cargill. Next Level Apparel, a textile company based in the United States, opened a storage and distribution centre to supply companies in Nicaragua and the United States, in a project with associated investments in the amount of US$ 10 million. In the financial sector, Banco de la Producción, a subsidiary of the Panamanian Promerica Financial Corporation, expanded its activities in the country by opening new branches.

El Salvador received US$ 374 million of FDI in 2016, 6.2% less than the previous year. However, this decline was rather unusual because capital inflows increased in 2016, up to US$ 457 million, meaning that the contraction in total FDI was due to the decrease in intercompany lending, which was negative in 2016.

Analysis of sectoral trends shows that investment in manufactures accounted for 79% of the total, with a similar value to that of 2015 (up 1.2%). Within the services sector, which accounted for the rest of the inflows, investments in the financial sector, the main recipient, increased, investments in commerce dropped and there were divestments in communications and electricity. The leading investors were Panama, which doubled its level of investment compared to 2015 and accounted for 59% of the total, the United States, with a 20% share despite a 71% decline in investments, and Honduras, with 12% of the total.

Investment announcements increased in 2016, with projects concentrated in telecommunications and renewable energy. Spain's Telefónica S.A., which trades as Movistar in El Salvador, announced an investment of US$ 250 million to roll out its LTE network. The Swedish firm Millicom, owner of the Tigo brand, expanded its mobile and 4G networks, with investments estimated at US$ 100 million and US$ 200 million, respectively. In the renewable energy sector, Neoen, a subsidiary of France's Direct Energie, broke ground for a 100 MW photovoltaic power plant, which will be the largest in the country. In the financial sector, Banco Agrícola, a subsidiary of the Colombian concern Grupo Bancolombia, will invest US$ 55 million in a new operations centre.

5. The Dominican Republic still leads in the Caribbean

Foreign direct investment to the Caribbean increased by 3.3% in 2016 and totalled US$ 4.878 billion. The largest recipient of investment was the Dominican Republic, which accounted for 49% of total FDI into the subregion, followed by Jamaica, with 16%. The countries of the Organisation of Eastern Caribbean States (OECS) together received 11% of total FDI in 2016.

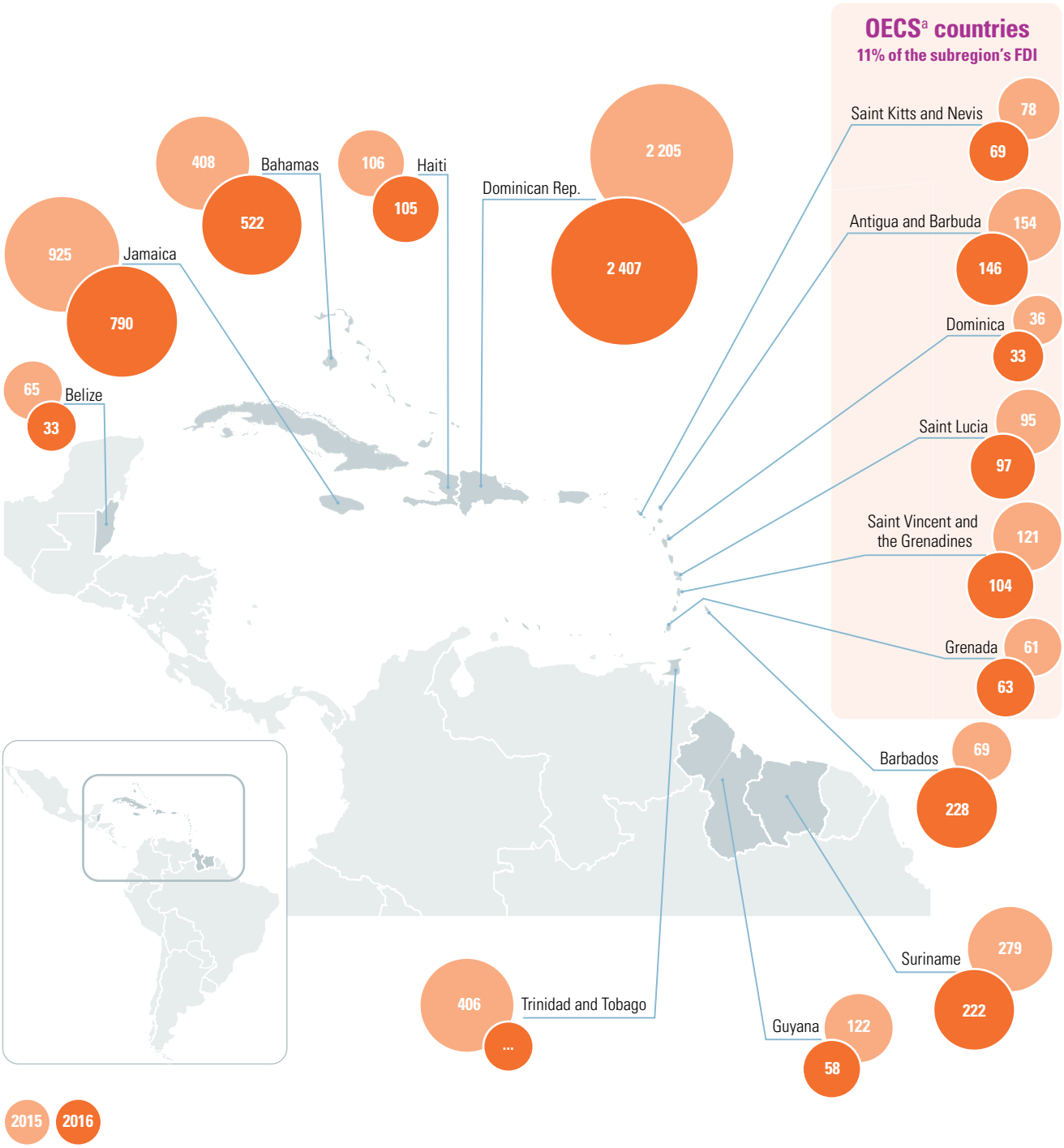
FDI flows to the **Dominican Republic** have been trending upwards for the past decade. In 2016 they increased by 9.2% to US$ 2.407 billion, making the country the ninth largest recipient of FDI in Latin America and the Caribbean. More than half of FDI took the form of reinvested earnings (55%), while new capital inflows represented 40%, a similar level to that of 2015, down just 0.6%. Tourism and real estate accounted for more than half of the investments, with 33% and 24%, respectively, while after three years of sharp falls, investments in mining and commerce and industry picked up, accounting for 17% and 13% of the total, respectively.

Canada and the United States were once again the two main sources of FDI, with 20% and 15% of the total in 2016, even though investments from the United States contracted by 12%. The European Union was responsible for 17%, of which the largest investor was Spain (12% of the total), while Mexico was the largest contributor from Latin America and the Caribbean, with 5%.

The tourism sector continues to develop and attracted fresh FDI (a rise of 17%), with Spanish companies announcing numerous projects in Punta Cana. For example, Riu Hotels & Resorts invested US$ 140 million in a new five-star hotel for adults only with 1,007 rooms and 3 million euros in its first water park. Another Spanish company, Grupo Piñero, invested an estimated US$ 103 million in a new luxury hotel also in Punta Cana, making it the group with the most hotels in the Dominican Republic.

While FDI inflows for telecommunications and energy were quite modest in 2016, there have been several advances and investment announcements in these sectors, which could boost investment in the future. In 2016, work began on the first phase of the Monte Plata Solar plant, the first large-scale solar power plant in the Dominican Republic, led by General Energy Solutions, based in Taiwan province of China, and Soventix of Germany , with an investment of US$ 110 million. In the first phase of the project, 132,000 solar panels will be set up and generation capacity will be 30 MW, to be expanded to 60 MW in the second phase. The German firm F&S Solar announced that it will build two 107 MW and 115 MW solar parks, which will require an estimated investment of US$ 225 million. In telecommunications, in line with its investment plans for 2015-2017, Mexico's América Móvil, through Claro República Dominicana, announced that it will invest US$ 265 million to expand its 4G LTE network and fibre optic services. The Dutch company Altice, which operates in the Dominican Republic under its Orange and Tricom brands, announced a project to build an entrepreneurship and innovation centre, with an estimated investment of US$ 67 million.

Map I.3
The Caribbean (selected countries and groupings): foreign direct investment inflows, 2015 and 2016
(Millions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of preliminary figures and official estimates at 15 June 2017.
[a] Organisation of Eastern Caribbean States.

FDI flows to the Dominican Republic have been trending upwards for the past decade. Tourism and real estate accounted for more than half of the investments.

Transnational companies have also expressed interest in other production and business services sectors. In the agrifood sector, Kılıç Holding, a Turkish firm specializing in aquaculture and fisheries, is examining the possibility of producing fish for export, with investment of US$ 200 million. Australia's Acquire Business Process Outsourcing (Acquire BPO), which specializes in business services, announced the opening of a contact centre in the Dominican Republic, with an investment of US$ 30 million, while the Italian firm Ritrama, specialists in self-adhesive materials, continues to expand its operations in the region and opened a slitting and distribution centre in the Dominican Republic to service the whole Caribbean subregion, with an estimated investment of US$ 29 million.

FDI inflows to **Jamaica** fell by 14.5% to US$ 790 million, with most going to tourism, a sector that the government expects will grow by at least 5% per year. The United States-based group, Karisma Hotels, announced that it would begin building the first of three hotels in the Sugar Cane megaproject, an initiative first announced in 2015 (Jamaica Observer, 2016a), while the Spanish group, Riu Hotels & Resorts, will invest US$ 60 million in the construction of its sixth hotel in Jamaica; hotel Riu Reggae will be a five-star, adults only hotel with 454 rooms.

The renewable energy sector has also attracted foreign capital. Jamaica's National Energy Policy, 2009-2030, states that the country will seek to increase investments and establishes a goal of 20% of renewable energy in the energy mix by 2030. In 2016, a 36 MW wind farm, a project valued at US$ 90 million, was opened to the west of Kingston. The farm was acquired later that year by British investor Sir Richard Branson, making it the largest private renewable energy project in Jamaica (*Jamaica Observer*, 2016b). In addition, the United States biofuel company, Benchmark Renewable Energy, announced a project for a large-scale bioethanol plant, with an annual production capacity of 10 million gallons and an additional 3 MW of electricity for the local grid, which will require investment to the tune of US$ 95 million. In the same area, the German fund MPC Capital AG will invest US$ 50 million in a photovoltaic power plant at Paradise Park, which is being developed by Eight Rivers Energy Company (comprised of the French firm Neoen, which is the majority shareholder, and the Jamaican company Rekamniar Frontier Ventures) (MPC Capital, 2016).

The business services market continues to develop thanks to foreign investors and in 2016 India's Hinduja Global Solutions (HGS) announced the opening of its fourth customer service centre in Kingston, a project valued at US$ 100 million. Jamaica has 7.3% of the world's bauxite reserves (ECLAC, 2016a) and, in a transaction valued at US$ 229 million, the Chinese firm Jiuguan Iron & Steel Co. Ltd. (JISCO) purchased the vertically-integrated Alpart aluminium refinery —which has been inactive since 2009— from the Russian company UC RUSAL. Reopening and improving the plant will require an initial investment of US$ 220 million and JISCO has also announced that it will invest some US$ 2 billion over the next four years to create an industrial zone (*Jamaica Observer*, 2016c).

FDI inflows to the **Bahamas** were up 27.8% to US$ 522 million in 2016, but that is still below the average for the last decade.[16] Capital inflows accounted for a lower share of FDI (37%) and almost doubled their 2015 level.

In October 2016, Hurricane Matthew hit the Bahamas directly, causing severe damage to infrastructure and property, as well as power outages and floods. The material costs of that disaster together with those incurred following Hurricane Joaquin, which preceded Matthew, are estimated at US$ 800 million (Bahamas Information Services, 2016). Most of the FDI that comes to the Bahamas goes to the tourism sector, which

[16] The statistics from the Central Bank of the Bahamas are not fully comparable with those of other countries. In this document, FDI data represent the sum of two items on the financial account: direct investment and other private flows.

is the key to rebuilding and boosting the economy. In 2016, work began on the first phase of the controversial Baha Mar hotel megaproject, which was acquired by CTF BM Holdings Ltd., a subsidiary of the conglomerate Chow Tai Fook Enterprises Ltd. based in Hong Kong SAR. This venture is expected to kick start the local economy (*New York Times*, 2017).

The cruise business continues to thrive, with companies announcing expansion plans. MSC Cruises, a company founded in Italy and with headquarters in Switzerland, announced a project for a private island, Ocean Cay MSC Marine Reserve, in which it plans to invest US$ 200 million, while the United States-based Norwegian Cruise Line will invest to improve its private island in the Bahamas, Great Stirrup Cay. Meanwhile, Carnival Cruise Line, the other major United States cruise line, is planning to build a new port on the east side of Grand Bahama, with an investment estimated at between US$ 100 million and US$ 200 million.

Barbados received US$ 228 million of FDI in 2016, which is triple the amount received in 2015, but still below the average for the last decade. In telecommunications, the Jamaican Digicel Group announced an infrastructure expansion project valued at US$ 84 million, which is expected to extend access to the fibre optic network to households. As part of the same project, it also launched its 4G LTE mobile telephone network, the first of its kind in the country.

In the area of tourism, the Jamaican firm Sandals Barbados plans to double the size of the hotel complex it opened in 2015, by adding another 222 rooms, while United States-based group Hyatt announced the construction of a hotel on Lower Bay Street that will have 232 rooms and 30 condominiums, with an estimated investment of US$ 100 million. In 2017, work will finally begin on the long-delayed, US$ 200 million project to build a 450 room hotel on the site of historic Sam Lord's Castle Hotel in Saint Philip, to be operated by the United States-based firm Wyndham Grand Resort. As it is linked to a transnational company, this project is expected to receive investment from abroad, which would boost FDI inflows, but in the meantime, the bulk of the funding will be provided by the Government of Barbados directly. In this particular case, Barbados has secured a loan from the Government of China to finance construction of the hotel, which will be built by China National Complete Plant Import & Export Co. Ltd. (*Barbados Today*, 2017).

FDI in **Suriname** fell 20.4% to US$ 222 million. However, 2015 saw the highest reported amount of investment of the last 10 years, so inflows in 2016 were still above the average of previous years. The country's natural resources have been the main attraction for foreign capital. In mining, the Canadian firm Iamgold signed an agreement with the Government of Suriname to acquire a stake in the Saramacca project and the encouraging results of the initial explorations mean that drilling will continue (Iamgold, 2017). In 2016, production began at the Merian open-pit gold mine, a project led by the United States-based group Newmont Mining Corporation and in which the State-owned oil company, Staatsolie, holds a 25% stake. This site has an estimated mine life of 11-13 years and reserves of approximately 3.8 million ounces. Annual production is expected to reach between 400,000 and 500,000 ounces in the first five years of operation.

FDI flows to **Haiti** remained relatively stable, reaching US$ 105 million in 2016, despite being a year marked by political turmoil and the trail of destruction wreaked by Hurricane Matthew, with the ensuing damages estimated to be in the region of 21% of GDP.

The maquila industry, particularly in the textile sector, has seen some activity. MAS Holdings, a Sri Lankan conglomerate specializing in the manufacture of underwear, announced the opening of a new plant in the Caracol industrial park, with an estimated

investment of US$ 27 million. This project would make it the second foreign investor in the park, following in the wake of SAE-A Trading Co. Ltd., the global leader in textiles based in the Republic of Korea, which has been operating in the industrial park since 2012. Meanwhile Winds Group of Hong Kong SAR has opened a new sportswear factory where 12 million garments will be manufactured for mid-range brands in the United States, and announced that it will open a second plant in 2018 to double its production capacity. Both projects are expected to require investment totalling US$ 90 million.

Although the government continues to pursue its efforts to promote Haiti as a tourist destination and improve the quality and range of services, the tourism sector and the country's image have been hurt in 2016 by the political instability surrounding the presidential elections and the damage caused by Hurricane Matthew. The government has tried to promote the mining sector, whose potential value is estimated at US$ 20 billion in gold and precious metals, by establishing a new legal framework that allows exploitation by foreign companies. However, this is a controversial issue, as establishing a framework that ensures sustainable mining activities that contribute to development is a complex task for the industry, and civil society continues to voice concerns about the lack of assurances in this regard (*Huffington Post*, 2016).

Guyana received US$ 58 million of FDI in 2016, close to half the value of investment received in 2015 (a decrease 52.3%) and of average inflows received during the first half of the 2000s. The energy sector received the lion's share of FDI (34%) and more capital than in 2015, followed by the mining sector, 26% of the total, despite a 58% decrease. Investment in tourism, manufactures and agriculture was also down.

Hydrocarbon exploitation is expected to effect major changes in the country's economy in the coming years. Exploration of the Stabroek block by United States-based ExxonMobil yielded positive results and in June 2017 the company announced that it will begin the first phase of exploitation, which is expected to cost US$ 4.4 billion and develop approximately 450 million barrels of oil.

FDI in **Belize** decreased by 49.7% in 2016, to US$ 33 million. With this second consecutive year of decline FDI reached levels similar to those of the 2000s. Capital inflows were the largest FDI component, accounting for 58%, and their contraction could not be offset by the increase in reinvested earnings.

Services and natural resources have attracted much of the investment in previous years. In the agriculture sector, the Guatemalan company Santander Group completed the construction of a sugar mill and exported the first sugar shipment to Europe, while in the tourism sector, Norwegian Cruise Line launched a project which will see at least 130 cruise ships visit Belize every year, generating 500 direct jobs and 1,500 indirect jobs by 2020 (*Cruise Industry News*, 2016).

In the first half of 2016, **Trinidad and Tobago** saw negative FDI flows of US$ 30 million, after reaching US$ 406 million in 2015.[17] The capital outflows of transnational oil companies explains why FDI was negative in the first two months, while FDI totalled US$ 177 million in the other sectors in the first six months of 2016. In the past, hydrocarbon exploitation and petrochemicals have been the main recipients of FDI, meaning that movements by transnational companies have a major impact on the balance of payments and FDI inflows may be negative in some years.

In the financial sector, National Commercial Bank Jamaica Ltd. acquired a 29.9% stake in the insurance and financial services firm Guardian Holdings Ltd., a leader in

[17] In 2017, the Central Bank of Trinidad and Tobago adopted the methodology set out in the *Balance of Payments and International Investment Position Manual, sixth edition* (BPM6) of the International Monetary Fund (IMF, 2009) and modified part of the data sources, as a result only information for the first half of 2016 was available at the time of writing the present report.

financial transactions in the Caribbean, while in telecommunications, the Jamaican company Digicel Group remains active in the market and announced a project in 2016, estimated at US$ 305 million, to expand its fibre optic network to households.

FDI flows to member countries of the Organisation of Eastern Caribbean States (OECS) fell for the third year in a row, coming in at US$ 513 million in 2016, 5.8% less than in 2015.

Antigua and Barbuda received inflows totalling US$ 146 million, which is in line with the average for the last five years, even though it fell 5.2%. Capital income accounted for 93% of FDI and was the main factor behind the contraction, as reinvested earnings and intercompany loans increased. FDI flows have been concentrated in tourism and most investment projects were announced in that sector.

After being announced in 2015, the construction of the Hideaway at Royalton Antigua Resort & Spa in Deep Bay by Canada's Sunwing Travel Group was finally approved in 2016, with total investments estimated at US$ 400 million. In Barbuda, the Paradise Found project, led by Robert De Niro, also received the necessary construction permits, despite opposition from local residents. This US$ 250 million project aims to upgrade and redevelop the site of the former K Club, which was once frequented by Princess Diana and closed its doors more than a decade ago (Forbes, 2016a). The boutique division of the United States chain Marriott announced the construction of Coconut Bay Beach Resort, its first hotel in the country, a project that will require a US$ 40 million investment and will consist of 40 luxury condominiums and a 70-room five-star hotel.

Saint Vincent and the Grenadines received FDI totalling US$ 104 million in 2016, down 14% on 2015 but still within the range of investment received by the country in the past decade. Almost all of the investment came in the form of new capital (97%) and went to the tourism sector. In 2016, the real estate firm Sotheby's International Realty began operating in the country, which is expected to boost the real estate market. In hotels, a three-year, US$ 100 million luxury tourism project was also announced. In 2016, work began on the first phase of the Pink Sands Club, an exclusive hotel complex with 26 rooms and 6 villas (Forbes, 2016b). In addition, a new international airport was opened in February 2017, with Air Canada announcing in May that it would start weekly flights from Toronto by the end of the year. This will be the first regular international service to the islands from North America and is expected to boost tourism.

Saint Lucia received US$ 97 million in FDI in 2016, up 2.2% on 2015 and in line with inflows seen in the last four years. The increase was due to higher capital inflows, accounting for 76% of the total, and reinvested earnings and intercompany loans (12% of the total each). Tourism is the main economic activity in Saint Lucia. The Jamaican chain Sandals announced the construction of its fourth property in the country: a six-star luxury resort with 350 rooms, which will require an estimated investment of US$ 65 million. Luxury tourism is one the country's major attractions, and in 2016 Serenity at Coconut Bay, a luxury all-inclusive-boutique resort, was opened, and a project to build 20 villas in the south of the island —the Domaine Resort Development Project—was also announced, requiring investment of around US$ 6 million. Saint Lucia launched its citizenship by investment programme in early 2016, and will expand it in 2017 by eliminating the minimum net worth requirement of US$ 3 million.

FDI flows to member countries of the Organisation of Eastern Caribbean States (OECS) fell for the third year in a row, coming in at US$ 513 million in 2016, 5.8% less than in 2015.

FDI in **Saint Kitts and Nevis** fell for the third year in a row in 2016, amounting to US$ 69 million, down 11.7% on 2015. Of this total , 97% was new capital. The government has implemented several reforms to its citizenship by investment programme in recent years, mainly to preserve the credibility of the programme and of the passport, as well as other changes to facilitate the process of including family members in the application. As in other Caribbean islands, tourism has been the main attraction for foreign capital.

The United States-based Wyndham Hotel Group sees the country as one of the most desirable and exclusive destinations in the Caribbean, and will begin operations with a complex of 170 suites, condominiums and villas. The investment in this venture, due to be complete in 2019, is estimated at US$ 160 million.

Among OECS countries, the largest increase in FDI was in **Grenada**, which rose 4.6% to US$ 63 million, 91% of which corresponded to capital income and the remaining 9% to reinvested earnings. The tourism sector has been growing since 2014, when the JetBlue service began operating and Sandals opened a resort. In 2016, JetBlue increased the number of direct flights from New York. In line with this growth, new tourism projects were announced. Construction began on the Levera Beach Resort, a 176-room hotel located on the least developed north-east coast of the island, a project that was green lighted as part of the country's citizenship by investment programme. Plans were also announced for a new 146-room hotel to be developed by True Blue Development and operated by the United States boutique hotel chain Kimpton Hotels & Restaurants, a subsidiary of Intercontinental Hotels Group. The hotel will open in 2019.

FDI in **Dominica** declined 6.9% to US$ 33 million, owing to lower capital inflows, accounting for 77% of the total, while reinvested earnings and intercompany loans remained steady (12% of the total each). Since its introduction in 2014, the citizenship by investment programme has been Dominica's main source of FDI and was indispensible for the reconstruction effort following Tropical Storm Erika. As part of this programme, hotel projects by Kempkinski and Hilton were given the go-ahead and are scheduled to open in 2018. Another real estate project approved as part of the citizenship for investment programme is the announcement by the international chain Marriott, already present in the Dominican market thanks to its acquisition of Silver Beach Resort & Spa Dominica, that it will open a boutique hotel, part of its Autograph Collection brand.

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Annex I.A1

Table I.A1.1

Latin America and the Caribbean: inward foreign direct investment by country, 2002-2016
(Millions of dollars)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Antigua and Barbuda	80	179	95	238	361	341	161	85	101	68	138	101	155	154	146
Argentina	2 149	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	4 229
Bahamas	354	713	804	1 054	1 492	1 623	1 512	646	1 097	1 409	1 034	1 133	1 599	408	522
Barbados	228	185	228	390	342	476	615	255	446	458	548	56	559	69	228
Belize	25	-11	111	127	109	143	170	109	97	95	189	95	153	65	33
Bolivia (Plurinational State of)	677	197	85	-288	281	366	513	423	643	859	1 060	1 750	657	555	410
Brazil[a]	16 587	10 123	18 161	15 460	19 418	44 579	50 716	31 481	88 452	101 158	86 607	69 181	96 895	74 694	78 929
Chile[b]	2 550	4 059	6 848	7 526	7 659	13 563	18 627	13 966	16 153	24 374	30 562	21 092	24 011	20 469	12 225
Colombia[a]	2 134	1 720	3 116	10 235	6 751	8 886	10 565	8 035	6 430	14 648	15 039	16 209	16 163	11 732	13 593
Costa Rica[c]	659	575	794	861	1 469	1 896	2 078	1 615	1 907	2 733	2 696	3 205	3 195	3 145	3 180
Dominica	21	32	27	32	29	48	57	58	43	35	59	25	35	36	33
Dominican Republic[d]	917	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
Ecuador	783	872	837	493	271	194	1 057	309	166	644	568	727	772	1 322	744
El Salvador[a]	496	123	366	398	267	1 455	824	366	-226	218	484	176	311	399	374
Grenada	57	91	66	73	96	172	141	104	64	45	34	114	38	61	63
Guatemala[e]	205	263	296	508	592	745	754	600	806	1 026	1 245	1 295	1 389	1 221	1 181
Guyana	44	26	30	77	102	152	178	164	198	247	294	214	255	122	58
Haiti	6	14	6	26	161	75	29	55	178	119	156	161	99	106	105
Honduras	275	403	547	600	669	928	1 006	509	969	1 014	1 059	1 060	1 417	1 204	1 139
Jamaica[f]	481	721	602	682	882	866	1 437	541	228	218	413	545	582	925	790
Mexico[g]	24 055	18 225	24 916	26 018	20 701	33 058	32 150	19 451	21 035	23 792	17 101	46 597	29 296	34 878	32 113
Nicaragua[g]	204	201	250	241	287	382	627	434	490	936	768	816	884	950	888
Panama[h]	78	771	1 012	1 027	2 498	1 777	2 402	1 259	2 363	3 132	2 980	3 943	4 459	4 494	5 209
Paraguay	6	25	28	36	114	202	263	71	462	581	697	252	382	260	274
Peru	2 156	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
Saint Kitts and Nevis	81	78	63	104	115	141	184	136	119	112	110	139	120	78	69
Saint Lucia	57	112	81	82	238	277	166	152	127	100	78	95	93	95	97
Saint Vincent and the Grenadines	34	55	66	41	110	121	159	111	97	86	115	160	110	121	104
Suriname	-74	-76	-37	28	-163	-247	-231	-93	-248	70	174	188	164	279	222
Trinidad and Tobago[i]	791	808	998	940	883	830	2 801	709	549	55	-1 849	-1 134	672	406	...
Uruguay	194	416	332	847	1 493	1 329	2 106	1 529	2 289	2 504	2 536	3 032	2 188	1 279	953
Venezuela (Bolivarian Republic of)[j]	782	2 040	1 483	2 589	-508	3 288	2 627	-983	1 574	5 740	5 973	2 680	320	1 383	...

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 15 June 2017.

[a] The data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.

[b] From 2003 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.

[c] From 2009 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.

[d] From 2010 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.

[e] From 2008 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.

[f] From 2012 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.

[g] From 2006 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.

[h] From 2015 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.

[i] From 2011 to 2015 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.

[j] The 2015 data correspond to the first three quarters only.

Table I.A1.2
Latin America and the Caribbean: inward foreign direct investment by destination sector, 2007-2016
(Millions of dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Argentina[a]										
Natural resources	2 464	2 627	1 600	2 544	1 222	2 816	5 631	4 000	-740	...
Manufactures	3 020	5 144	474	4 861	5 446	5 709	4 295	6 947	7 979	...
Services	1 961	2 426	2 220	2 622	4 567	4 787	3 924	5 775	6 044	...
Belize										
Natural resources	9	37	7	13	29	100	22	10	12	22
Manufactures	0	0	0	0	0	0	0	0	0	0
Services	101	117	93	79	59	90	64	113	40	5
Other	34	16	9	5	5	6	9	9	13	6
Bolivia (Plurinational State of)[b]										
Natural resources	486	859	420	530	622	1 166	1 550	1 558	869	...
Manufactures	164	154	74	274	240	119	317	390	23	...
Services	303	290	193	132	171	220	162	164	168	...
Brazil[c]										
Natural resources	4 751	12 995	4 597	16 261	10 297	6 528	9 990	5 621	8 310	8 696
Manufactures	13 481	14 013	13 481	21 273	26 837	22 206	15 218	16 922	20 967	20 138
Services	16 103	17 449	13 601	14 702	31 987	31 444	23 880	33 357	28 628	24 647
Chile										
Natural resources	6 495	4 599	7 772	5 216	18 222	13 881	4 304	4 370	10 681	...
Manufactures	-657	1 570	441	637	942	2 602	1 454	1 648	424	...
Services	6 481	8 725	4 113	6 838	4 876	8 999	8 911	11 620	4 401	...
Other	215	256	1 065	2 818	-732	3011	4 694	4 704	4 952	...
Colombia										
Natural resources	4 452	5 176	5 672	4 976	7 336	7 970	8 385	6 517	3 257	2 319
Manufactures	1 760	1 696	1 364	210	1214	1985	2481	2 837	2 471	1 914
Services	2 673	3 693	1 000	1 244	6 098	5 084	5 343	6 810	6 005	9 360
Costa Rica										
Natural resources	33	467	73	31	38	-15	-9	97	442	...
Manufactures	689	555	407	966	737	600	382	503	799	...
Services	1 170	1 031	845	446	1 401	1 674	2 717	2 148	1 609	...
Other	4	26	22	23	2	0	0	0	0	...
Dominican Republic										...
Natural resources	30	357	758	240	1 060	1 169	93	-39	6	418
Manufactures	184	574	280	566	355	1 257	404	607	368	320
Services	1 453	1 938	1 128	1 218	862	716	1 494	1 640	1 831	1 669
Ecuador										
Natural resources	-77	265	58	189	380	243	274	725	628	521
Manufactures	99	198	118	120	122	136	138	108	264	37
Services	173	595	133	-143	143	189	316	-60	430	186
El Salvador										
Natural resources	109	31	9	1	-1	-3	6	1	1	1
Manufactures	23	28	92	-65	149	-47	285	88	292	296
Services	1 315	479	243	-225	66	502	-147	245	77	83
Other (maquila)	103	365	21	59	4	29	35	-23	28	-6
Guatemala										
Natural resources	70	174	139	120	325	418	335	201	156	49
Manufactures	210	175	51	299	150	145	186	179	205	228
Services	437	369	401	363	544	636	707	951	759	818
Other	28	36	9	23	7	46	67	58	101	86

Table I.A1.2 (concluded)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Honduras										
Natural resources	30	4	10	84	62	41	70	72	65	10
Manufactures	384	267	98	341	392	438	325	667	395	237
Services	513	736	402	545	560	579	665	678	744	756
Other	0	0	0	0	0	0	0	0	0	0
Mexico[d]										
Natural resources	1 931	4 604	1 502	1 498	988	3 217	5 776	2 687	1 263	1 347
Manufactures	13 670	9 111	7 227	14 280	10 947	9 143	30 694	16 576	16 310	16 401
Services	16 855	15 666	9 382	11 485	12 771	8 701	11 066	8 245	15 608	8 990
Nicaragua										
Natural resources	11	57	47	77	191	123	272	109	32	-19
Manufactures	121	122	70	108	226	302	234	246	280	275
Services	250	447	318	323	550	347	350	378	501	499
Other	0	0	0	0	0	22	125	151	137	134
Panama										
Natural resources	-59	-59	-34	77	94	1 164	468	-18	11	...
Manufactures	161	161	104	-114	298	520	142	181	238	...
Services	2 106	2 106	1 190	2 760	2 761	1 526	2 957	4 296	4 245	...
Other	-11	-11	0	0	0	0	0	0	0	...
Paraguay										
Natural resources	-2	7	7	-1	20	34	45	83	-25	...
Manufactures	8	201	-33	302	210	409	-30	-12	100	...
Services	196	55	98	160	351	254	237	311	185	...
Uruguay										
Natural resources	338	604	253	329	383	220	378	136	124	...
Manufactures	263	261	242	131	190	340	240	290	70	...
Services	592	1 003	962	1 010	1 360	1 536	1 642	1 274	824	...
Other	136	238	71	820	572	440	772	487	261	...

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 15 June 2017.

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

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

[c] Based on capital inflow data only.

[d] Figures according to the *Balance of Payments and International Investment Position Manual*, fifth edition (BPM5).

Table I.A1.3
Latin America and the Caribbean: inward foreign direct investment by country of origin, 2007-2016
(Millions of dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Argentina[a]										
United States	870	2 720	1 862	2 168	2 945	3 623	3 726	5 668	3 899	...
Spain	1 191	-2 652	1 296	1 349	-154	-907	1 643	1 737	2 697	...
Netherlands	616	1 074	-97	108	481	2 362	2 060	2 595	1 405	...
Brazil	828	1 421	-71	1 654	2 054	1 634	755	610	1 140	...
France	833	351	51	202	184	531	649	1 058	879	...
Chile	438	751	240	589	586	649	85	666	856	...
Germany	301	298	384	701	217	687	1 049	862	706	...
Uruguay	427	614	519	-47	-152	470	-127	266	463	...
Bolivia (Plurinational State of)[b]										
Spain	50	25	145	271	246	364	676	537	310	...
France	13	36	22	89	55	73	220	200	185	...
United Kingdom	24	48	70	11	2	111	309	442	142	...
Sweden	242	339	23	169	280	178	347	15	79	...
United States	322	295	162	85	76	89	61	140	79	...
Brazil[c]										
Netherlands	8 129	4 639	6 515	6 702	17 582	12 213	10 511	8 791	11 573	10 524
Luxembourg	2 857	5 937	537	8 819	1 867	5 965	5 067	6 659	6 599	7 395
United States	6 073	7 047	4 902	6 144	8 909	12 310	9 024	8 580	6 866	6 544
United Kingdom	1 053	693	1 032	1 030	2 749	1 978	1 203	1 726	1 649	3 596
Spain	2 202	3 851	3 424	1 524	8 593	2 523	2 246	5 962	6 570	3 489
Italy	313	385	232	300	457	986	902	868	1 720	2 835
France	1 233	2 880	2 141	3 479	3 086	2 155	1 489	2 945	2 841	2 778
Norway	284	207	671	1 540	1 073	936	405	554	2 445	2 186
Chile										
Spain	0	0	1 886	1 529	2 087	144	3 951	5 452	1 642	...
United States	0	0	469	2 902	4 749	8 162	335	1 823	1 543	...
Netherlands	0	0	763	2 962	2 746	4 573	5 025	2 034	1 362	...
Bahamas	0	0	-65	1 160	361	204	19	562	658	...
Bermuda	0	0	1 014	128	1 152	1 478	288	-2 144	540	...
Colombia										
Canada	159	145	116	268	273	291	258	437	322	2 194
United States	2 697	2 874	2 343	1 593	2 155	2 476	2 839	2 238	2 031	2 140
Spain	572	1 040	830	113	1164	628	884	2 214	1 332	1 527
Bermuda	82	404	645	624	924	367	848	1 017	1 292	1 520
Panama	839	1 141	789	1 368	3 508	2 395	2 040	2 436	1 660	1 387
Netherlands	-660	60	197	1	1 072	-1 792	632	450	945	1 028
Costa Rica										
United States	962	1 328	1 022	1 036	1 376	1 015	1 392	1 182	1 503	...
Netherlands	51	24	27	7	30	32	109	-59	471	...
Honduras	1	5	3	13	7	1	18	3	171	...
Colombia	30	50	6	98	152	106	79	109	141	...
Mexico	71	20	7	40	183	336	172	237	123	...
Spain	57	141	79	28	247	311	247	291	120	...
Dominican Republic										
Canada	113	383	773	696	1 126	851	143	158	91	480
United States	536	360	455	1 055	499	252	374	321	405	356
Spain	605	181	151	203	137	128	33	7	32	281
Mexico	-124	1 055	273	433	73	-32	6	244	-19	118
Italy	32	11	16	8	16	1	0	10	-1	48
Ecuador										
Netherlands	8	-8	-4	11	7	11	48	76	293	383
Spain	85	190	51	-16	52	50	71	67	71	100
United States	50	-29	-607	-535	12	94	42	10	186	87
China	85	47	56	45	80	86	94	79	114	72
Italy	11	17	1	10	25	27	61	27	25	42
United Kingdom	5	6	6	5	15	19	1	25	21	34
El Salvador										
Panama	841	321	80	206	27	-480	323	2	120	221
United States	499	129	74	-124	23	6	-72	111	260	76
Honduras	0	0	0	-4	0	47	-1	8	-14	46

Table I.A1.3 (concluded)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Guatemala										
United States	326	229	151	343	127	227	221	441	385	404
Colombia	3	15	21	22	155	48	155	142	164	108
Mexico	76	76	50	97	81	96	143	105	60	79
Spain	42	66	64	50	2	49	74	43	62	72
Luxembourg	37	37	21	6	0	0	25	39	47	54
Switzerland	13	22	6	43	4	29	19	25	15	37
Republic of Korea	13	4	23	63	38	35	48	34	33	34
Honduras										
Panama	22	16	1	14	16	22	63	152	195	150
United States	460	449	92	185	141	173	128	-256	137	139
Mexico	92	30	168	124	154	192	266	140	134	138
Colombia	0	0	0	0	20	22	31	128	127	121
Guatemala	15	44	14	61	44	52	37	88	65	121
Luxembourg	0	0	171	133	149	124	150	133	92	120
Mexico[d]										
United States	13 157	11 929	7 615	7 298	12 722	10 180	15 003	8 930	17 242	10 410
Spain	5 493	5 034	3 042	4 211	3 693	-400	329	4 459	3 409	2 856
Germany	649	710	22	457	561	994	1 693	1 689	1 451	2 395
Israel	2	2	2	28	6	114	8	9	1	2 015
Canada	886	3 485	1 805	2 043	1 474	1 838	4 479	3 021	1 190	1 672
Japan	452	554	366	1 074	929	1 829	1 961	1 425	1 734	1 522
Belgium	228	142	346	40	179	21	13 254	1 292	842	1 088
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	612	1 039	...
Ecuador	9	20	-4	9	13	533	305	912	866	...
South Africa	13	19	26	879	191	612	246	199	320	...
Mexico	60	69	154	-9	171	-51	367	297	225	...
Switzerland	146	122	301	444	216	152	232	184	188	...
Spain	77	91	327	-50	133	68	147	191	165	...
United Kingdom	208	6	68	114	486	-701	78	154	156	...
Paraguay										
United States	107	216	35	332	240	86	-98	62	104	...
Brazil	41	2	22	108	84	169	73	170	101	...
Panama	26	-13	-1	25	20	11	13	22	77	...
Uruguay	2	2	4	9	-3	9	7	-1	34	...
Spain	19	16	24	35	22	94	19	11	30	...
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										
Argentina	373	534	432	588	809	975	672	616	366	...
Germany	16	4	0	15	12	18	36	-1	144	...
Brazil	86	183	110	108	170	178	255	253	105	...
Italy	0	4	0	2	0	2	20	-1	100	...
Belgium	46	-2	53	55	51	59	64	51	84	...
Canada	3	3	0	14	18	66	7	12	60	...

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 15 June 2017.

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

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

[c] Based on capital inflow data only.

[d] Figures according to the *Balance of Payments and International Investment Position Manual*, fifth edition (BPM5).

Table I.A1.4
Latin America and the Caribbean: inward foreign direct investment by component, 2007-2016
(Millions of dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
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	2 578	4 552	2 133	2 504	4 508	4 861	2 784	-112	1 319	3 649
Intercompany loans	1 846	4 777	-1 010	3 507	2 600	3 120	-783	-945	2 382	-3 747
Reinvested earnings	2 050	396	2 894	5 322	3 732	7 343	7 821	6 121	8 058	4 327
Bahamas										
Capital contributions	887	1 032	753	960	971	575	410	374	104	194
Intercompany loans	736	481	-107	137	438	458	723	1225	304	328
Reinvested earnings	0	0	0	0	0	0	0	0	0	0
Barbados										
Capital contributions	420	340	140	393	227	230	118	307	398	274
Intercompany loans	24	231	103	41	324	113	-119	-76	-216	-137
Reinvested earnings	32	45	13	13	-93	206	56	329	-112	91
Belize										
Capital contributions	100	141	80	80	103	193	101	145	57	19
Intercompany loans	13	8	6	2	1	0	0	0	0	0
Reinvested earnings	30	21	23	15	-8	-4	-6	7	7	14
Bolivia (Plurinational State of)[a]										
Capital contributions	27	45	1	1	5	19	17	313	20	406
Intercompany loans	654	850	177	141	130	282	331	889	741	470
Reinvested earnings	272	407	509	793	899	1204	1682	919	405	208
Brazil										
Capital contributions	26 074	30 064	19 906	40 117	54 782	52 836	41 648	47 220	49 495	44 884
Intercompany loans	18 505	20 652	11 575	13 470	16 451	22 541	38 346	38 977	18 053	24 908
Reinvested earnings	0	0	0	34 865	29 925	11 230	-10 813	10 698	7 145	9 137
Chile										
Capital contributions	2 622	7 775	1 905	4 662	10 921	8 532	4 806	10 524	6 612	5 936
Intercompany loans	661	1 869	763	3 318	3 155	10 949	8 598	8 807	10 177	2 804
Reinvested earnings	10 280	8 983	11 298	8 174	10 297	11 080	7 689	4 681	3 680	3 485
Colombia										
Capital contributions	7 024	7 861	4 907	3 741	8 282	9 088	9 749	9 176	7 353	6 224
Intercompany loans	-121	47	731	-635	1 872	1 239	2 368	2 493	2 006	4 675
Reinvested earnings	1 983	2 657	2 396	3 325	4 494	4 712	4 091	4 495	2 373	2 694
Costa Rica										
Capital contributions	1 377	1 594	1 050	818	959	852	1 704	1 333	967	641
Intercompany loans	-2	39	-174	150	711	1 136	714	912	1 078	1 345
Reinvested earnings	521	446	471	497	509	708	788	949	1 100	1 193
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	870	883	983	623	778	972	967
Intercompany loans	-446	278	1 096	351	389	1 177	81	11	40	121
Reinvested earnings	498	394	365	803	1 005	982	1 286	1 420	1 192	1 319
Ecuador										
Capital contributions	151	229	278	265	252	227	424	848	985	679
Intercompany loans	-368	530	-225	-312	65	40	-7	-390	50	-146
Reinvested earnings	411	298	256	213	328	301	310	314	287	211

Table I.A1.4 (concluded)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
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	198	94	265	198	446	208	138	712	91
Intercompany loans	-30	75	19	-102	58	219	416	431	-452	14
Reinvested earnings	515	482	488	643	770	580	672	820	961	1 076
Honduras										
Capital contributions	220	568	84	29	284	310	174	248	137	201
Intercompany loans	203	-40	65	378	56	52	240	253	229	-42
Reinvested earnings	505	479	360	562	674	697	645	917	838	981
Mexico										
Capital contributions	18 097	12 989	11 468	15 869	9 551	4 640	22 450	5 815	13 099	10 512
Intercompany loans	6 458	9 876	2 648	-40	4 096	2 586	7 213	7 925	11 041	13 430
Reinvested earnings	8 504	9 285	5 335	5 205	10 146	9 875	16 934	15 556	10 738	8 171
Panama										
Capital contributions	719	918	898	948	759	1 561	1 614	687	77	781
Intercompany loans	178	136	105	540	1 224	682	550	343	1 035	966
Reinvested earnings	879	1 348	257	874	1 150	737	1 779	3 429	3 382	3 463
Paraguay										
Capital contributions	43	66	152	93	399	421	355	386	277	249
Intercompany loans	129	73	-58	149	316	40	-325	-197	-57	-42
Reinvested earnings	31	124	-23	220	-134	236	222	193	41	67
Peru										
Capital contributions	733	2 981	1 828	2 445	896	5 393	2 490	-1 786	4 170	2 213
Intercompany loans	924	656	-782	693	2 117	-508	3 202	2 705	1 105	477
Reinvested earnings	3 835	3 287	5 385	5 317	4 328	6 903	4 107	3 522	2 997	4 172
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	530	-196	-1 904	528	...	...
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	1 665	1 866	2 267	1 012	806
Intercompany loans	448	540	82	8	263	94	306	-527	81	-222
Reinvested earnings	331	554	457	664	828	777	860	448	186	369
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	...	...

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 15 June 2017.

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

Table I.A1.5
Latin America and the Caribbean: inward foreign direct investment stock by country, 2001-2016
(Millions of dollars and percentages of GDP)

	2001	2005	2011	2012	2013	2014	2015	2016	2001	2005	2011	2012	2013	2014	2015	2016
Argentina	79 504	55 139	93 199	100 821	91 557	100 821	91 557	82 399	27	27	18	17	15	18	14	15
Bolivia (Plurinational State of)	5 893	4 905	7 749	8 809	10 558	11 785	11 633	11 504	72	51	32	33	34	36	35	34
Brazil	121 949	181 344	695 505	742 144	741 436	738 874	597 539	763 749	22	20	27	30	30	30	33	43
Chile	0	79 138	179 375	211 793	220 175	231 576	238 194	255 647	0	63	71	79	79	89	98	103
Colombia	15 377	36 987	97 364	112 926	128 191	141 783	149 157	164 249	16	25	29	31	34	37	51	58
Costa Rica	3 600	7 510	19 353	22 302	26 271	30 079	33 761	37 407	21	37	46	48	53	59	62	65
Dominican Republic	...	...	21 740	25 143	26 660	29 035	31 309	33 820	...	...	38	41	43	45	46	47
Ecuador	6 876	9 861	12 502	13 070	13 797	14 569	15 891	16 635	28	24	16	15	15	14	16	17
El Salvador	2 252	4 167	8 120	8 918	9 341	10 025	10 025	10 307	16	24	35	37	38	40	38	38
Guatemala	0	3 319	7 751	8 938	10 255	11 977	13 189	14 575	0	12	16	18	19	20	21	21
Haiti	99	150	744	900	1 061	1 160	1 265	1 370	3	4	10	12	13	13	15	18
Honduras	1 585	2 870	7 965	9 024	10 084	11 501	12 704	13 844	21	29	45	50	55	60	63	68
Jamaica	3 931	6 918	11 705	12 119	12 664	13 246	14 171	14 961	43	62	81	82	89	95	101	111
Mexico	156 583	211 235	388 802	385 545	455 397	480 873	486 931	509 292	23	24	33	33	36	37	42	49
Nicaragua	1 565	2 461	5 617	6 385	7 200	8 084	9 034	9 922	29	39	58	61	66	69	71	75
Panama	7 314	10 167	23 875	26 762	30 677	35 135	39 629	44 839	59	62	69	67	68	71	76	81
Paraguay	1 016	1 127	3 877	5 288	5 077	5 439	4 411	4 685	13	13	15	21	18	18	16	17
Peru	11 835	15 889	50 317	62 105	71 905	76 346	84 618	91 480	23	21	29	32	36	38	45	48
Suriname	...	...	859	1 035	1 232	1 397	1 676	...	...	...	19	21	24	27	33	...
Uruguay	2 406	2 844	15 147	17 407	19 564	21 240	...	...	12	16	32	34	34	37	...	...
Venezuela (Bolivarian Republic of)	39 074	44 518	40 206	40 180	33 018	30 139	...	...	32	31	13	11	9	6	...	...

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 15 June 2017.

Table I.A1.6
Latin America and the Caribbean: outward foreign direct investment flows by country, 2001-2016
(Millions of dollars)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Antigua and Barbuda	13	14	13	15	17	2	2	2	4	5	3	4	6	6	6	6
Argentina	161	-627	774	676	1 311	2 439	1 504	1 391	712	965	1 488	1 055	890	1 921	875	1 787
Bahamas	94	40	72	169	143	333	459	410	217	150	524	132	277	397	158	359
Barbados	26	25	25	54	157	44	82	73	27	343	558	41	39	-213	141	-11
Belize	0	0	0	0	1	1	1	3	0	1	1	1	1	3	0	2
Bolivia (Plurinational State of)	3	3	3	3	3	3	4	5	-4	-29	0	77	-255	-33	-2	15
Brazil[a]	-1 489	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	7 815
Chile[b]	0	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	16 742	7 125
Colombia[a]	16	857	938	192	4 796	1 268	1 279	3 085	3 505	5 483	8 420	-606	7 652	3 899	4 218	4 516
Costa Rica[c]	68	132	152	206	150	219	430	197	274	318	405	894	804	424	459	496
Dominica	4	1	0	1	13	3	7	0	1	1	0	0	2	2	2	2
El Salvador[a]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grenada	2	3	1	1	3	6	16	6	1	3	3	3	1	1	1	1
Guatemala[d]	0	0	0	0	0	0	0	16	26	24	17	39	34	106	117	111
Honduras	3	7	12	-6	1	1	2	-1	4	-1	2	208	68	103	91	260
Jamaica[e]	89	74	116	60	101	85	115	76	61	58	75	3	-86	-2	4	226
Mexico[f]	4 404	891	1 253	4 432	6 474	5 312	8 858	3 913	10 928	8 910	11 856	18 908	11 609	8 530	12 301	3 657
Paraguay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peru	74	0	60	0	0	0	66	736	411	266	147	78	137	801	127	303
Saint Kitts and Nevis	2	1	2	7	11	4	6	6	5	3	2	2	2	2	2	3
Saint Lucia	4	5	5	5	4	4	6	5	6	5	4	4	3	3	3	3
Saint Vincent and the Grenadines	0	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	0	3	-1	0	0	0	0
Trinidad and Tobago[g]	58	106	225	25	341	370	0	700	0	0	67	189	63	-18	153	…
Uruguay	-6	-14	-15	-18	-36	1	-89	11	-16	60	7	3	-5	-39	13	4
Venezuela (Bolivarian Republic of)[h]	204	1 026	1 318	619	1 167	1 524	-495	1 311	2 630	2 492	-370	4 294	752	1 024	-1 112	…

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of estimates and official figures as at 15 June 2017.
[a] The data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.
[b] From 2003 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.
[c] From 2009 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.
[d] From 2008 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.
[e] From 2012 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.
[f] From 2006 to 2016 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.
[g] From 2011 to 2015 the data are standardized according to the methodology of the sixth edition of the IMF Balance of Payments Manual.
[h] The 2015 data correspond to the first three quarters only.

CHAPTER II

Disruptive change in a leading sector: relocation, business models and technological revolution in the global automotive industry

II

A. An industry in constant change

A new global economy has emerged in recent decades. While globalization was continuously expanding, many manufacturing activities were relocated from their countries of origin to developing economies with the aim of cutting costs. Nonetheless, as this model is increasingly being called into question —and the concept of post-globalization gains traction— greater attention is now being paid to the location of manufacturing activity for the creation of production linkages, the development of scientific and technological capacities and the dynamism of innovation in national economies (Pisano and Shih, 2009). International enterprises place ever-greater value on these factors in their location decisions; and several advanced countries have renewed their interest in industrial policy to boost the competitiveness of their manufacturing sector.

The relocation of activities to developing countries has not been confined to manufacturing and low-value-added services, and it has generated major tensions in the industrialized economies. The process has been supported by a gradual improvement in the innovation system in some emerging economies and difficulties in separating research and development (R&D) from manufacturing design activities, given the complementary nature of product innovation and processes, and the tensions that arise between those responsible for the strategic areas in question (Galvin, Goracinova and Wolfe, 2014).

Firms are facing ever shorter product life cycles, extremely complex production processes, and increasing technological parity, requiring a wide range of capabilities. Many have been forced to focus on the skills and competencies of their core business and outsource a large number of activities and processes to save time and resources, thereby improving their flexibility and response capacity (Nieuwenhuis and Wells, 2015).

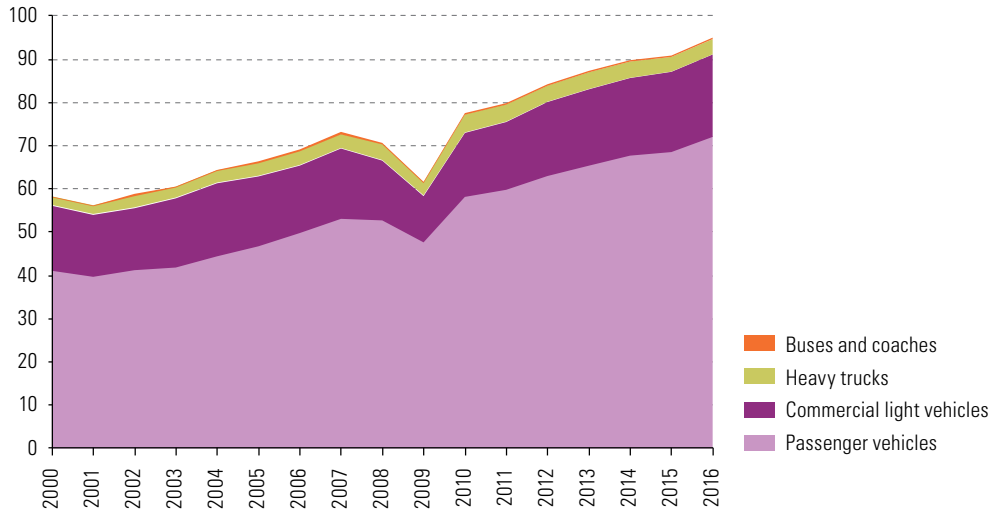
In that context, the automotive industry is rapidly changing some key dimensions of its operations: geographical location, mode of production, relations within the production chain, collaboration mechanisms and product characteristics, as analysed in successive sections of this chapter. Rapid convergence between traditional manufacturing and electronics and software in the sector is changing power relations in the production chain. This subjects the industry's traditional firms to major tensions; and it encourages enterprises that had not previously participated in the sector to enter technologically more advanced segments.

This dynamic is coupled with the goal of many countries to strengthen their industrial activities by generating capacities and knowledge based on new technologies. This has enabled them to make progress with alternatives to the dominant paradigm of the internal combustion engine and to facilitate the incorporation of electronics, software and connectivity in automobiles. This has been possible thanks to the support provided to collaborative initiatives and platforms between companies, research institutions and governments (Warwick, 2013).

B. The new geography: the rise of East Asia

The global automotive industry has grown strongly for more than a century and has managed to overcome episodes such as the Second World War, the rise in oil prices in the 1970s and the international financial crisis of 2008 (see figure II.1). At present, the sector remains a pillar of the world economy and a driver of economic growth and technological progress, with strong inter-industry linkages (ATKearney, 2013).

Figure II.1
Global vehicle production, by vehicle type, 2000-2016
(Millions of units)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).

1. Redefining the global oligopoly: a new triad of regions

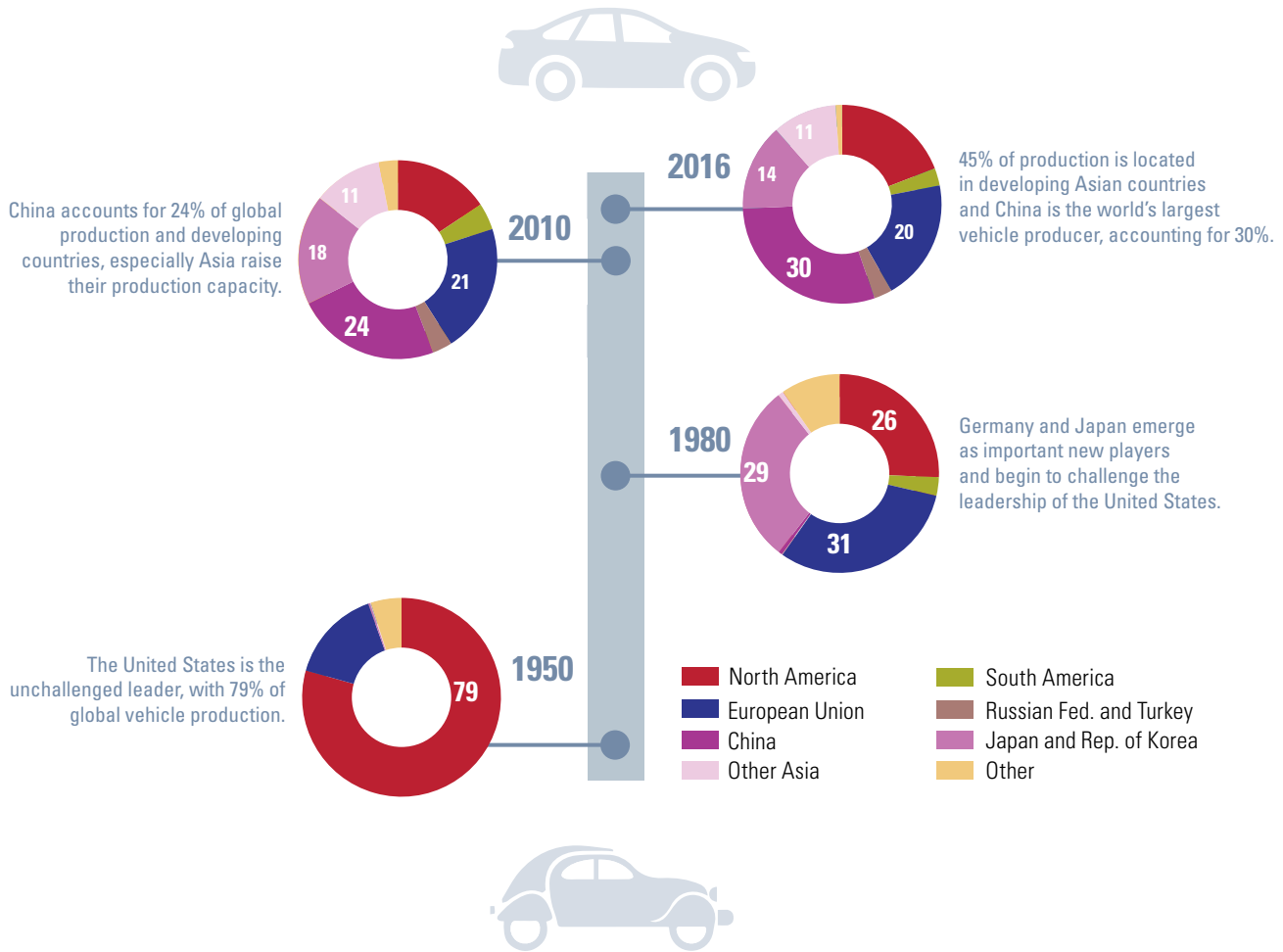
The location of production has undergone sweeping changes in the past few decades.

The location of automotive production has experienced a major transformation in recent decades. In 1950, the United States dominated the industry unchallenged, accounting for 76% of vehicle manufacture worldwide. Germany and Japan emerged later as two new major players and started to challenge that leadership. By 1990, Japan's share of world production had grown to 28%, comfortably ahead of the United States (20%) or Germany (10%). At the turn of the new century, the relocation of production became consolidated as a central element in the strategies of the world's leading manufacturers, with the share of emerging economies rising sharply (see figure II.2 and annex table II.A1.1)

Although developed countries continued to provide the most important markets, the favourable growth prospects of the largest emerging economies, together with the rapid diffusion of market-friendly reforms, the liberalization of foreign trade and lower production costs, combined to concentrate the expansion of production capacity in developing countries, particularly in Asia (see annex tables II.A1 and II.A2)

Over the last two decades, the global production of the automotive industry has grown at around 3% per annum, albeit with large differences between regions (Gao, Hensley and Zielke, 2014). Between 2000 and 2016, output rose from 58.4 million to about 95 million units, of which more than 75% were passenger vehicles. By 2016, 45% of production was taking place in developing countries in Asia; and China had become the world's largest vehicle manufacturer, producing 30% of the total (see figures II.1, II.2 and II.3).

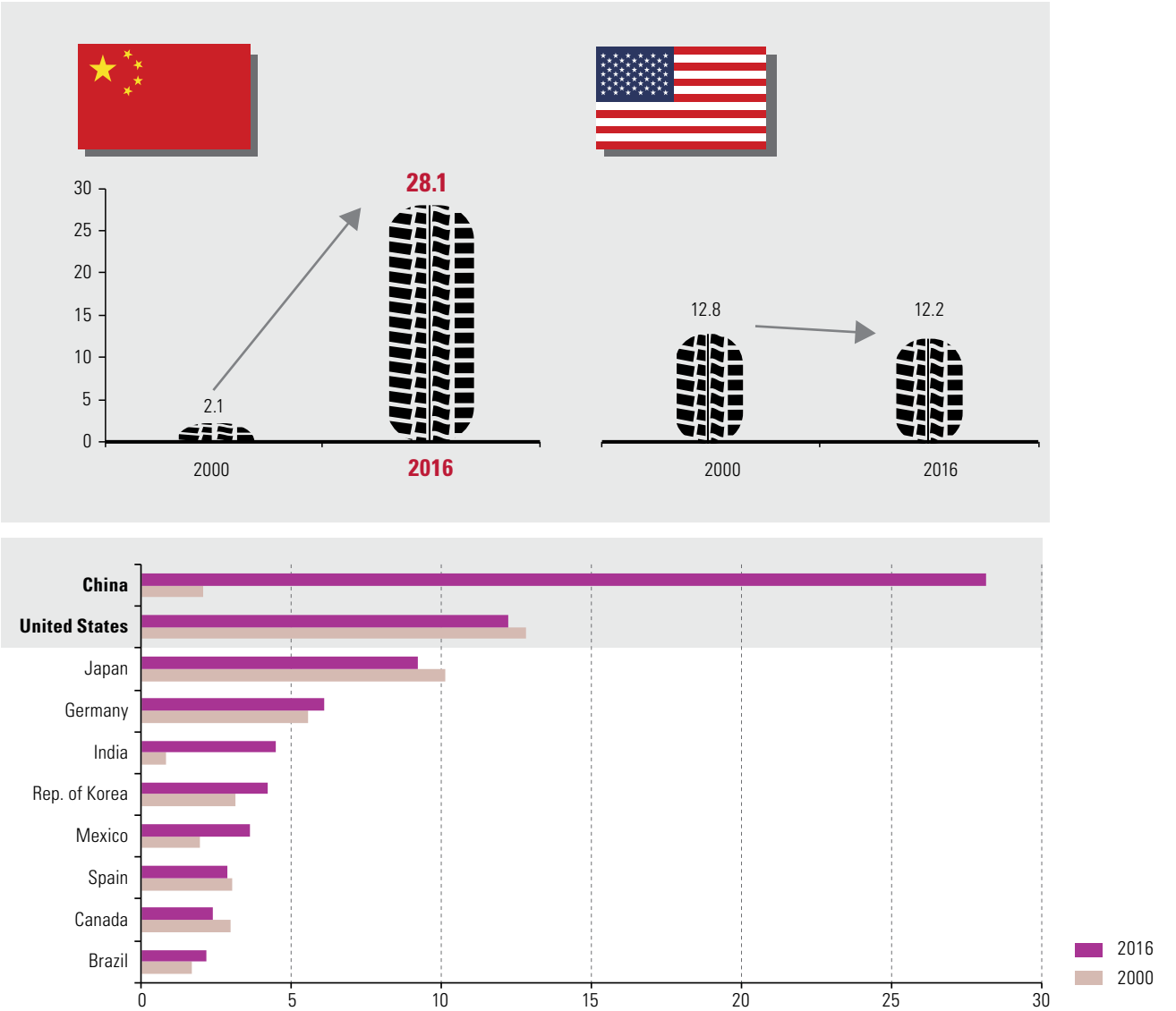
Figure II.2
Vehicle production, by selected countries and regions, 1950-2016
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).

Vehicle manufacturers and their suppliers have deployed ambitious investment plans to expand their production capacity in developing countries. Between 2003 and 2016, cross-border investments announced by the main vehicle manufacturers amounted to nearly US$ 600 billion, of which about 40% went to Asian countries, mainly China (23% of the total) (see figure II.4).

Figure II.3
Main vehicle-producing countries, 2000-2016
(Millions of units)

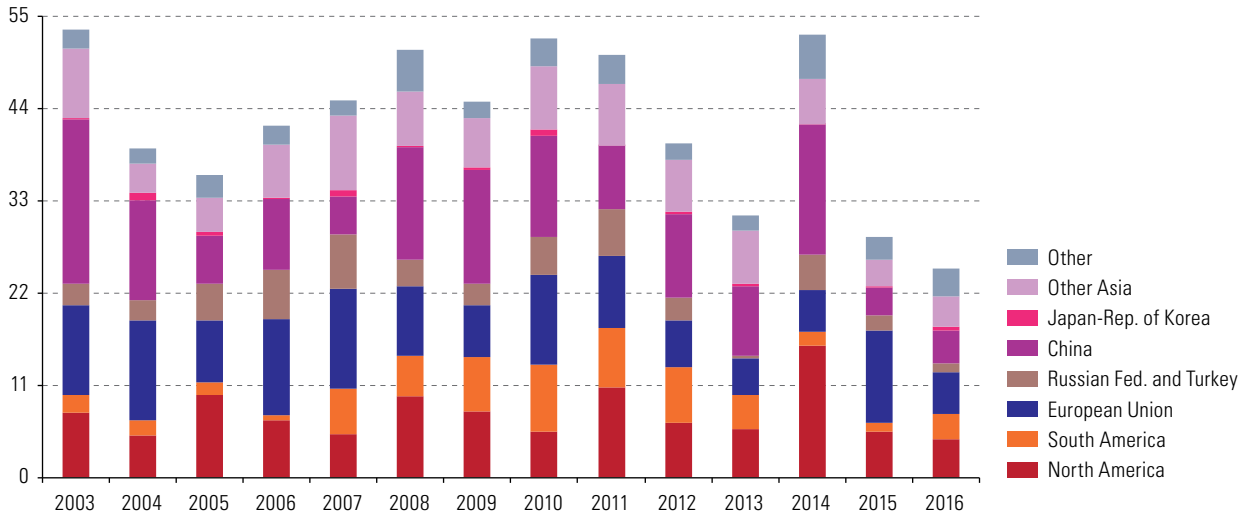


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).

Vehicle manufacturing in the traditional markets of industrialized countries declined considerably. Production in the United States —badly affected by the 2008 crisis— saw its share of the global total slump from 22% to 13% between 2000 and 2016 (see box II.1). In the same period, Japan's share also retreated sharply from 17% to 10% of world production, while the European Union's share dropped from 29% to 20% (see figure II.2).[1]

[1] The European vehicle-producing countries most affected include France (from 5.7% to 2.2%), Spain (from 5.2% to 3.0%), the United Kingdom (from 3.1% to 1.9%) and Italy (from 3.0% to 1.2%). In contrast, Germany has kept a substantial part of its productive capacity within its own borders despite a sharp fall (from 9.5% to 6.4%).

Figure II.4
Vehicle manufacturers: announced cross-border investments, by selected countries and regions, 2003-2016
(Billions of dollars)



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

Box II.1
Crisis of the United States automotive industry

In late 2008, the economic downturn undermined demand, and the leading American manufacturers saw their revenues decline. This led Chrysler and General Motors to file for protection under Chapter 11 of the Bankruptcy Code. General Motors, Ford Motor and Chrysler were also carrying serious structural problems associated with high labour costs, especially inherited costs associated with pensions and retiree health insurance. Tighter credit restrictions in the wake of the crisis also hampered manufacturers' ability to negotiate bank loans to help them survive the slump in demand and access credit to finance new vehicle purchases. Lastly, the rise in oil prices undermined the demand for light commercial vehicles and vans, more than in other segments. These types of vehicles were the most profitable for United States manufacturers; and General Motors, Chrysler and Ford were especially dependent on them.

Chrysler and General Motors received US$ 62 billion in loans from the United States Treasury through the Automotive Industry Financing Programme, under the Troubled Asset Relief Programme in December 2008 and July 2009. Loans from the Automotive Industry Financing Programme were conditional on applicants being able to submit a viable restructuring plan. In April 2009, Chrysler and General Motors accepted the provisions of Chapter 11 of the Bankruptcy Code, and ambitious restructuring plans were put in place that included renegotiation of debt and contracts with workers' unions, plant closures, asset sales, a reduction in the number of dealers, and, in the case of Chrysler, partnership with the Italian manufacturer Fiat. Confident in the success of the restructuring of both companies, the Governments of Canada and the United States supported them with abundant financial resources. Ford, which had originally sought government aid along with Chrysler and General Motors, drew on a US$ 10 billion credit line it had secured prior to the crisis and continued to operate without government support.

United States manufacturers were thus able to bring production plans more into line with consumer demands. In fact, as a result of the restructuring, with fewer operating plants and lower debt obligations, General Motors and Chrysler gained flexibility enabling them to adapt rapidly to changing demand conditions. The new wage structure negotiated with the unions also contributed to cost reductions and a downscaling of the output of unprofitable vehicles in the United States, especially compact cars.

Box II.1 (concluded)

Although the crisis hit all vehicle manufacturers, it was felt much less intensely by foreign manufacturers with operations in the United States. In general, Japanese and German companies had lower fixed costs and a more balanced product range aligned with consumer needs. In fact, they sold more passenger cars than light sport utility vehicles (SUVs), light trucks and pick-up vehicles.

Many analysts disapproved of the measures adopted by the government, arguing that Chrysler would go bankrupt even with a bailout, and that Ford really did not need one. The main impact of the rescue was job savings at General Motors. Nonetheless, the economic recession forced this firm to cut production and employment, despite the bailout. Moreover, as the economic situation improved, the Japanese manufacturers Toyota Motor and Honda continued to invest and create new jobs in the United States.

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

The upshot of this dynamic is automotive production currently concentrated in a triad formed by North America, the European Union and certain Asian countries. This represents a deconcentration with respect to the traditional predominance of the United States, but also the creation of an oligopoly of countries, with few significant entrants.

2. Stability among the dominant enterprise group

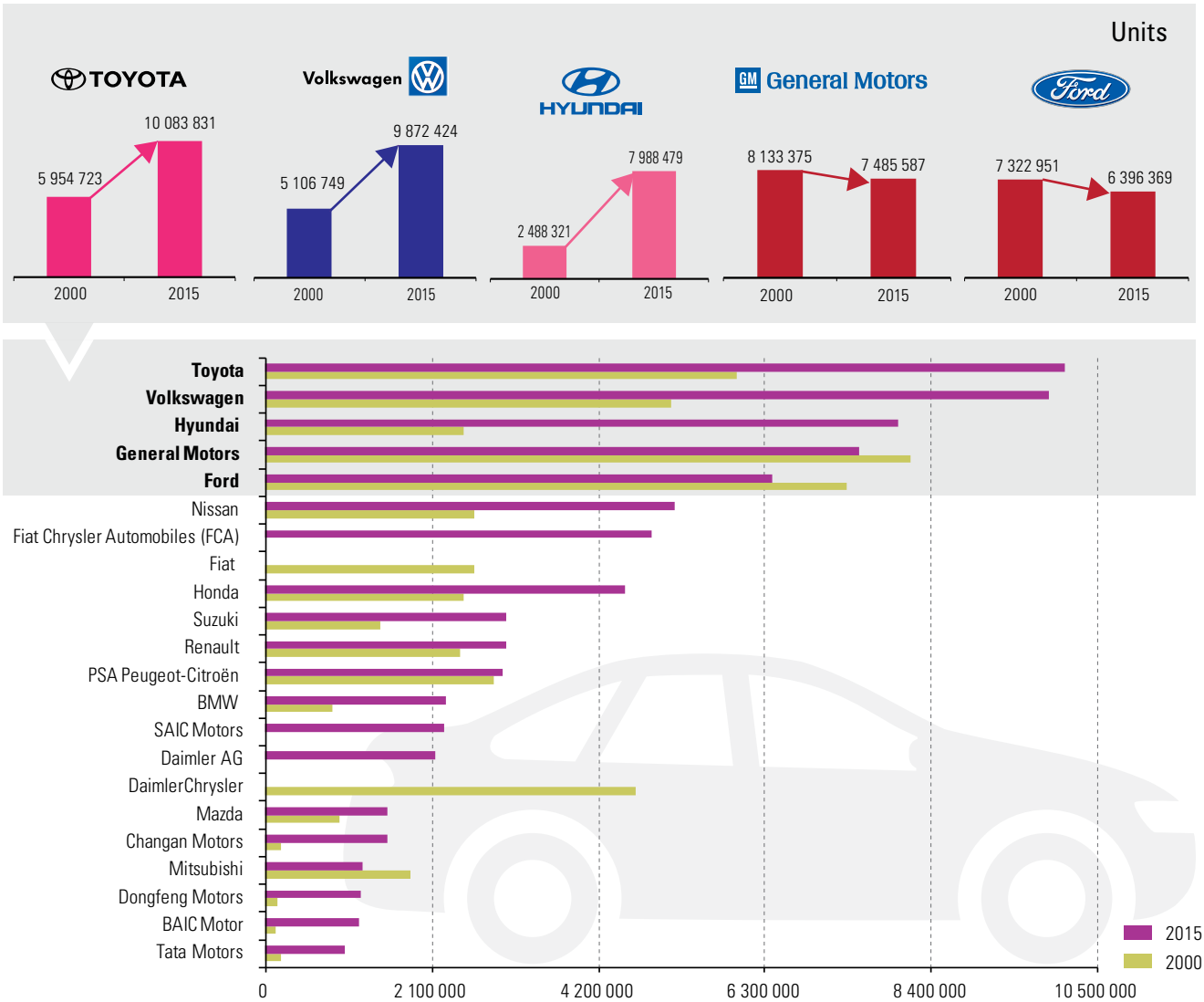
Although there has been a major shift in global production towards emerging economies, the firms that have pursued this strategy are the same as have dominated the industry over the last few decades (see figure II.5). Between 2000 and 2015, four of the top five vehicle manufacturers have remained at the apex of the industry. Japan's Toyota Motor, Germany's Volkswagen, and General Motors and Ford of the United States have been able to defend their leading positions. In contrast the United-States-based Chrysler, currently part of Italy's Fiat Chrysler Automobiles (FCA), which was hit by the 2008 financial crisis and has undergone multiple changes of ownership, slipped several rungs. In contrast, the South Korean group Hyundai Motor emerged as the world's third largest vehicle producer in 2015 (see figure II.5 and annex table II.A1.3).

Early in the 2000 decade, manufacturers in the United States, Europe and Japan each accounted for around 30% of world production. Fifteen years later, while the European and Japanese manufacturers had maintained their share, those of the United States had dwindled to around 16%. In the same period, however, the manufacturers of China, India and the Republic of Korea increased their weight in the global automotive industry. Particularly significant has been the performance of Chinese firms, which expanded from a 1% share of global vehicle production in 2000 to one of 13% in 2015. To access the market, overcome protectionist measures and take advantage of State support, the leading international manufacturers started operations in China in partnership with local enterprises, with a commitment to share technology. Although Chinese production is essentially for the domestic market, the leading firms also have started to export (see box II.2).

Historically, vehicle manufacturers have made and sold a large proportion of their production in their country of origin. More recently however, transport costs, exchange-rate risks, trade barriers, the saturation of domestic markets and favourable growth prospects in certain emerging markets have sharply reduced this

percentage, prompting manufacturers to produce in the region where they intended to sell their products (USITC, 2013). In the early years of the 2000 decade, the largest manufacturers (except Volkswagen) had more than 50% of their production in their country of origin. In contrast, only Toyota, Hyundai and Bayerische Motoren Werke (BMW) now have less than 60% of their production abroad (see figure II.6).

Figure II.5
Leading vehicle manufacturing firms, 2000-2015
(Units)

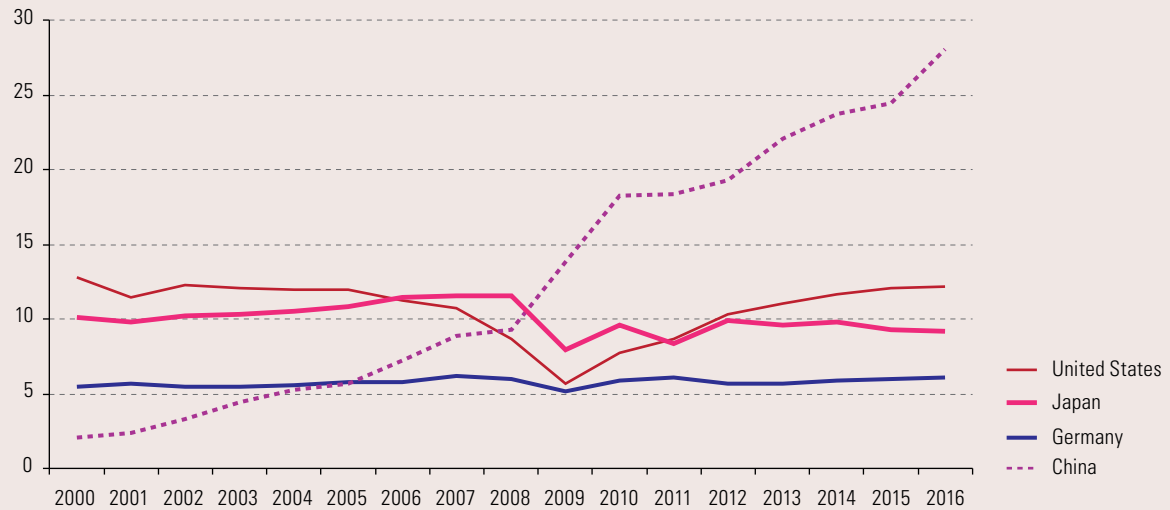


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).

Box II.2
China: the rapid rise of the global automotive industry leader

In the early 1980s, the Chinese government started lifting restrictions on vehicle purchases. With limited local production, despite the existence of high tariffs, this led to rapid import growth and inflated the trade deficit. In response, local authorities imposed restrictions on imports and sought to stimulate domestic production by entering partnerships with international manufacturers to form joint ventures with domestic firms. The first foreign manufacturers to sign contracts to produce vehicles in China were American Motors Corporation (later taken over by Chrysler), Volkswagen and Peugeot.[a] In these early joint ventures, the Chinese partners had very limited access to the technology of foreign manufacturers; and production processes essentially involved the assembly of totally unassembled components.

Leading vehicle producing countries, 2000-2016
(Millions of units)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).

In the early 1990s, the Chinese auto industry started to gain momentum; and vehicle production rose from 1 million to 2 million units between 1992 and 2000. China's admission to the World Trade Organization (WTO) in 2001 boosted vehicle manufacturing still further. Between 2000 and 2010, production grew at an annual rate of 26.4%, which implied an annual increase in production capacity of over 1 million units. In 2008 China overtook the United States and the following year surpassed Japan to become the largest producer of vehicles in the world. In 2016, production and sales exceeded 28 million units, thus extending the country's leadership worldwide in terms of volume.

Between 2006 and 2016, the number of vehicles per 1,000 inhabitants in China rose from 18 to 104, which is still a very low penetration rate despite very strong growth. By 2015, there were more than 172 million vehicles in use in China, a figure surpassed only by the United States. Nonetheless, despite the economic slowdown and increasing traffic and pollution problems, this indicator is expected to reach about 158 vehicles per 1,000 inhabitants by 2021 (EIU, 2017). Production and sales of light vehicles are thus set to increase from about 25 million units in 2016 to around 33 million in 2022, making China the driver of the global automotive industry (PwC, 2016a).

Most Chinese production is destined for the local market, with vehicle exports only modest thus far. Between 2009 and 2012 they increased from 370,000 to 1,056,000 units, before slipping back to 708,000 in 2016, or 2.5% of total production. Low prices have not been enough to seduce international consumers, owing to problems with product quality (EIU, 2017). On the other hand, economic growth generated substantial import growth, especially of models not produced locally. Between 2009 and 2014, imports grew from 421,000 to about 1,423,000 units, before dropping back to 1,041,000 in 2016, owing to an increase in local supply of high-end vehicles produced in China.

Vehicle production in China remains fragmented with many small-scale producers; nonetheless a small group of large companies concentrate a large share of production. Foreign manufacturers operating under joint ventures with local firms dominate the market, led by Volkswagen and General Motors, and followed some way behind by Honda, Toyota

Box II.2 (concluded)

and Hyundai. The massive investment made by foreign manufacturers has resulted in large surplus productive capacity, estimated at 50% in 2015 (EIU, 2017). As the market cools, margins will be squeezed and small domestic producers will be forced to consolidate. At present, local producers are beginning to gain ground over foreign manufacturers. In 2016, Chinese manufacturers with their own brands control about 43% of the market, led by SAIC Motor Corporation, Changan Motors, Dongfeng Motor Corporation and BAIC Automotive Group (CAAM, 2017).

Foreign investment by Chinese automakers will also help international expansion. Greeley is using its Swedish Volvo subsidiary to expand in Europe, while Dongfeng's investment in the PSA Group will support the French automaker's investment in the Islamic Republic of Iran, among other markets.

The joint ventures policy has had mixed results. On the one hand, the country with the largest automobile market in the world has been able to be supply itself largely with locally manufactured products. Between 2003 and 2016, foreign vehicle manufacturers announced investments in China worth over US$ 140 billion, equivalent to 23% of the total cross-border investment made by these companies globally during that period. The industry has created hundreds of thousands of jobs, boosted a booming domestic parts, accessories and components industry with export capacity; and it has helped drive the rapid expansion of the consumer economy. As a result, China's automotive industry policy, which is actually one of import substitution, has been successful.

More than 30 years after the establishment of the first joint venture, and unlike in Japan and the Republic of Korea, foreign-brand vehicles continue to dominate the domestic market. In the joint ventures, the Chinese counterpart is generally in charge of assembly operations, while the foreign manufacturer focuses on brands, design and research and development (R&D). Foreign manufacturers have been very cautious in the sphere of intellectual property and cutting-edge technologies (Chang, 2016). Accordingly, the Chinese authorities have started to shift the emphasis of their automotive sector policy —from industry growth to strategic aspects such as innovation, the deployment of local brands and the promotion and development of alternative energy vehicles, especially electric ones.

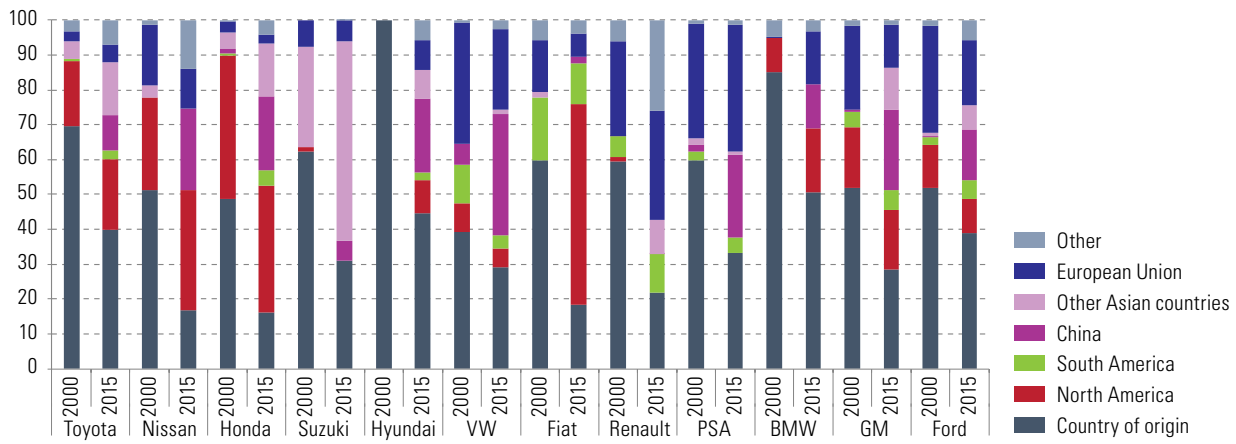
Source:Economic Commission for Latin America and the Caribbean (ECLAC).

[a] In 1984, the first joint venture between American Motors Corporation (AMC) and Beijing Automobile Works, now known as the Beijing Automotive Industry Corporation (BAIC), was set up. In the same year, the partnership between Volkswagen and the Shanghai Automobile Assembly Plant, now known as the Shanghai Automotive Industry Corporation (SAIC), was created; and, in 1985, the third joint venture was established between Peugeot and Guangzhou Automotive Manufacturing Plant, which is currently named Guangzhou Automobile Industry Group.

Figure II.6

Geographical distribution of production by the main vehicle manufacturers, by selected regions and countries, 2000-2015

(Percentages)

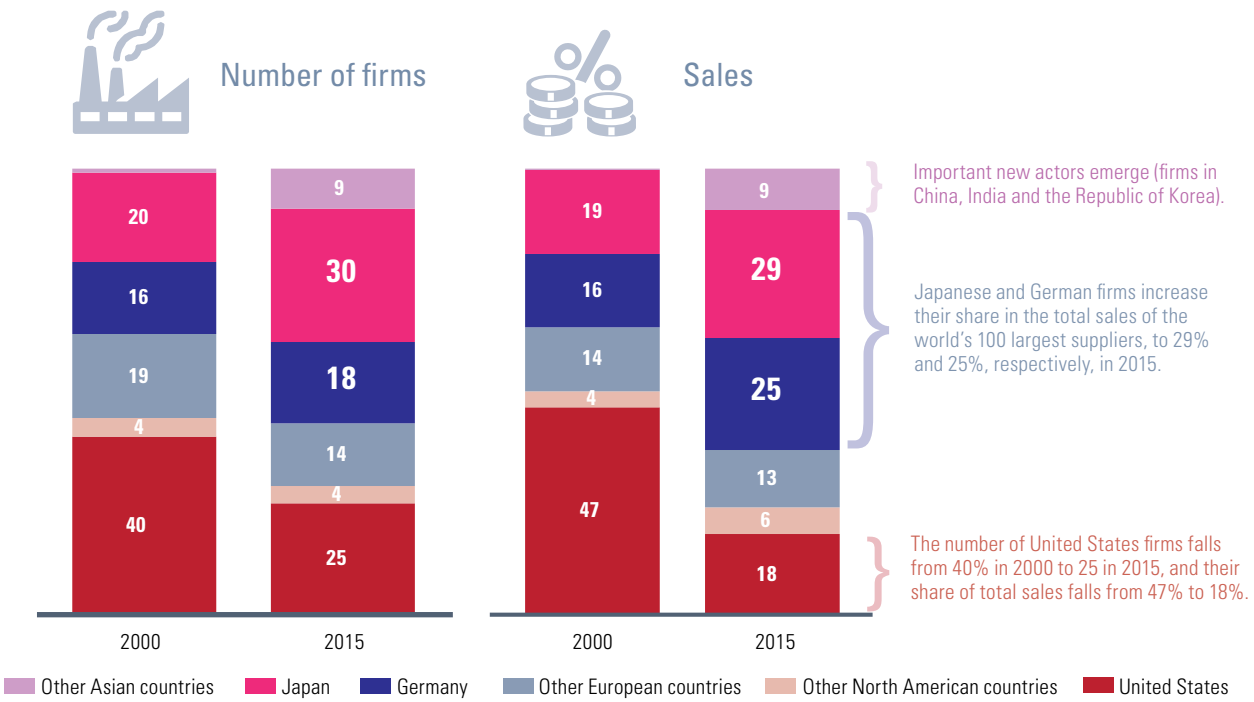


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).

The geographical restructuring of production did not only affect vehicle manufacturers, since far-reaching changes were generated among other agents in the production chain.

First, there were significant changes in the leadership and origin of the main suppliers (see annex II.A4). In 2000, 40 of the world's 100 largest suppliers were United States enterprises, and they generated about 47% of sales in this group (see figure II.7). Since then, the structure of the market has changed rapidly, however. While United States firms are now less prominent among major international suppliers —badly hit by the impact of the financial crisis— German and Japanese companies have gained ground. Among the top 100 global suppliers, the number of United States firms fell from 32 to 25 between 2005 and 2015, bringing their share of total sales down from 34% to 18%. In contrast, while the number of Japanese and German players remained relatively constant during this period, they increased their share of the total sales of the world's 100 largest suppliers to 29% and 25%, respectively, in 2015. Lastly, important new players have emerged, particularly firms from China, India and the Republic of Korea, which were virtually absent 15 years ago.

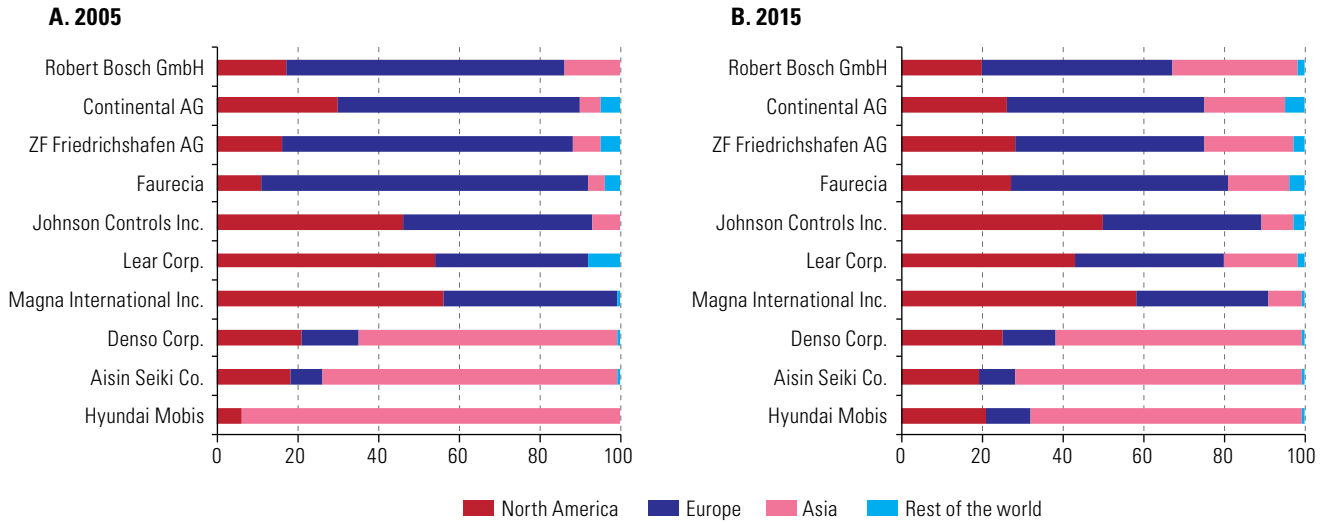
Figure II.7
World's 100 largest suppliers of components to vehicle manufacturers, by number of firms, sales and enterprise origin, 2000-2015
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of *Automotive News*, "Top 100 global OEM parts suppliers. Ranked on 2000 global OEM automotive parts sales", Detroit, June 2001 [online] https://www.autonews.com/assets/PDF/CA27371020.PDF; "Top 100 global suppliers: the top 100 global OEM parts suppliers ranked by 2005 global OEM parts sales", Detroit, June 2006 [online] https://www.autonews.com/assets/PDF/CA99567518.PDF; "Top 100 global suppliers: the top 100 global OEM parts suppliers ranked by 2010 global OEM parts sales", Detroit, June 2011 [online] https://www.autonews.com/assets/PDF/CA74326610.PDF; "Top suppliers: North America, Europe and the world", Detroit, June 2016 [online] https://www.autonews.com/assets/PDF/CA105764617.PDF.

Second, despite maintaining a strong presence in their region of origin, parts, accessories and component suppliers rapidly expanded the geographical diversification of their sales, accompanying the internationalization process among vehicle manufacturers. Between 2005 and 2015, for example, Germany's Robert Bosch GmbH grew its worldwide sales to vehicle manufacturers from US$ 28.4 billion to US$ 44.825 billion —reducing its European share from 69% to 47%, while practically maintaining its presence in North America (17% versus 20%), but expanding significantly in Asia (from 14% to 31%) (see figure II.8).

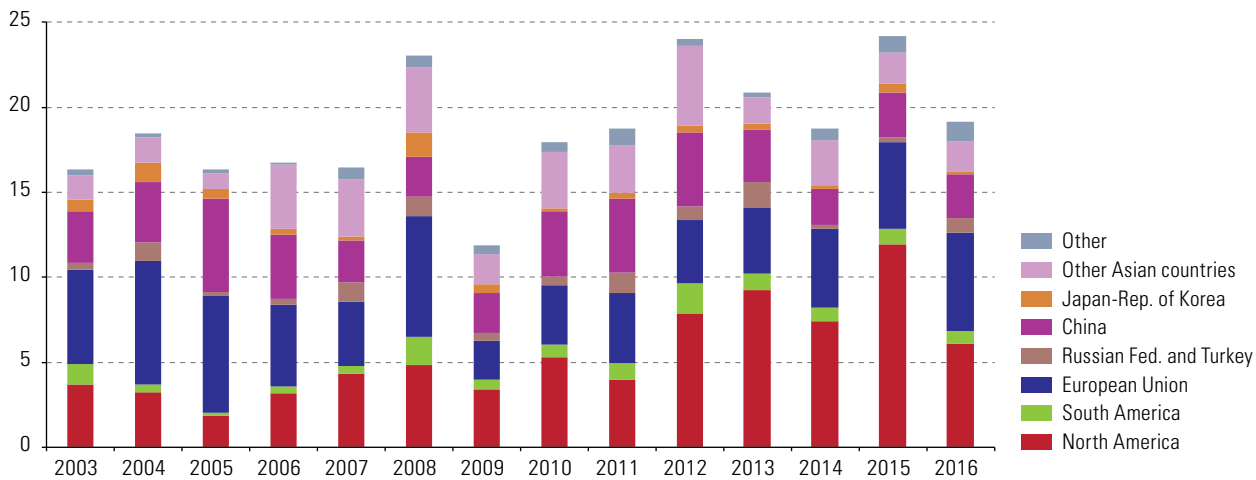
Figure II.8
Sales by the main global suppliers to the automotive industry, by region, 2005-2015
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of *Automotive News*, "Top 100 global suppliers: the top 100 global OEM parts suppliers ranked by 2005 global OEM parts sales", Detroit, June 2006 [online] https://www.autonews.com/assets/PDF/CA99567518.PDF; "Top suppliers: North America, Europe and the world", June 2016 [online] https://www.autonews.com/assets/PDF/CA105764617.PDF.

The suppliers invested heavily in their international expansion. Between 2003 and 2016, they announced cross-border investments of close to US$ 263 billion (equivalent to 50% of investment by manufacturers). Investment announcements were fairly evenly distributed between North America (29%), the European Union (26%) and Asia (34%), where China accounts for over 17% of the total (see figure II. 9). Nearly 70% of cross-border investment announcements were made by German (25%), Japanese (24%) and United States (19%) firms.

Figure II.9
Cross-border investments announced by automotive industry suppliers, by selected countries and regions, 2003-2016
(Billions of dollars)



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

3. International trade continues to be intrafirm and intraregional

The consolidation of the triad of regions has meant that global manufacturers produce in several locations in order to supply different regional markets. Given the investments announced by the leading manufacturers and their suppliers, the structure of trade flows between major markets can be expected to persist in the coming years. In this scenario, countries or markets that have been net importers are likely to see their auto industry trade deficits widen, without many opportunities to reverse the trend (PwC, 2016b).

Automotive product trade flows are determined by intrafirm relationships.

Unforeseen exchange-rate fluctuations could affect the profitability of vehicle production, particularly for export. In Germany and Japan, for example, appreciations of the euro and yen have increased the relative cost of vehicle production; so manufacturers cut back on export-oriented production and boosted their production in third countries.

Automotive product trade flows are determined by the intrafirm relationships forged in the international production systems of the leading manufacturers.[2] This dynamic, fostered by the proliferation and consolidation of free trade and economic integration agreements, affords a heavy intraregional bias to trade in automotive products, especially in North America —under the North American Free Trade Agreement (NAFTA)— and in the European Union. In Asia, since much of the production base remains in the firms' home markets, exports serve a wider range of destinations. Moreover, import volumes are smaller, such as in Japan and the Republic of Korea, or else are sourced from mature markets to complement supply and provide more sophisticated inputs to local production processes, as is the case in China (see figures II.10 and II.11). In this context, the European Union, NAFTA, China, Japan and the Republic of Korea currently account for about 90% of total automotive industry exports and 80% of the industry's total imports[3] (see annex tables II.A1.5 and II.A1.6).

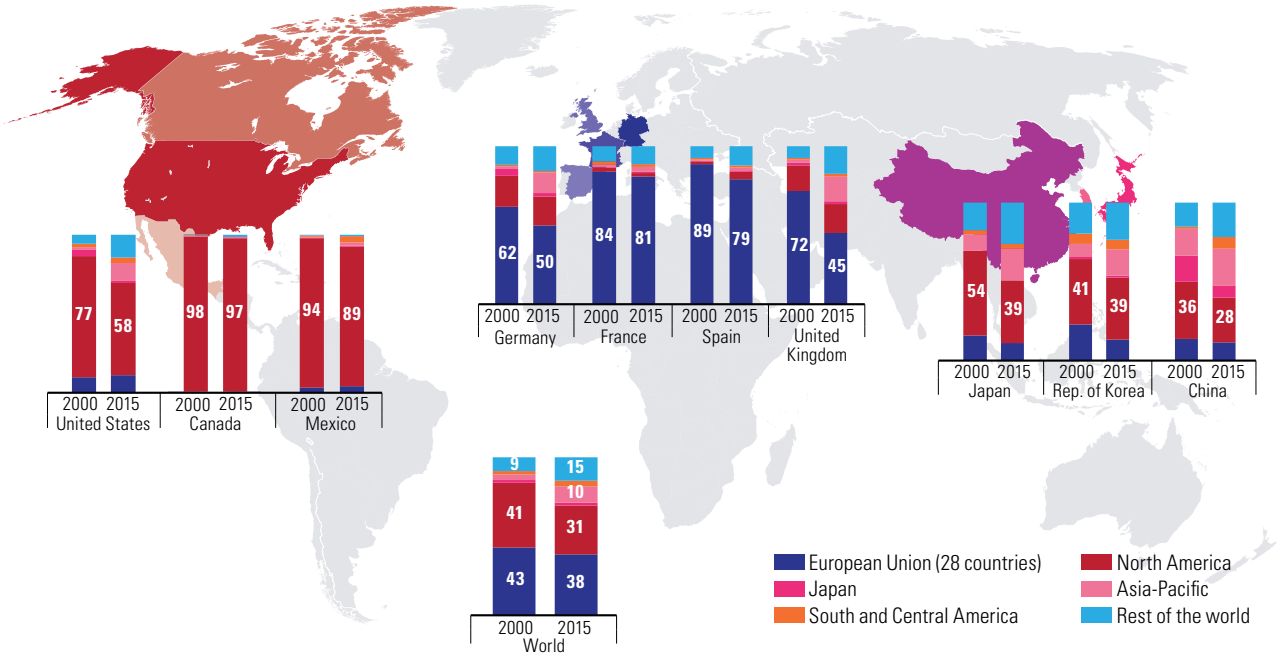
Light vehicles (passenger cars and light commercial vehicles) accounted for 56% of global trade in automotive products in 2015, while heavy vehicles (trucks and buses) generated around 10%. Lastly, parts, components and accessories for vehicle manufacture, along with internal combustion engines, account for the other third of automotive product trade (see figures II.12 and II.13).[4]

2 Automotive products include: motor cars and other motor vehicles principally designed for the transport of persons (other than motor vehicles for the transport of ten or more persons, including the driver), including station-wagons and racing cars (781); Motor vehicles for the transport of goods and special purpose motor vehicles (782); Road motor vehicles, n.e.s. (783); parts, and accessories of the motor vehicles of groups 722, 781, 782 and 783 (784); Internal combustion piston engines for propelling vehicles of division 78, group 722 and headings 744.14, 744.15 and 891.11(713.2); and electrical equipment, n.e.s., for internal combustion engines and vehicles, and parts thereof (778.3).

3 Between 2000 and 2015, automotive exports increased from US$ 528 billion to US$ 1.3 trillion and accounted for just over 8% of total merchandise exports worldwide. The European Union is the origin of about 50% of these trade flows, although only a third goes to markets outside the bloc (WTO, 2016, ACEA, 2016). The leading individual exporter is Germany (18.3%), followed by Japan (10.3%), the United States (9.8%), Mexico (7.3%) and the Republic of Korea (5.4%). The European Union also generates around 40% of global imports of automotive products, 88% of which come from within that region. In North America, over 50% of imports are internal. The United States is currently the world's largest importer of automotive products (22%), followed by Germany (8%), the United Kingdom (6%), China (5.6%) and Canada (5.2%).

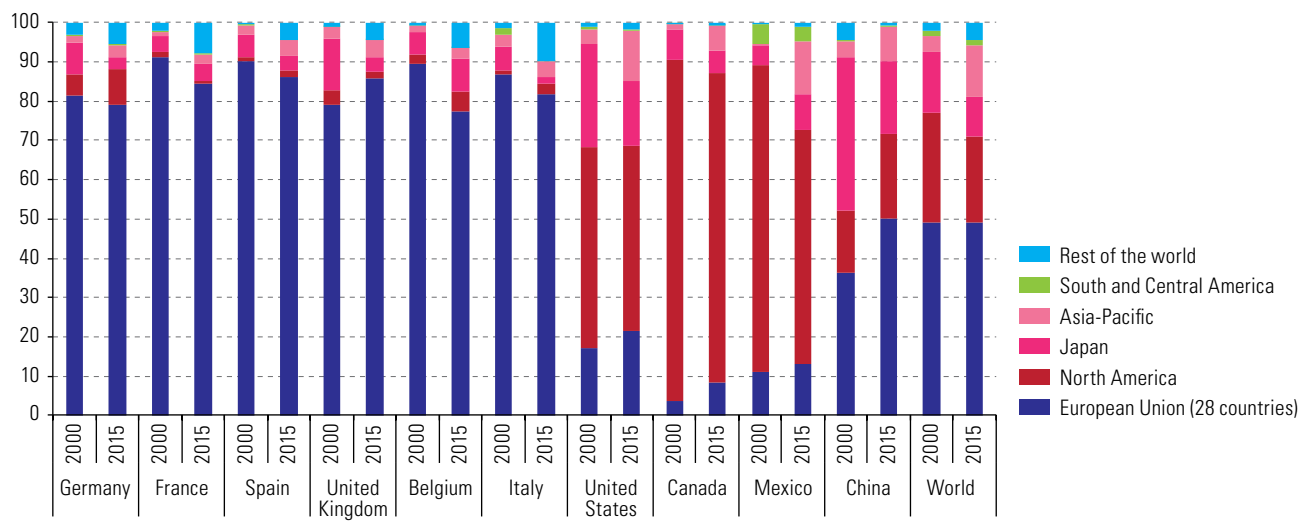
4 In North America, 77% of exports and 53% of imports of automotive products, respectively, have both destination and origin in NAFTA member countries. In the United States, light vehicles are the most important item, accounting for 43% of total exports, while Canada (27%) and Mexico (6%) are also important destinations. 44% of exports of automotive products are parts, accessories and components (including internal combustion engines), mainly destined for Mexico (39%) and Canada (38%). Lastly, heavy vehicles account for 13% of these sales abroad, with Canada (73%) as the priority destination. On the other side of the equation, 58% of automotive imports correspond to light vehicles, with 40% sourced from Canada and Mexico. About 31% are components, parts, accessories and engines, mainly from Mexico. The remaining 11% corresponds to imports of heavy vehicles, where Mexico is the main supplier. As a complement, while Canada specializes in light-duty vehicles, with 73% of its exports of automotive products mainly destined for the United States (96%), Mexico exhibits a fairly balanced supply, where light vehicles, components, parts, accessories and engines, and heavy vehicles have a similar share of 34%, 35% and 31%, respectively, mainly for the United States (see figures II.12 and II.13).

Figure II.10
Main automotive product exporting countries, by geographical destination, 2000-2015
(Percentages)



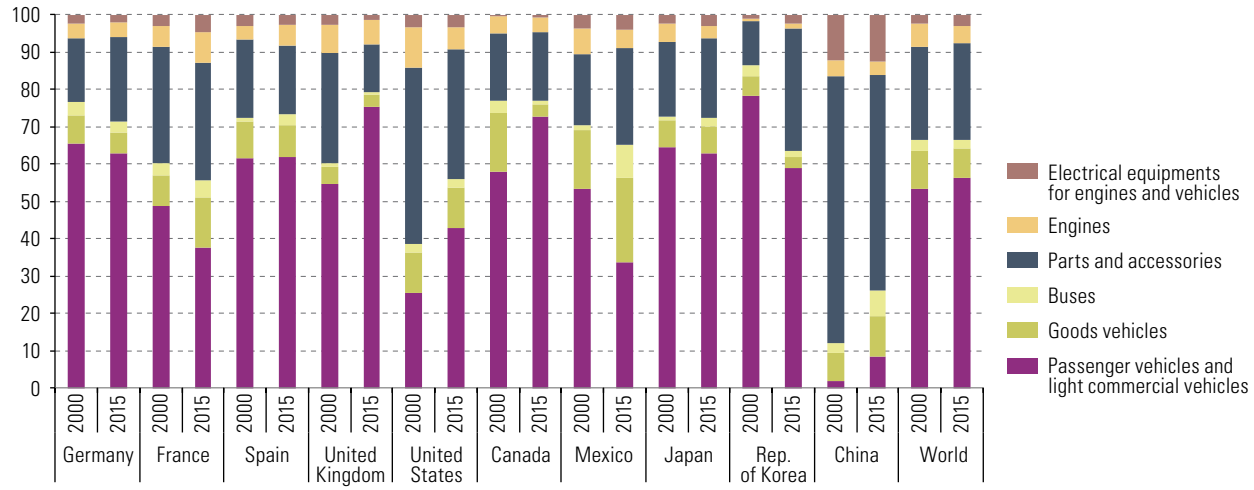
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

Figure II.11
Main automotive product importing countries, by geographical origin, 2000-2015
(Percentages)



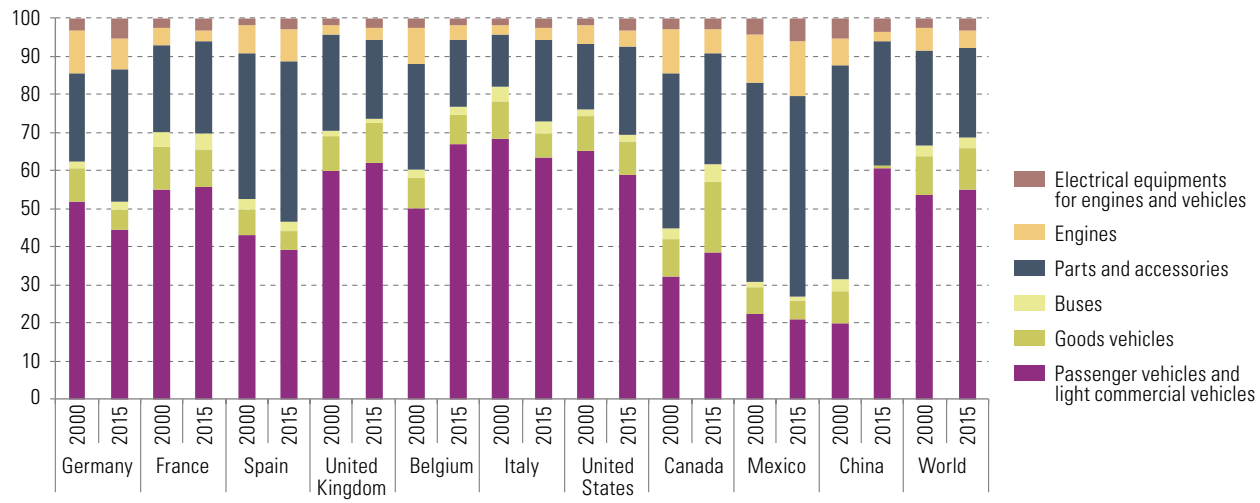
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

Figure II.12
Main automotive product exporting countries, by type of product, 2000-2015
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).
Note: Automotive products corresponding to categories 781, 782, 783, 784, 713.2 and 778.3 of the Standard International Trade Classification (SITC) Rev. 3.

Figure II.13
Main automotive product importing countries, by type of product, 2000-2015
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).
Note: Automotive products corresponding to categories 781, 782, 783, 784, 713.2 and 778.3 of the Standard International Trade Classification (SITC) Rev. 3.

The United States is a net importer of motor vehicle products, posting a sectoral trade deficit of US$ 167 billion in 2016. After collapsing in the wake of the 2008 international crisis, United States imports have since rebounded vigorously to reach a level of US$ 295 billion by 2016. Building on geographical proximity, NAFTA has transformed Canada and Mexico into the main suppliers of the United States market, displacing other major automotive product suppliers, such as Germany and Japan, in particular (CAR, 2017; USITC, 2013).[5] In 2016, Mexico and Canada were, respectively, the source of 28% and 20% of United States automobile imports and the destination for 20% and 40% of its automotive exports. This trend is explained by the growing presence of Japanese, German and, recently, Korean, manufacturers in the United States, Canada and Mexico, with production largely destined for the United States market (Klier and Rubenstein, 2015).

In brief, trade flows serve to reinforce the high degree of regional and enterprise concentration of automotive production. The strong regional bias in trade reflects the strategies pursued by vehicle manufacturers and their suppliers, who locate production close to major markets so as to minimize transport and labour costs.

C. Newcomers are challenging the traditional players

The internationalization and regional concentration of the industry unfolded in an increasingly competitive market, where the major vehicle manufacturers sought new ways to reconcile economies of scale with productive diversification and segmentation, so as to serve ever more demanding and diverse consumers (ECLAC, 2010). In this context, mergers, acquisitions and alliances of varying scope were fundamental for increasing and strengthening market share, improving coverage, accessing new distribution channels, and achieving economies of scale, synergies and new productive and technological capabilities, while also expanding the product range in an increasingly segmented market.

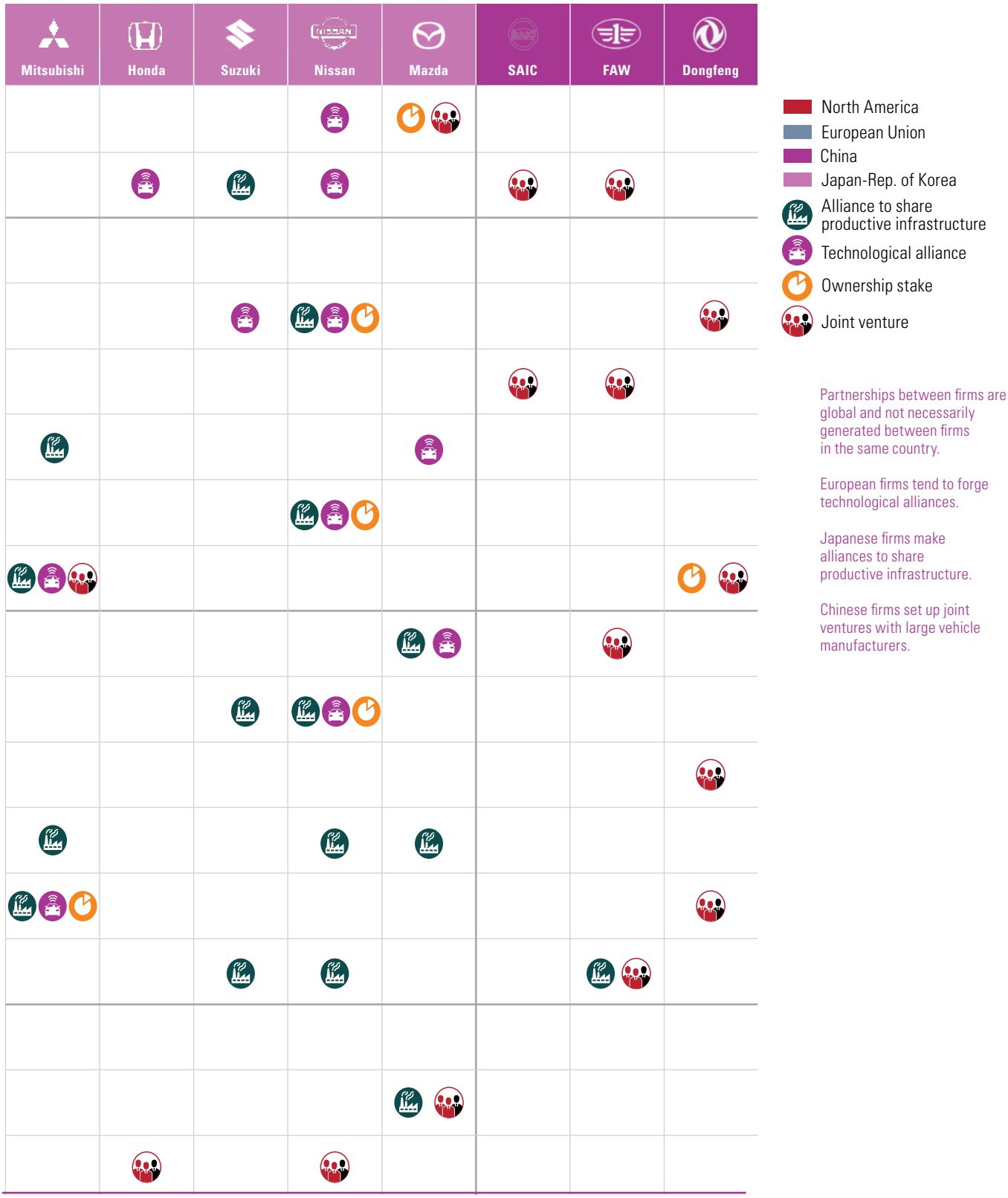
1. Competition among the top manufacturers

The large European manufacturers have been particularly active (see annex table II.A1.7). Volkswagen deployed an ambitious strategy for absorbing other European manufacturers and strengthened its position in the markets for compact cars (SEAT and Skoda), high-end cars (Audi, Bentley, Bugatti, Lamborghini and Porsche), heavy vehicles (Scania and *Maschinenfabrik Augsburg-Nürnberg* (MAN SE), and motor-cycles (Ducati). There were also mergers between the French firms Peugeot and Citroën in 1976 (forming the PSA Group), and between the Italian firm Fiat and the United States firm Chrysler (to form Fiat Chrysler Automobiles (FCA)), which was completed in 2014. France's Renault and Japan's Nissan have a strategic alliance to share production facilities around the world while maintaining their separate identities (Renault supports Nissan in Europe and South America, while Nissan supports Renault in North America and Asia).

[5] The case of Mexico is discussed in detail in chapter III of this report.

Table II.1
Main relations between the largest vehicle manufacturers, ownership shares, technological alliances, partnerships to share productive infrastructure, and joint ventures, 2017

	Ford	GM	BMW	Renault	VW	FCA	Daimler	PSA	Toyota
Ford Motor		●		●		● ●	●	●	
General Motors	●					●		●	
BMW					●			●	●
Renault	●						● ◔	●	
Volkswagen			●						
Fiat Chrysler Automobiles (FCA)	● ●	●						●	●
Daimler AG	●		● ◔						
Grupo PSA	●	●	●	●		●			● ●
Toyota Motor					●	●		● ●	
Mitsubishi Motors						●		● ● ●	
Honda		●							
Suzuki Motor		●		●					
Nissan	●	●		● ● ◔			● ● ◔		
Mazda	◔ ●					●			● ●
SAIC Motor		●			●				
FAW		●			●				●
Dongfeng Motor				●				◔ ●	



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from S. Aversa, "C.A.S.E.-Car of the future: the AlixPartners global automotive outlook 2015", Torino, AlixPartners, 2015 [online] http://www.anfia.it/allegati_contenuti/AlixPartners%20Auto%20study%20ANFIA%202015_stampa.pdf.

The 2008 financial crisis triggered intensive merger and acquisition (M&A) activity. While some companies, such as those of the United States, sought to spin-off non-strategic assets to improve their financial indicators, certain European and Asian companies, particularly in China and India, found great opportunities to grow and gain access to assets that enabled them to pursue a rapid process of technological and commercial convergence with a view to improving and diversifying their product range. As the dominant players started to focus on restructuring their production base —both geographically and technologically— opportunities became scarce and mergers between manufacturers gradually lost momentum. In recent months, however, there have been signs of a potential new wave of transactions that could herald a new stage for the industry.

In August 2016, Toyota completed its total takeover of Daihatsu (in which it had held a 51% stake since 1998) for US$ 3.132 billion. Toyota aims to turn its acquisition into a manufacturer of low-cost compact cars for emerging markets such as China and India. Through this operation, Toyota will provide technological support to Daihatsu, and the two firms will share suppliers and commercial networks (Forbes, 2016a). In October 2016, Nissan acquired a 34% stake in Mitsubishi Motors in an agreement integrating it into the Renault-Nissan Alliance; and the conglomerate thus became one of the three largest vehicle manufacturers in the world, with annual production of almost 10 million units. The firms estimated that the partnership would generate significant synergies in the area of common platforms and joint purchasing, which could produce savings equivalent to 20% of the investment. Also highlighted was their strong complementarity in the development of autonomous driving technologies, hybrid vehicles and electric cars (Fortune, 2016a).

Similarly, as discussed below, the progress of autonomous driving technologies, artificial intelligence and low-emission vehicles force smaller manufacturers to seek partnerships with some of their competitors to reduce costs, share R&D expenses and stay in the market. In February 2017, Suzuki Motor and Toyota officially announced that they were to start talks aimed at forming a partnership in areas such as shared management, hybrid and electric vehicles, safety and autonomous driving technologies (Automotive News, 2017).

In March 2017, the PSA Group bought Opel and Vauxhall (the Opel brand in the United Kingdom) from General Motors for around € 2.2 billion (El País, 2017a). Of the amount paid by the French group, € 1.3 billion represented the assets of the Opel-Vauxhall subsidiary, while the other € 900 million were used to purchase General Motors' financial arm in Europe. In the latter case, the acquisition was shared equally between the PSA Group and the French bank BNP Paribas, with the commitment to maintain the United States subsidiary's current network in Europe. Through this operation, the PSA Group seeks to expand and strengthen its production base to position itself as the second largest car manufacturer in Europe, after Volkswagen. The resulting enterprise will manufacture over 5 million cars worldwide and generate some € 1.7 billion in synergies thanks to the joint development and use of platforms and engines (El País, 2017b).

A few weeks after this transaction, and as part of the restructuring of its international operations, General Motors announced it would abandon South Africa and India to focus on its most profitable markets (The Detroit News, 2017). In South Africa, in addition to no longer selling vehicles, General Motors will transfer its production facilities to the Japanese firm Isuzu, a manufacturer specializing in heavy vehicles with which GM has maintained a close relationship in recent years. In India, it will no longer sell vehicles on the domestic market but produce for export only, mainly serving Mexico, South Africa and Central America. A second General Motors plant in India stopped producing in early 2017 and was sold to its Chinese partner, SAIC Motor (CNN Money, 2017a).

As a result of the geographical restructuring of production and business consolidation, global production is currently concentrated in a few companies. Some 50 manufacturers from a dozen countries generate 99% of global production, with about 30% generated by the international production network of Japanese manufacturers. Further behind are firms from Germany (16%), the United States (16%), China (13%) and the Republic of Korea (9%).

In 2015, the top five manufacturers were responsible for 46% of world production; and the top 10 accounted for 72%. Between 2000 and 2015, apart from the arrival of the Korean company Hyundai and ownership changes in Chrysler, the key changes were the evolution shown by the largest manufacturers grouped by country of origin. While the United States firms, General Motors and Ford, which had led the industry at the start of the 2000 decade, experienced a rapid loss of world production share, Asian manufacturers, mainly Japanese (Toyota, Nissan and Honda) and those from the Republic of Korea (Hyundai), substantially improved their global position. Over the past 15 years, the combined market share of General Motors and Ford has dropped from 27% to 15%, whereas the four largest Asian manufacturers (Toyota, Hyundai, Nissan and Honda) boosted their share of global production from 23% to 31%. European firms display conflicting trends: while Volkswagen (and to a lesser extent Bayerische Motoren Werke (BMW)) increased their share of world production (from 9% to 11%), the PSA Group and Renault slipped back (from 9% to 7%). This could change following the PSA Group's takeover of Opel, bringing the French manufacturers in line with the German trend.

Global production is concentrated in just a few firms. In 2015, the top five manufacturers were responsible for 46% of world production.

Although the ten largest manufacturers have maintained their importance, new players have started to appear and challenge them, most notably Chinese firms (see Box II.2). While the top 10 manufacturers' share of total global production shrank from 80% to 72% between 2000 and 2015, the production of own brands —not counting joint ventures with other international manufacturers— of the largest Chinese automotive companies in the world market increased from 1% to 13% over the same period. Moreover, while there were just four Chinese firms among the 41 largest vehicle manufacturers in 2000, by 2015 there were 21 in the top 50.

Despite the long-term slowdown projected for mature markets, competition in the automotive industry is increasingly intense, with a larger number of manufacturers and an unprecedented and growing number of models launched on the market. Between 2000 and 2015, the number of manufacturers grew from 89 to 97, while the number of models increased from 1,544 to 2,306. While introducing new models on the market has become easier, thanks to the adoption of global modular platforms as discussed below, manufacturers face the new operational complexities of managing an ever-more extensive product portfolio (IHS Markit, 2015) (see annex table II.A1.9).

In this complex and competitive landscape, an extensive network of relationships has emerged among the major manufacturers (see table II.1). The corresponding links currently include cross-shareholdings, the establishment of joint ventures and alliances for collaboration in the technological field, and for the sharing of production or marketing platforms. Although European and Japanese manufacturers are particularly active in collaborating with their peers of the same origin, these relationships are not limited to geographical proximity and there are many that bring together large companies from different continents (for example, the partnership between Nissan, Renault and Mitsubishi Motors).

The largest manufacturers have succeeded in maintaining their leadership positions through an international relocation strategy based on an extensive network of alliances with some of their peers to support a broad and flexible production base that makes it possible to supply a wide range of products to increasingly segmented markets. The

expansion in the product range was achieved by acquiring a number of specialized manufacturers, together with a resolute R&D strategy to accompany changes in consumer preferences and to adapt new technological developments —mainly in electronics, connectivity and new materials— that were starting to have applications available in the market. For example, the three largest manufacturers —Volkswagen, Toyota and Hyundai— supply vehicles for virtually every market segment and have pioneered the launch of hybrid and electric versions (see annex table II.A1.9).

2. The increasing power of suppliers

Complementary to what is happening among the vehicle manufacturers —slowing of consolidation and the appearance of challenging new firms from emerging economies— major changes are also taking place among component, parts and accessory suppliers that will change the industry's future value chain.[6]

To ensure a reliable supplier base, the manufacturers encouraged them to set up their own factories in the markets to which production was shifting. In this process, suppliers grew in size and quickly became international enterprises. Thus, auto-makers are increasingly assemblers rather than "manufacturers". Between 1985 and 2015, the contribution made by suppliers to total industry value-added grew from 56% to 82% (Kallstrom, 2015). The stability and profitability of vehicle manufacturers are intricately linked to their growing global supplier base, in a dynamic that has intensified manufacturers' reliance on their suppliers, especially in emerging markets. As the international expansion of the industry and convergence between conventional and electronic automobiles gather pace, manufacturers are forging ever closer relations with their suppliers.

Mergers and acquisitions among suppliers in the automotive industry have increased markedly in recent years (see annex table II.A1.8). Between 2010 and 2015, the value of such operations grew from US$ 13 billion to a record US$ 50 billion, before dropping back to US$ 20 billion in 2016 (PwC, 2016c and 2017a). At least five forces are driving this trend:

- Positive expectations for growth in the global automotive industry.
- The intense process of consolidation among the largest global suppliers.
- The growing role of Chinese suppliers.
- The disruptive effect of new regulatory requirements —energy efficiency and environmental care— and technological changes affecting the supplier firms' business model.
- The existence of suppliers that made deep adjustments as a result of the 2008 crisis and now display sound financial indicators. This gives them the liquidity to make new purchases or become attractive assets for takeover.

After far-reaching internal restructuring, major companies are scaling up their production and strengthening capabilities to underpin the profitability needed to stay at the top of the industry value chain (PwC, 2016d). These actions are driving a rapid process of consolidation of the components, parts and accessories subsector, led by a small group of firms from Germany, the United States and Japan.

[6] Vehicle production requires thousands of parts and inputs from many suppliers. An automobile usually consists of 20,000 to 30,000 components (JAMA, 2016). In the past, the value chain was tightly controlled by the vehicle manufacturers, which greatly limited the suppliers' bargaining power. However, as part of their risk reduction strategies, some manufacturers have decoupled from their component subsidiaries (examples including Ford, General Motors and Toyota with Visteon, Delphi and Denso, respectively).

The steady growth of automobile production, the increase in size and strengthening of the market position of top-tier suppliers, and the increasing technological content they build into vehicles have allowed the most efficient and innovative supplier firms to generate significant leverage and boost their earnings to historical levels. This performance has afforded suppliers greater liquidity to make new acquisitions; and their earnings figures have also attracted interest from financial investors with no prior experience in the sector (PwC, 2016c) (see annex table II.A1.8).

Most of the acquisitions are explained by the suppliers' need to keep up to date in an industry undergoing rapid and intense technological change. The largest vehicle manufacturers are competing to offer better engines and drive systems, while complying with increasingly stringent regulatory standards on energy efficiency and environmental care, and at the same time meeting consumers' demand for vehicles with increasingly sophisticated connectivity, autonomy and entertainment. These manufacturers' demands have fostered consolidation, mergers and acquisitions, and fuelled a strong innovative momentum among suppliers (PwC, 2016c).

Suppliers are gaining increasing importance within the production chain owing to the international expansion of the industry and convergence between conventional manufacturing and electronics.

Recently, some of the largest acquisitions have targeted two particularly important areas: propulsion systems and advanced electronics for driving assistance.

- In view of the need to manufacture lighter, more energy-efficient and less polluting vehicles, there have been new developments in turbocharging, direct fuel injection and alternative propulsion systems, such as electricity and hydrogen. Technologies such as direct injection and turbocharging are expected to attain vehicle penetration rates of 57% and 40%, respectively, in 2021 (PwC, 2016d). In this context, a key acquisition was that of Remy International Inc., an electric motors specialist, by BorgWarner, a United States engine manufacturer and turbocharger specialist, for US$ 951 million (Bloomberg, 2015a).
- With the increasing incorporation of technology in vehicles, advanced electronics, software and certain hardware components (sensors and cameras) have become a priority goal. This scenario is opening up major opportunities, both for established suppliers and for new entrants. Three large transactions stand out: the purchase of the Israeli autonomous driving technology firm Mobileye by Intel for US$ 14.7 billion in March 2017; acquisition of the United States security systems provider, TRW Automotive Holdings Corp., by Germany's ZF Friedrichshafen AG for US$ 12.494 billion; and purchase of the software area of the Finnish enterprise Elektrobit by Europe's second autoparts producer, Germany's Continental AG, for US$ 680 million (Bloomberg, 2015b).[7] With these operations, the firms have positioned themselves as key suppliers of components for autonomous vehicles, one of the industry's areas of greatest growth potential.

On the other hand, some diversified suppliers are spinning-off less profitable segments and transferring them to enterprises that are looking to strengthen their margins through economies of scale. This strategy includes both the creation of Adient (production of seats and interiors) by Johnson Controls —valued at nearly US$ 29 billion— and the sale of the interiors business of the Canadian firm Magna to the Spanish group Antolin for US$ 525 million (Automotive News, 2015). Thus, with rising R&D expenditures and the urgent need to supply new and innovative products, some major suppliers are attempting to move from low-margin activities towards new ventures based on lighter, more flexible high-tech assets, and thus achieve attractive margins.

[7] The agreement between ZF Friedrichshafen AG and TRW Automotive Holdings Corp. allows the former to incorporate new capabilities that the latter possessed in radar and vision systems, security-oriented computers and electronic power steering, thereby enabling it to offer more sophisticated driving support systems to the company (PwC, 2016e).

Against this backdrop, Chinese supplier firms are becoming increasingly important players in the industry like their vehicle manufacturers (see figure II.8). Firstly, there is an intense process of consolidation of the fragmented local production base. Secondly, some companies have sought alternatives abroad to incorporate capabilities and diversify. Examples include the acquisition of the Italian tyre manufacturer Pirelli by China National Chemical Corp. (ChemChina) for about US$ 7.7 billion (Reuters, 2015a); the purchase of Dutch semiconductor manufacturer NXP Semiconductors N.V. by the Chinese investment fund Beijing Jianguang Asset Management Co., Ltd. (JAC Capital), for US$ 2.75 billion (Bloomberg, 2016a); and the creation of a joint venture between Yanfeng Automotive Trim Systems Co., part of the Shanghai Automotive Industry Corporation (SAIC) group, and United States-based Johnson Controls, to create the world's largest interior components supplier (Johnson Controls, 2015). With acquisitions of this type, Chinese suppliers are progressing their international expansion strategy by strengthening relations with the world's major manufacturers, gaining leadership in various market segments and incorporating new competencies and key capabilities.

The consolidation of suppliers is far from over, however. With the arrival of new emerging-market entrants and rapid technological change, the number and value of transactions is likely to continue to increase. To satisfy the demands of regulatory authorities and vehicle manufacturers, many suppliers need to rapidly incorporate new capabilities in energy efficiency, alternative propulsion systems, connected cars[8] and autonomous driving.[9] At the same time, vehicle manufacturers have continued to replace local or regional suppliers with global players that can support simultaneous vehicle launches on several continents. Takeovers will likely remain an efficient and rapid response to these challenges (PwC, 2016c).

D. Production models based on advanced technologies

1. The new production platforms

Consumer preferences force manufacturers to diversify the models and features offered by their vehicles. In the last 20 years, the largest manufacturers have tripled the number of models they have on the market (Oliver Wyman, 2013). However, in a capital-intensive industry with strong pressure to reduce costs and with ever-shorter product life cycles, companies are forced to rationalize their manufacturing platforms and move towards modular and flexible systems, while reducing the number of production centres and scaling up.

The industry leaders are deploying new platforms to produce in large volumes and at lower costs from common components —engine, cockpit, bodywork, electrical architecture, propulsion, braking and steering systems and so forth— to enhance their flexibility to offer a wide range of models. Volkswagen has been a pioneer, moving towards four modular platforms worldwide. In 2012, the Volkswagen Group announced the MQB (*modularer Querbaukasten*) platform, which debuted the following year in the new generations of Audi A3, VW Golf, SEAT León and ŠKODA Octavia.[10] Other manufacturers, such as the

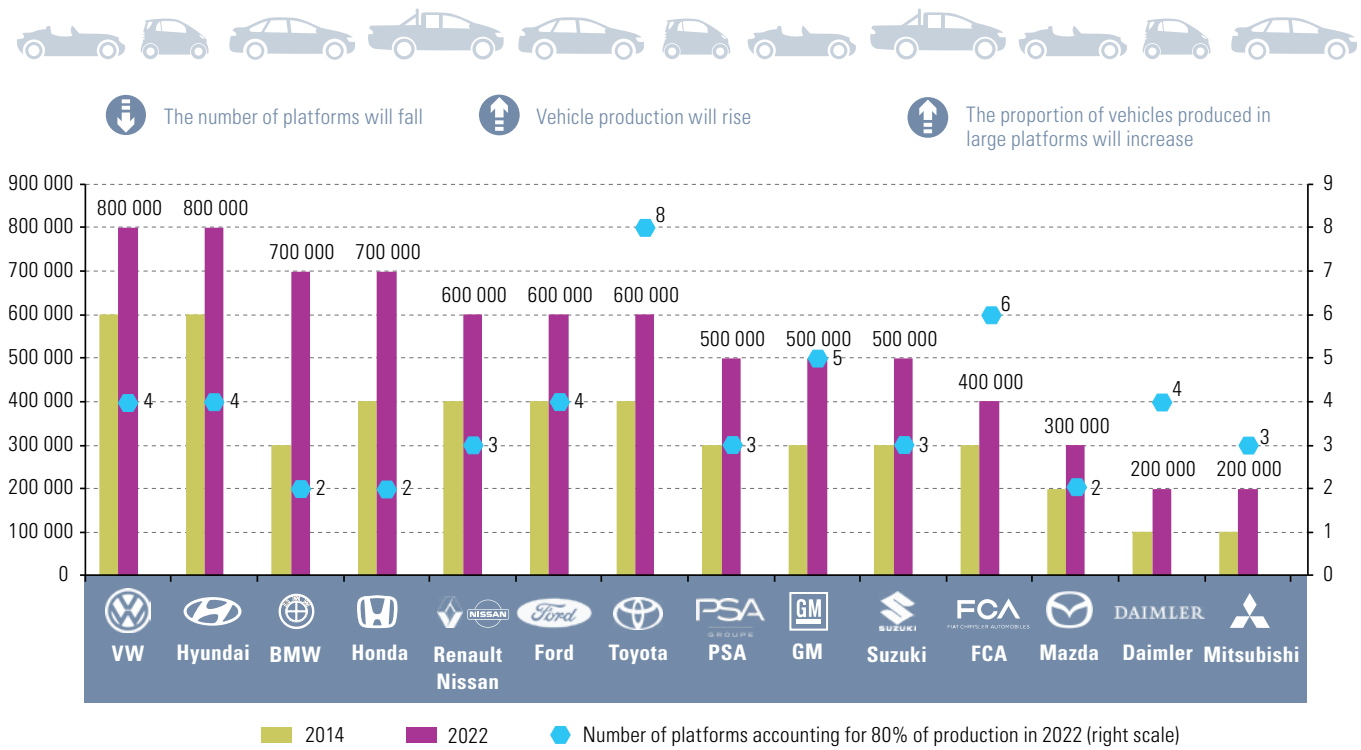
8 Connected cars have Internet access, are equipped with various sensors and are able to send and receive signals, perceive the surrounding physical environment and interact with other vehicles or entities.

9 Autonomous vehicles —also known as self-driving automobiles or robotic cars— operate without a human driver, thereby reducing transport costs and increasing comfort and (in most cases) safety.

10 The MQB (Modular Transverse Construction Block) platform assembles a wide range of medium, executive and luxury vehicle models, with front-mounted transverse engines and front- or all-wheel drive, using standardized components.

PSA Group, Daimler AG, BMW, FCA, General Motors, Ford, Toyota and the Renault-Nissan Alliance, are adopting similar strategies (see figure II.14). The Renault-Nissan Alliance estimates that its Common Module Family (CMF) platform will generate a 30% to 40% reduction in entry cost per model, and a 20% to 30% reduction in the cost of parts and components (Jackson, 2016).[11] A generalization of this trend would lead to a reduction in the number of production platforms worldwide: the leading manufacturers would reduce their number of platforms from 277 to 195 between 2005 and 2020, while increasing vehicle production by around 50%. Most importantly, the proportion of vehicles produced on the larger platforms would grow from 35% to 83% in the same period (IHS, 2015).

Figure II.14
Average production per vehicle construction platform, by firm, 2014-2022
(Units and number of platforms)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of M. Jackson, "The race for competitive advantage via global scale", paper presented at the Seminar UMTRI Automotive Futures: Globalization of the Auto Industry, Ann Arbor, Michigan, 13 April 2016 [online] http://www.umtri.umich.edu/sites/default/files/Mike.Jackson.IHS_.Globalization.2016.pdf.

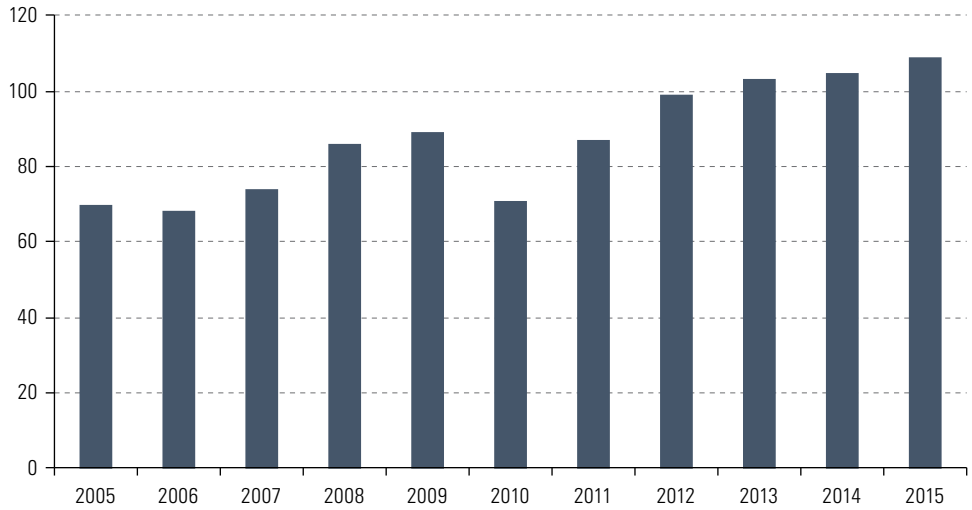
2. Investments in innovation

Investment in R&D in the industry has increased steadily in recent years (see figure II.15). In 2015, with an R&D investment of US$ 109 billion, the automotive industry accounted for 16.1% of the world total, only surpassed by the electronics and computer sector (24.5%) and health care (21.3%). In terms of investment in R&D as a percentage of sales, however, the industry is less prominent, with about a third of the intensity reported by the software and Internet sector (PwC, 2016f).[12]

[11] The CMF system is based on compatible modules —such as the engine, the cab and the front and rear sections of the lower part— which are then joined together to form the complete vehicle. It uses different platforms to build a vehicle, which allows for a wider variety of models and features. The PSA Group plans to build up to six types of vehicle on a single production line following introduction of the Efficient Modular Platform (EMP).

[12] In 2015, with an intensity of R&D spending of 4%, the automotive industry ranks fifth, behind software and Internet (13.8%), health care (11.1%), electronics and computing (6.9%), and aerospace and defence (4.0%).

Figure II.15
Investment in research and development (R&D) by the automotive industry, 2005-2015
(Billions of dollars)

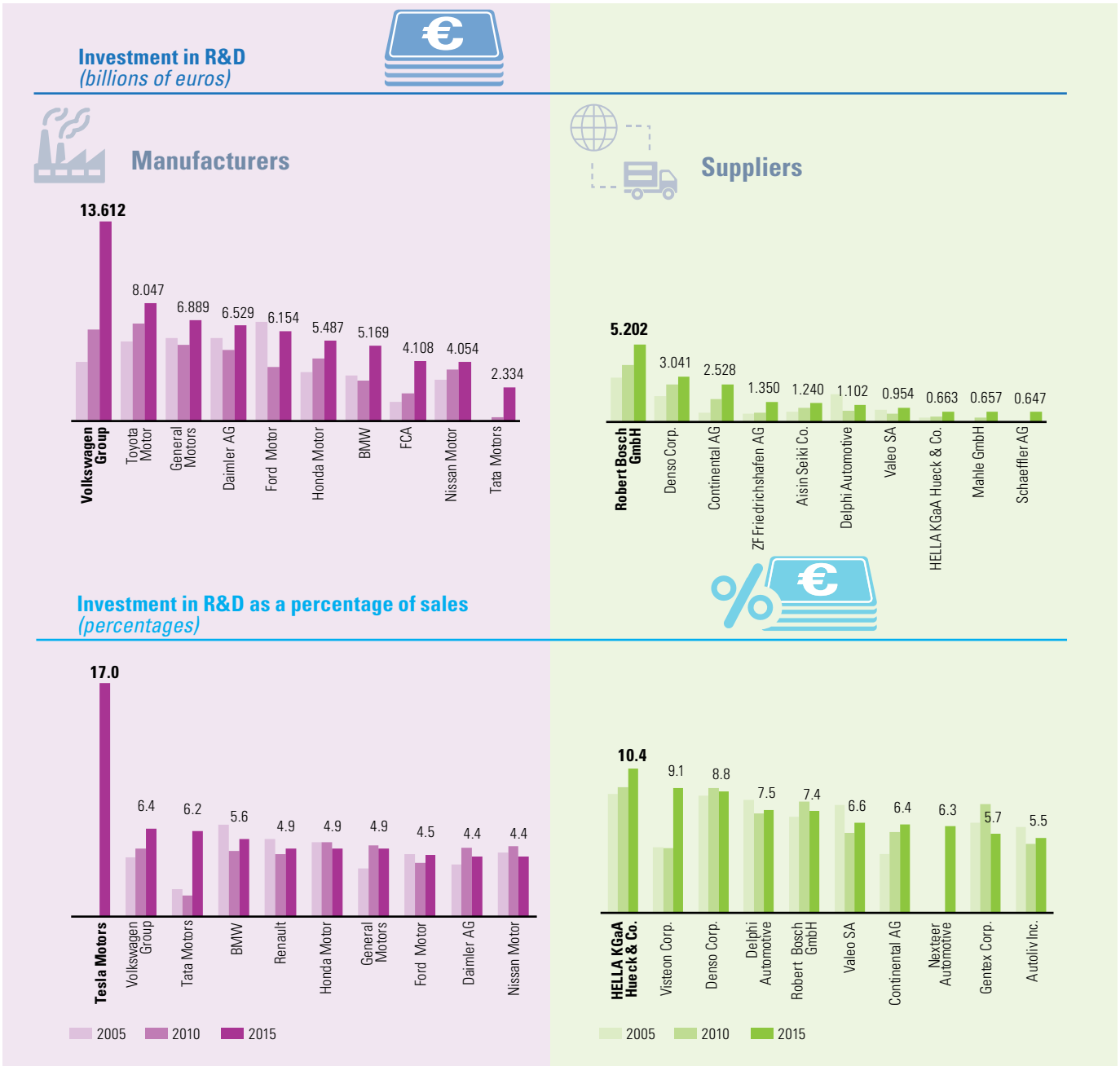


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of PwC, *The 2015 Global Innovation 1000: Automotive Industry Findings*, 2016 [online] https://www.strategyand.pwc.com/media/file/Innnovation-1000-2015-Auto-industry-findings.pdf.

Connectivity-related features are becoming an increasingly important revenue source for manufacturers and for some of their key suppliers (PwC, 2016e). While manufacturers are looking to innovate in products, they are also exploring new business models. In the near future, some of the mobility solutions will depend on the ability to manage digital platforms and cloud-based systems.

The 20 firms that invest most in R&D worldwide include five automobile manufacturers: Volkswagen, Toyota, General Motors, Ford and Daimler AG. Since 2012, Volkswagen has been leader among the most active firms in this field (European Union, 2016). On average, the R&D spending intensity of the major manufacturers has remained stable around 4% and 5% of sales, with the exception of Volkswagen and BMW and the very surprising Tesla Motors. In fact, this electric vehicle manufacturer holds leading positions in several rankings of the most innovative companies in the world (Forbes, 2016b; PwC, 2017b; BCG, 2017). Moreover, the major suppliers, in addition to showing sustained growth, report R&D investment levels equivalent to some of the leading vehicle manufacturers. Most interestingly, they almost double R&D intensity, which confirms that it is suppliers that sustain much of value creation and innovation in the production chain (see figure II.16).

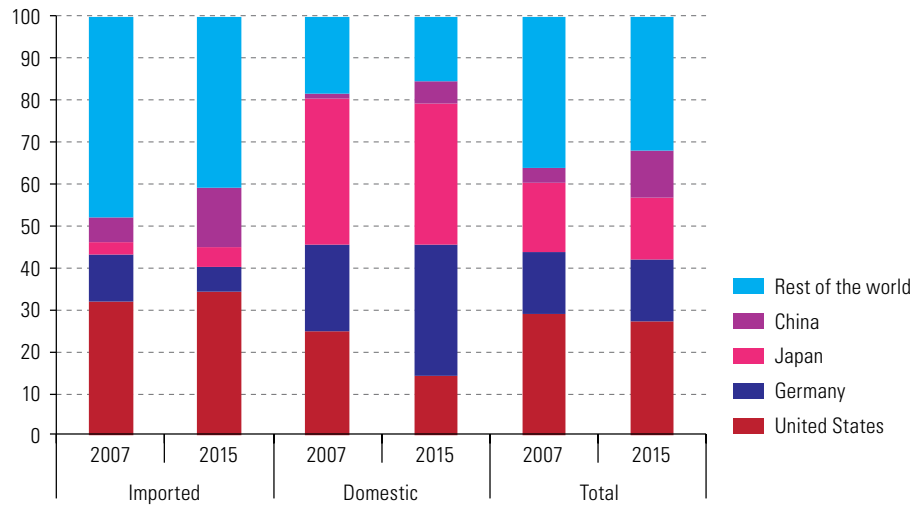
Figure II.16
Investment in research and development and R&D intensity of the leading vehicle suppliers and manufacturers, 2005-2015



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of European Union (EU), *The 2016 EU Industrial R&D Investment Scoreboard, Directorate Growth and Innovation*, Brussels, 2016 [online] http://iri.jrc.ec.europa.eu/scoreboard16.html.

Currently, about two thirds of the industry's R&D investment is located in the United States (27%), Germany (15%), Japan (15%) and China (11%). Between 2007 and 2015, the top three maintained their share, while China expanded from 4% to 11% of the world total. In parallel with the relocation of production, firms in the sector spend an increasing proportion of their R&D budget in countries other than that of their parent company. The significant increase in China's share explains part of this process, as well as the manufacturers' bid, under the conditions imposed by the Chinese Government, to diversify their scientific, technological and innovation capabilities, to bring them closer to their production's destination markets. Currently, R&D investment abroad accounts for almost two-thirds of the total, mainly in the United States (34%) and China (14%), followed by Germany (6%) and Japan (5%). %) (PwC, 2016f), while domestic investment in R&D is heavily dominated by firms in Japan (33%) and Germany (32%) (see figure II.17). This expenditure, both domestically and externally, continues to reinforce the industry's high concentration around three large agglomerations in North America, the European Union and the axis formed by China, Japan and the Republic of Korea.

Figure II.17
Automotive industry: investment in research and development (R&D), domestic and imported, by country, 2007-2015
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of PwC, *The 2015 Global Innovation 1000: Automotive Industry Findings*, 2016 [online] https://www.strategyand.pwc.com/media/file/Innnovation-1000-2015-Auto-industry-findings.pdf.

In 2015, the top five vehicle manufacturers spent about US$ 45 billion on R&D. For most of the industry, however, success has been elusive and there is very little differentiation among participants (PwC, 2016e). To preserve their share of value creation in a commercially and technologically complex scenario, manufacturers and suppliers will have to foster higher levels of innovation, as software and Internet businesses already do. This will entail coping with shorter innovation cycles and, most likely, increasing their investments.

As manufacturers have focused on core competencies, their suppliers have captured an increasing share of value creation, both in production and in R&D. Between 2012 and 2025, the share of manufacturers in the creation of value in R&D worldwide is likely to fall from 60% to 47%, while that of the suppliers is estimated to grow from 31% to 36%, and that of engineering service providers from 9% to 17%. Suppliers will consolidate their position in production, increasing their share in value creation from 65% to some 71%, while that of manufacturers is estimated will fall from 45% to 29% (Oliver Wyman, 2013).

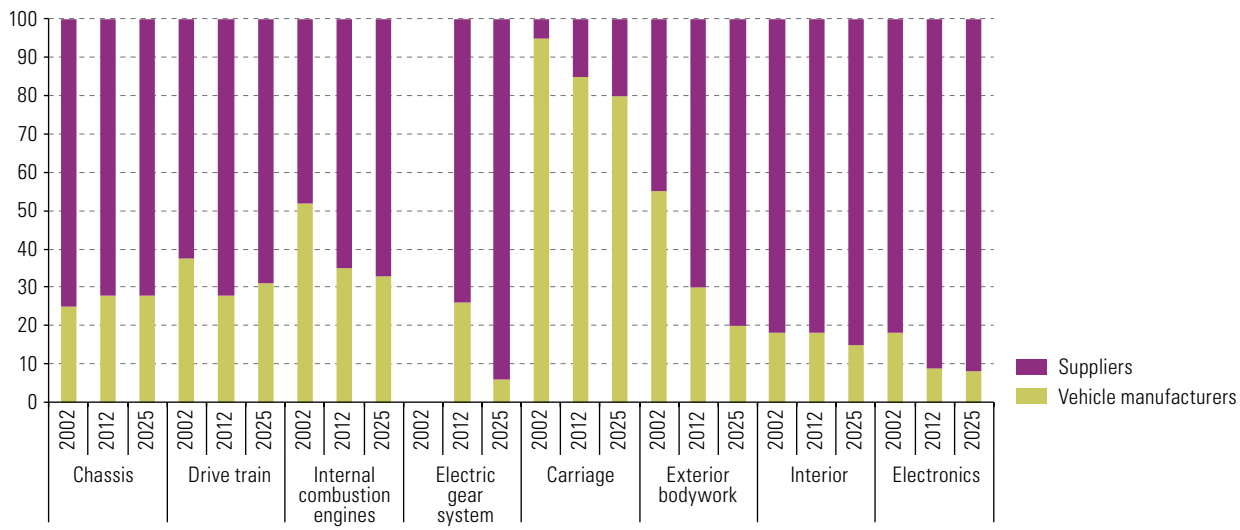
The manufacturers' classic business model, built around the revenue obtained from the sale of new vehicles, is changing as the return on value creation continues to decline. In a market with more demanding consumers, manufacturers are under greater pressure to produce increasingly personalized vehicles; and they have been caught up in a crowding-out dynamic, where more and better technological features are required to stay in a very competitive and saturated international market. In this scenario, technological progress, which in the past was the manufacturers' preserve, is occurring more and more in the suppliers' sphere of action. Moreover, factors such as brand reputation and service are gaining importance for differentiating between manufacturers (GTAI, 2016a).

Suppliers are playing an increasingly important role in some modules traditionally dominated by the manufacturers, such as chassis and bodywork. The need to move towards more energy-efficient products will force new, lighter solutions to be adopted. In a first stage, the most important bodywork changes will occur in high-end vehicles, where there is greater scope for progress in lightweight structures, new materials and design. On the other hand, growing demand for greater safety by consumers will dominate value creation in the chassis module in the mass consumption vehicle segment.

The greatest change is likely to occur in the electric propulsion segment, which is currently one of the most important innovation spaces in the industry. Although manufacturers will continue to control key technologies in this area, their share in creating value for this module will fall to 9% by 2025, maintaining a small share of production. In addition, manufacturers producing internal combustion engines will put even more emphasis on assembly and on research, development and innovation activities, to make progress in more energy-efficient and environmentally-friendly products. However, their share in value creation is expected to drop to 32% (see figure II.18).

Suppliers are playing an increasingly important role in some modules traditionally dominated by manufacturers.

Figure II.18
Vehicle manufacturers and suppliers: share of value added, by module, 2002-2025
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Germany Trade and Invest (GTAI), *Industry Overview: The Automotive Industry in Germany 2016/2017*, Berlin, September 2016 [online] https://www.gtai.de/GTAI/Content/EN/Invest/_SharedDocs/Downloads/GTAI/Industry-overviews/industry-overview-automotive-industry-en.pdf?v=14.

New plants will make it possible to produce better-quality vehicles with fewer faults, a larger variety of models, with a shorter time to market and, above all, lower costs. These physical objectives are being integrated into the digital world to combine smart machines, production systems and processes to form cyber-physical production systems, which are the centre of the fourth industrial revolution (ECLAC, 2016b). Productivity gains will be made not only within the factory (during production), but all along the value chain, starting with engineering and product development (for example through prototyping and virtual testing, or 3D printing), together with supplier logistics and management.

For this to happen, three groups of industry participants must work in coordination. First, infrastructure providers such as telecom operators (America Movil, AT&T, Telefonica) and platform managers (Cisco, Amazon), need to offer support structures and services, ranging from cloud computing to storage and big data analysis. Second, technology firms (General Electric, Siemens, Asea Brown Boveri (ABB) Group) need to provide collaborative robots or remote maintenance systems. Lastly, vehicle manufacturers can become one of the key drivers of the deployment of new technologies (Roland Berger, 2016a). The automotive industry is facing its greatest technological change in more than a century. In this world, strategic alliances between manufacturers and suppliers, and also within the supply chain, will become increasingly important and offer significant growth potential.

The automotive industry is facing its greatest technological change in more than a century.

The new production models of the largest manufacturers increase automation and digitization very significantly, with the widespread incorporation of robots, artificial intelligence and the creation of digital networks with the suppliers. Exploiting digital technologies, they will be able to improve manufacturing techniques by virtue of the principle of commercial efficiency, or just in time, improving the logistics and cost efficiency of an industry involving a large number of suppliers distributed around the world. Continuous real-time data exchange affords a much higher level of intelligence and individualized automation. At present, BMW has to deliver about 30 million parts at the right time and place every day, so that around 9,000 vehicles can be produced at the group's 31 production plants around the world (IHS Markit, 2016). In the future, the firm plans to have a fully networked supply chain, operate with autonomous transport robots and use existing vehicle information for the delivery process, to make the logistics more flexible and efficient (BMW Group, 2016a).

Audi, for its part, has stated that fixed assembly line times are becoming less efficient (Audi, 2016). The more the number of derivatives and model variations grow, the harder it is to control that complexity and integrate new routines into a rigid sequential process. The firm's response is modular assembly, which has already started to be used in the test phase at the Audi plant in Győr (Hungary). With this method, smaller, independent work centres can achieve work routines that are highly flexible in terms of time and space. Driverless transport systems bring vehicles under construction and the parts required from one work centre to another, while a central computer controls driverless transport and recognizes the needs of each centre, ensuring a regular flow (Audi, 2017).

These advances are not confined to vehicle manufacturers. Some of the main suppliers are also at the cutting edge of technology. The largest supplier company in the world, Robert Bosch GmbH, is the only one that actively embraces the three levels of the Internet of Things: devices, gateways and centralized computing.[13] The firm offers

[13] The intelligence of the Internet of Things is developed on three levels. The first is the furthest from centralized equipment and is determined by the capacity of devices to process information. The second consists of the gateways, which group traffic from different devices; and the third is the infrastructure of the firms or the centralized platforms to which devices and gateways send information. The first two are the edge and the third is the cloud. A cloud-only system is a centralized intelligence system, while one that has processes on the Edge is of distributed intelligence.

key integration technologies (such as sensors and software) from which it develops new services. It is currently at the forefront in different applications for connected mobility and autonomous driving. To that end, it is implementing collaborative partnerships with some of the world's leading software businesses, including IBM, SAP, General Electric, Software AG and Amazon.

In this scenario, the vehicle manufacturers will continue to adjust their productive specialization and optimization strategies, and they are likely to start exploring expansion alternatives in new businesses along the value chain frontier associated with service delivery. The aim of this would be to halt, and if possible reverse, their loss of share in the income and profits of the value chain. Leading providers that are currently making large investments in R&D and gaining significant advantages in hardware, software and connectivity services with new vehicles, will seek to consolidate their growing share of revenues and profits.

Neither group has its survival guaranteed. Both the manufacturers and the suppliers need to generate strategic capabilities ahead of future disruptive changes. This means identifying segments and markets with growth potential at an early stage, to understand their firms' growth possibilities, review their value-creation strategy and achieve a competitive position for the future.

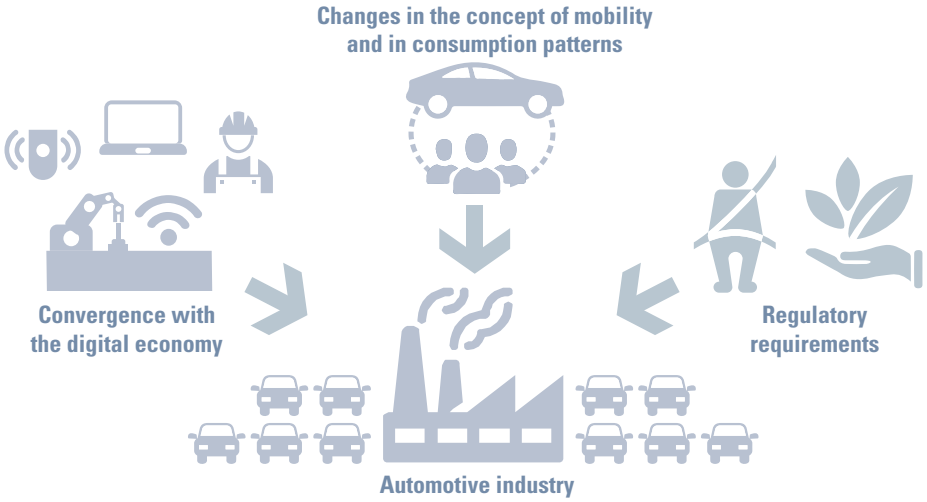
E. Disruptive changes on the short-term horizon

In recent years, the automotive industry has enjoyed high rates of growth and profitability; but there is still considerable uncertainty, not just economic, about its future. Several disruptive trends, driven by external forces, are causing the boundaries of the industry to blur and even disappear (IBM, 2015). At least three forces will shape the industry in the coming years (see diagram II.1):

- Rapid convergence with the digital economy.
- Changes in the concept of mobility and patterns of consumption.
- Stricter regulatory requirements on safety, energy efficiency and environmental stewardship.

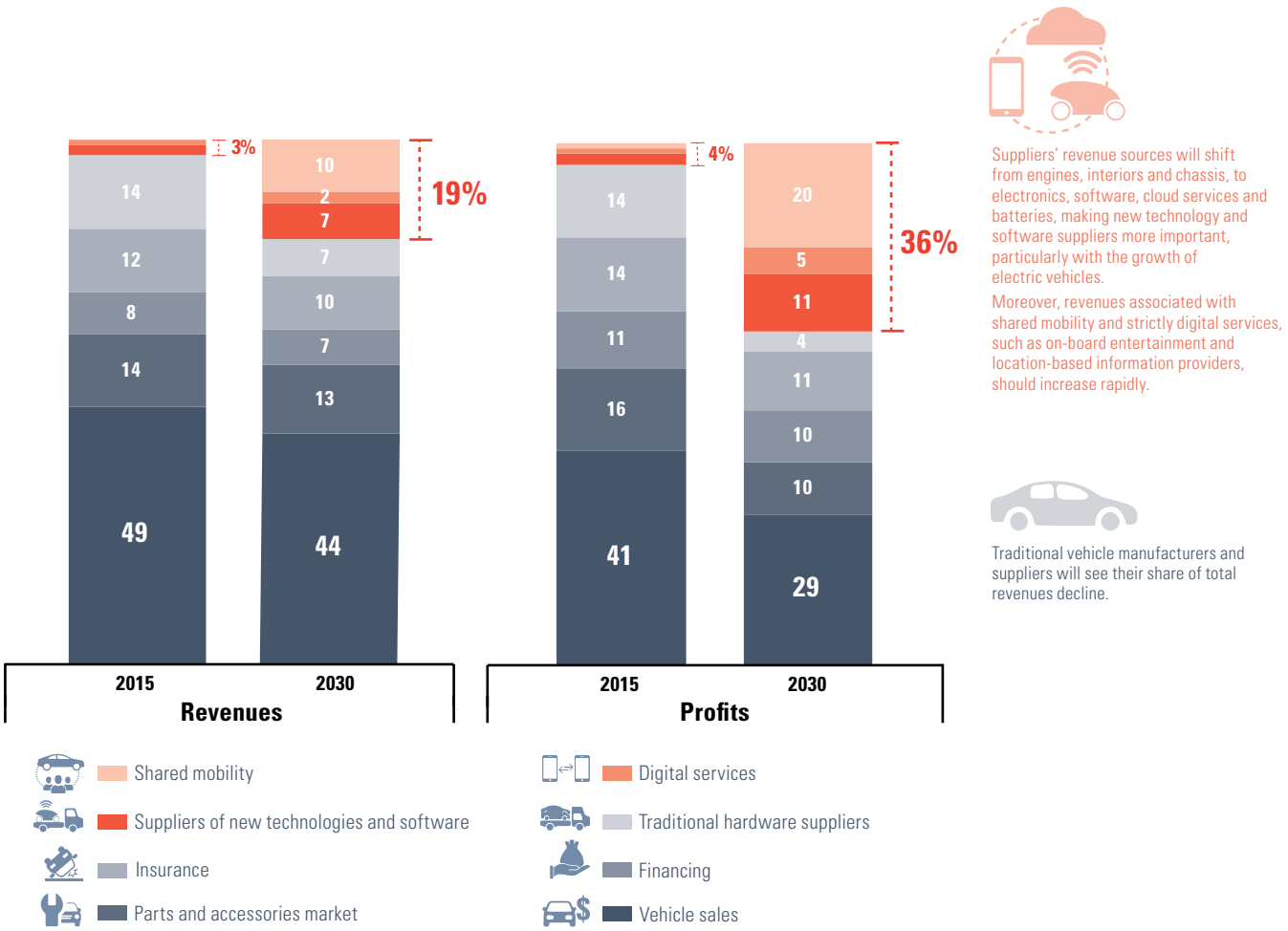
As the industry speeds up its transition from the traditional to the digital economy, from physical goods to services and from hardware to software, there will be major changes in the distribution of revenues and profits, and changes in the boundaries and power relations between the participants in the chain (see figure II.19). Traditional vehicle manufacturers and suppliers will see their share of total revenues decline. The suppliers' revenue source will shift from engines, interiors and chassis, to electronics, software, cloud services and batteries, making new technology and software suppliers more important, particularly with the growth of electric vehicles. The market for spare parts, accessories and components is likely to continue growing in the short term, as the use of shared mobility increases; but it will then decline with the growth of electric vehicles. Moreover, revenues associated with shared mobility and strictly digital services, such as on-board entertainment and location-based information providers, should increase rapidly.

Diagram II.1
Disruptive trends facing the automotive industry



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Figure II.19
Global automotive industry: revenue and profits, 2015 and 2030
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of PwC, *Connected Car Report 2016: Opportunities, Risk, and Turmoil on the Road to Autonomous Vehicles*, 28 September 2016 [online] https://www.strategyand.pwc.com/media/file/Connected-car-report-2016.pdf.

1. The digitization of the industry

(a) Spread of connected vehicles and the arrival of autonomous vehicles

The technological revolution is producing huge and rapid advances in wireless connectivity, artificial intelligence, low-cost hardware (cameras, sensors, radars) and software that unites all these elements. Innovative firms, both car manufacturers and suppliers, as well as new participants from the technology industry, are investing heavily to deliver new applications, features and services. This dynamic is placing special emphasis on the high-end segment, led by Volkswagen, BMW and Tesla. Similarly, new prototypes of connected vehicles are starting to appear for specific applications, such as large mining trucks, robot taxis, buses printed using 3D technology, and small, low-cost urban autonomous vehicles (known as "pods").[14]

Electronics are penetrating the automotive industry as never before, and very fast (see diagram II.2). The first digital engine control modules were introduced in the 1980s. Today, an average car contains about 60 microprocessors (four times more than 10 years ago), along with over 10 million lines of software code (more than half of the number of lines of code used in a Boeing 787 Dreamliner) (CAR, 2014). A decade ago, electronics and software accounted for no more than 20% of the total cost of a vehicle; today the figure has risen to 35% (PwC, 2016g). In a state-of-the-art car with a conventional internal combustion engine, the electronic component represents about 40% of value-added, and the proportion can reach 75% in electric or hybrid vehicles (Scuro, 2017). By 2030, the cost share is likely to exceed 50% (WardsAuto, 2016). Furthermore, nearly 90% of automotive industry innovations in 2015 included electronics and software in areas related to safety, connectivity and entertainment (ConnectorSupplier, 2016).

Electronics and software account for around 35% of the total cost of a vehicle today.

The largest vehicle manufacturers, along with their suppliers, have focused on traditional areas such as quality and safety, and have used "infotainment" systems to differentiate their products.[15] Users want to be connected and have convenient to access their personal content anywhere, anytime, on all of their devices. In this scenario, cars are rapidly becoming another node in the network, allowing for more comfortable, safe and efficient journeys (see diagram II.2).

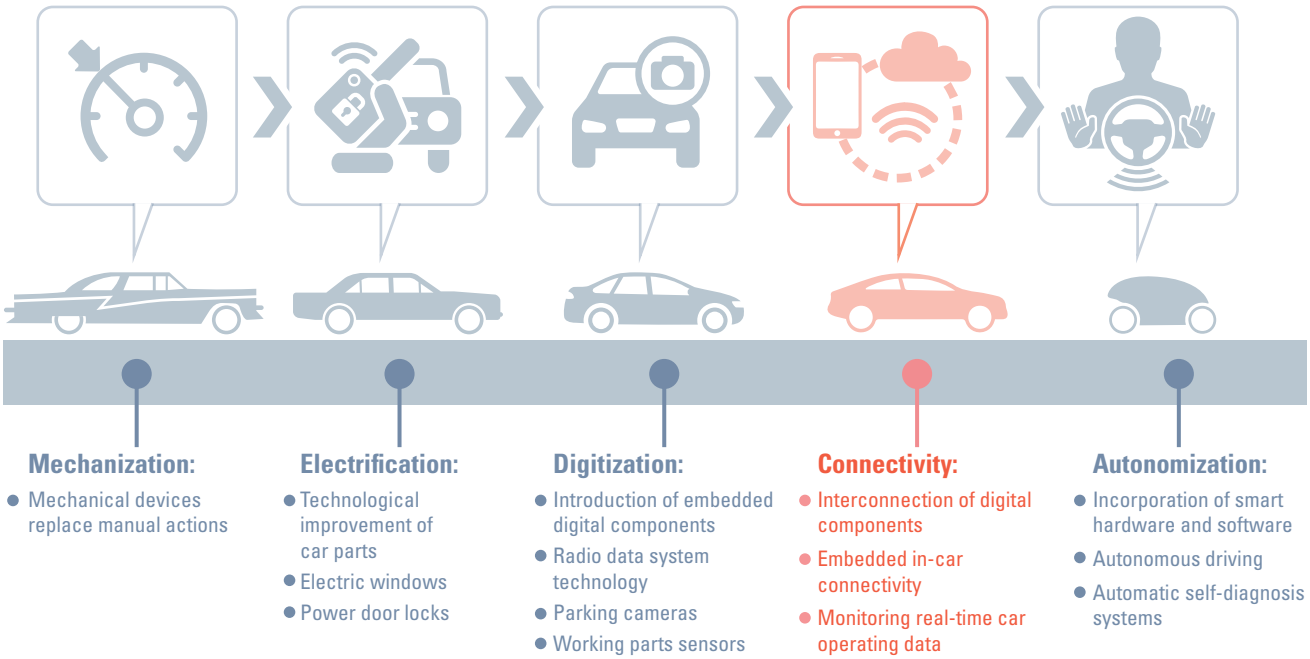
The production of connected automobiles is growing rapidly.[16] Between 2015 and 2020, the production of new cars equipped with data connectivity —via a built-in communications module or a connection to a mobile device— is forecast to increase from 6.8 million to 61 million units, or from 10% to 75% of the total (see figure II.20) (Gartner, 2016). With this rapid incorporation of intelligence, by 2018 one in every five vehicles will be able to discern and share data on their mechanical status, positioning and environmental conditions (Hewlett Packard Enterprise, 2016). The dramatic increase in vehicle connectivity will imply a significant increase in the value of the world market for components and related services, from € 30 billion to € 170 billion between 2014 and 2020 (McKinsey, 2014).

14 In mid-2016, the United States firm Local Motors presented a small self-contained, electric, 3D-printed and partially recyclable shuttle-bus called Olli. The firm claimed this was the first self-driving vehicle to use the Watson Internet of Things (IoT) cognitive learning platform, developed by International Business Machines (IBM), (The Verge, 2016a). In late 2016, NuTonomy, of Singapore, became the first company to publicly test autonomous taxis, thus beating Uber, the firm that pioneered development of this type of vehicle (The Verge, 2016b).

15 Many manufacturers have developed their own information and entertainment systems, including dashboard units, along with the software that runs them and enables them to interact with other devices, such as smartphones.

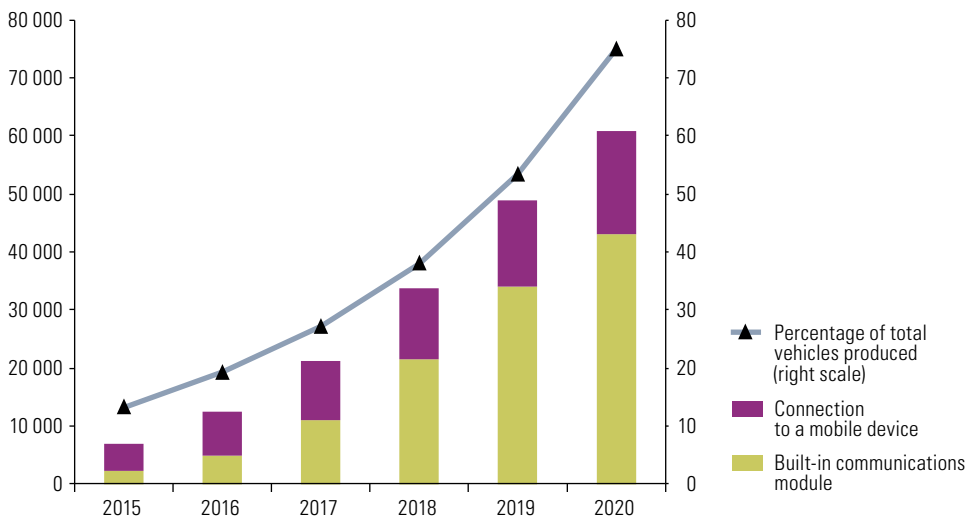
16 In addition to the basic concept of a connected vehicle with Internet access, new markets have emerged, such as vehicle-to-infrastructure (V2I), vehicle-to-vehicle (V2V), vehicle-to-the cloud (V2C) and vehicle-to-everything (V2X) (Hewlett Packard Enterprise, 2016).

Diagram II.2
Automotive industry: evolution of technology incorporation



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Statista, *Digital Market Outlook. Connected Car Market Report*, New York, March 2017.

Figure II.20
Global production of connected automobiles, by mode of connection, 2015-2020
(Thousands of units and percentages of the total)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Gartner, "Forecast: connected car production, worldwide", September 2016 [online] http://www.gartner.com/newsroom/id/3460018; Hewlett Packard Enterprise, *The Internet of Things and Connected Cars*, April 2016 [online] http://h20195.www2.hpe.com/v2/getpdf.aspx/4AA6-5105ENW.pdf?ver=1.0.

Over the next few years, in addition to selling their products, vehicle manufacturers are likely to try to grow their revenues by offering new safety, autonomous driving and connectivity services. The specific content of each of these features will change over time. The current characteristics of safety features may converge with those of autonomous driving as the latter becomes more widespread. Sales of connected vehicles could generate additional revenue that would triple over the next five years, to reach about US$ 156 billion by 2022 (PwC, 2016e) (see figure II.21). With annual growth rates of close to 30%, autonomous driving and safety will be the most dynamic features, although they will probably only gradually be incorporated into the price of new vehicles. It is also likely that a large portion of the potential of the connectivity services segment will be captured by third parties (PwC, 2016e).

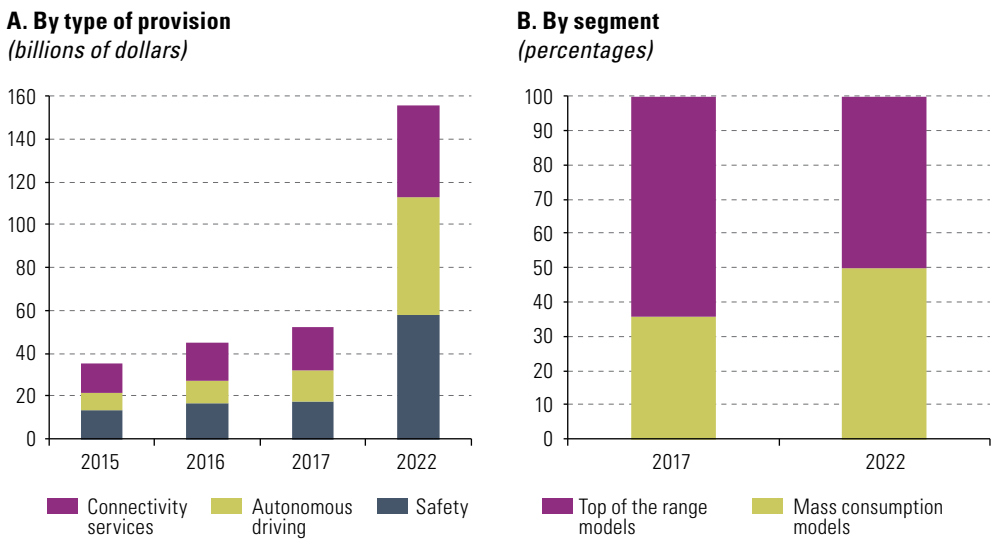


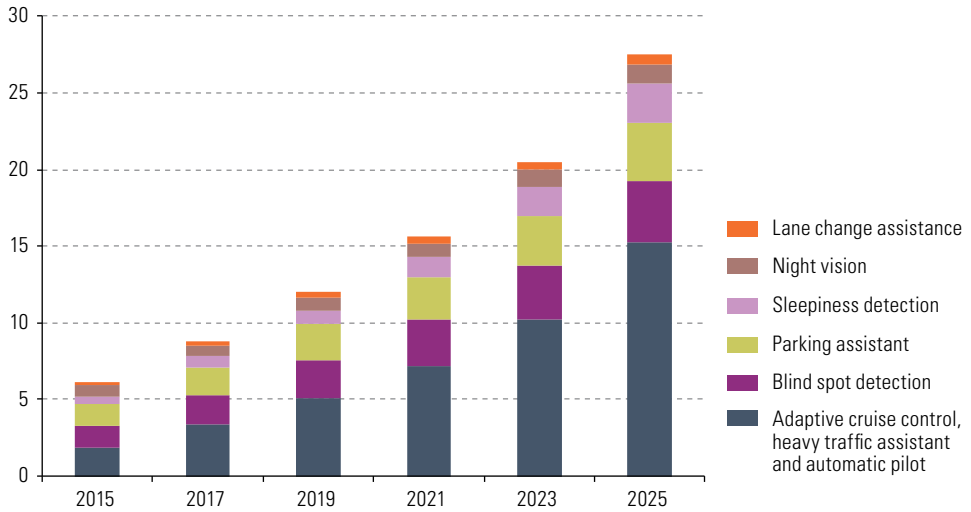
Figure II.21
Additional revenue for the global connected vehicles market, by type of feature and segment, 2015-2022

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of PwC, *Connected Car Report 2016: Opportunities, Risk, and Turmoil on the Road to Autonomous Vehicles*, 28 September 2016 [online] https://www.strategyand.pwc.com/media/file/Connected-car-report-2016.pdf.

As manufacturers have progressively incorporated sensors and telemetry systems, the information available on vehicle operation and driver behaviour has increased. At present, the vast majority of participants in the chain are interested in collecting data on both; but there is still considerable uncertainty about how to use such information. Consumers have benefited the most thus far, through easy access to a wealth of information on the prices, discounts, technical specifications and performances of products offered on the market.

The spread of connectivity means a rapid evolution towards autonomy, from simple alert-and-assist features to more comprehensive, integrated and connected systems (see diagram II.2, figure II.22 and table II.2) (Goldman Sachs, 2016). Suppliers are strengthening their capabilities in software, sensors, cameras and other components for advanced driver assistance systems (ADAS) and human-machine interface that allow the driver and passengers to interact with the vehicle's different systems —mainly on-board entertainment, connectivity and ADAS. The components market for advanced driver assistance systems is set to grow by 16% per year between 2015 and 2025, from € 6.1 billion to around € 30 billion (Roland Berger, 2016b).

Figure II.22
Revenues of the global market for advanced driver assistance systems in light vehicles, by component, 2015-2025
(Billions of euros)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Roland Berger, *Global Automotive Supplier Study 2016. Being Prepared for Uncertainties*, July 2016 [online] https://www.rolandberger.com/publications/publication_pdf/roland_berger_global_automotive_supplier_2016_final.pdf.

Table II.2
Evolution of autonomous driving

Level of automation	2010	2015	2020	2025	2030
Level 5: Driverless vehicles		Restricted tests	Small-scale cars as a service (CaaS)	Deployment of low-speed CaaS	Full deployment
Level 4: Autonomous vehicles with driver control		Restricted tests	Small-scale deployment	Volume production	Full deployment
Level 3: Conditioned automation and limited autonomous driving		Automatic pilot for highway Automatic pilot for parking Automatic pilot for dense traffic			
Level 2: Partial automation combined with autonomous functions		Parking assistant Dense traffic assistant Lane change assistance			
Nivel 1: conducción asistida en funciones específicas	Autonomous emergency braking Adaptive cruise control				
Level 0: Zero automation-normal driving	Driver warning and assistance systems				

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of M. Jackson, "The race for competitive advantage via global scale", paper presented at the Seminar UMTRI Automotive Futures: Globalization of the Auto Industry, Ann Arbor, Michigan, 13 April 2016 [online].http://www.umtri.umich.edu/sites/default/files/Mike.Jackson.IHS_.Globalization.2016.pdf; E. Juliussen, *Connected Cars: Perspectives to 2025*, IHS Automotive Technology, 27 April 2016.

Connectivity features are currently highly focused on high-end vehicles, which generate two-thirds of total revenue (see figure II.21B). Manufacturers generally launch innovative products and value-added services at the high end of the market, taking advantage of the larger margins that these types of cars allow. Nonetheless, extending connectivity to all types of vehicles will generate huge market growth and hence a noticeable drop in the prices of the features in question; it will also jeopardize differentiation strategies based on them. In the next few years, autonomous driving features are likely to become as common as airbags. Moreover, the flexibility of the new modular platforms makes it possible to rapidly incorporate technological innovations in the field of connectivity, entertainment, safety and propulsion systems (IHS, 2015). In this scenario, automobile prices are not expected to suffer many changes; those at the high end would probably rise by 4%, while prices in the mass-consumption market would be unlikely to increase by more than 1% (PwC, 2016e).

The major manufacturers and some technology companies have plans to put models with high degrees of autonomy on the market (see table II.3). Vehicles of automation levels 4 and 5 could account for 4% of light vehicle sales by 2030, rising to 16% by 2035 (Wall, 2016) (see table II.2). To this end, manufacturers and suppliers are investing increasing shares of their revenues in R&D, which allows them to patent a large number of technological innovations related to autonomous driving. Since 2010, Robert Bosch GmbH has applied for 2,710 autonomous driving patents, followed by Toyota (2,061), Volkswagen (1,173), the Japanese supplier DENSO (1,022) and Honda (882) (Automotive News, 2016a).

Table II.3
Announcements of autonomous vehicle launches, by level of automation, 2014-2021

Automation level	2014	2015	2016	2017	2018	2019	2020	2021
Level 5: Driverless vehicles					Google		Apple, Uber	BMW
Level 4: Autonomous vehicles with driver control			BMW, Mercedes-Benz, Tesla			Land Rover		Ford, GM
Level 3: Conditioned automation and limited autonomous driving							Mercedes-Benz, Audi, BMW, Volvo, Nissan, Honda, Hyundai, Toyota	
Level 2: Partial automation combined with autonomous functions	Mercedes-Benz, Audi, BMW, Lexus, Toyota, Volvo, Honda, Volkswagen		Tesla	Volvo, Nissan, Toyota, Subaru, Hyundai, Cadillac	Nissan		Subaru, Nissan	

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

Firms in Germany and Japan have gained a leading position in autonomous driving technologies. Between 2010 and 2015, the German and Japanese industries invested around € 28 billion and € 26.1 billion a year, respectively, in R&D; and a substantial part of this has been devoted to connected and autonomous driving (GTAI, 2016b; EU, 2016). Since 2010, Japanese and German automakers and component suppliers have obtained 42% and 35% of all patents on automatic driving technologies.

These figures show that the mass production of autonomous vehicles is starting to appear more clearly on the horizon, but further time is needed for it to settle. The collaborative relationships between the actors in the production chain need to consolidate, particularly the most innovative ones, in order to move towards closer integration between R&D and production, and to incorporate technologies that historically have not been on the manufacturers' radar. This can be seen especially in the advent of driver assistance technologies, a predecessor of fully autonomous driving (ThomsonReuters, 2016). The most advanced manufacturers in the development of autonomous vehicles include: Daimler AG, BMW, Volkswagen Group, Toyota, Renault-Nissan Alliance, Ford and General Motors.

Daimler AG is implementing major R&D initiatives to create autonomous vehicles. In 2014, it was the first to introduce a safety and autonomous driving system (known as "Intelligent Drive") in the Mercedes Benz S-Class, which made it an industry leader (Automotive News,

2014).[17] It has also made progress in technologies that enable the autonomous driving of trucks and communication between fleets of vehicles of this type (Highway Pilot), with commercial production set to begin in 2025 (Daimler, 2017).[18] In early 2017, Daimler AG signed a cooperation agreement with Uber to develop and produce autonomous cars that will be integrated into its global fleet (Bloomberg, 2017a). It also signed an agreement with Robert Bosch GmbH to pool efforts in the development of fully autonomous vehicles, aimed at supplying robotized taxis and shared cars at the start of the next decade. The agreement focuses on the joint development of the software and algorithms needed to make these advanced driving systems safe and predictable (Fortune, 2017a).

BMW formed an alliance with Mobileye —the leading provider of advanced driver assistance systems— and Intel, to produce a fully autonomous car by 2021, called iNEXT. In mid-2017, BMW announced that it would launch a fleet of 40 cars with this technology for testing in cities in the United States and Europe (Fortune, 2017b).

Following the emissions scandal that erupted in 2015, in mid-2016, Volkswagen launched Strategy 2025 to restructure the company, focusing on electric vehicles and autonomous driving technologies. Over the next 10 years, it plans to market about 30 fully electric vehicles and sell between 2 million and 3 million of them by 2025 (Forbes, 2016c). In early 2017, Volkswagen introduced a prototype that combines the concepts of electric vehicle, autonomous driving and shared mobility. The self-driving car, or "Sedric" will be completely autonomous, with no steering wheel or pedals; and it will have an interior designed as a small room with four seats (two facing two) (El País, 2017c). At the same time, Volkswagen's subsidiary Audi, drawing on a long collaboration with the United States enterprise Nvidia —which specializes in integrated circuits and graphics processing systems— announced the launch of an autonomous car in 2020 and exhibited a prototype (Q7 SUV) which learnt to drive alone in four days, based on Nvidia's artificial intelligence (The Verge, 2017a).

Together with BMW and Audi, Daimler AG acquired the map and navigation company HERE Technologies for US$ 3.1 billion in late 2015 (Wired, 2015). This gave the main German manufacturers a sophisticated mapping service (considered a key component for autonomous driving) and achieved greater independence from the main competitors in this service: Apple, Google, Amazon and Facebook.

Currently, Toyota is the vehicle manufacturer with the largest number of autonomous driving patents (Automotive News, 2016a). It has made the most of universities and provided funding of about US$ 50 million to the Massachusetts Institute of Technology (MIT) and Stanford University. In 2015, Toyota set up a research centre in Silicon Valley with a budget of some US$ 1 billion to speed up the development of new applications in artificial intelligence, robotics and advanced materials. The two main research lines of the Toyota Research Institute (TRI) are the Chauffeur and Guardian systems.[19] In March 2017 in California, Toyota introduced the second generation of a vehicle equipped with sensors, cameras and radar, offering various autonomous driving functions.

The major manufacturers are preparing to produce autonomous vehicles by the end of this decade.

In early 2017, Ford announced that it would produce autonomous vehicles within four years. To that end, it planned a US$ 1 billion investment in Argo AI, an enterprise founded by former Google and Uber experts, specialized in robotics and artificial intelligence, to develop the software needed for the next generation of driverless cars

[17] In the Intelligent Drive system, sensors, controls and 36 technologies are integrated and work together, resulting in driving autonomy of about 70%. Intelligent Drive includes systems to help prevent collisions, a pedestrian and animal recognition feature, lane keeping, parking assistance, rear-crash monitoring, crosswind stabilization, distance control, night vision and a suspension that automatically adjusts before the car hits an imperfection on the road. Those technologies work with 12 ultrasonic and six radar sensors and eight cameras that monitor 360 degrees of the car (Automotive News, 2014).

[18] Using cameras and radar sensors, the Highway Pilot technology analyses traffic and transmits information to the systems, controlling vehicle speed and direction. In addition, thanks to an integrated three-dimensional map, autonomously driving trucks always know where they are going (Daimler, 2017).

[19] While Chauffeur is a fully autonomous system, Guardian is a high-level assistance platform for the driver, which constantly monitors the driving environment both inside and outside the vehicle, in order to avoid collisions (Forbes, 2017a).

(The Telegraph, 2017). In partnership with Argo AI, Ford expects to develop technology that can be licensed to other players in this segment to generate additional revenue (Forbes, 2017b).

General Motors is one of the few vehicle manufacturers that has sought to develop endogenous technological capabilities, for which it has made a series of acquisitions. In early 2016, it purchased the assets of Sidecar, a mobility platform; and it invested US$ 500 million in Lyft, the Uber competitor with which it entered into a partnership to develop a private transport service with autonomous vehicles. Shortly afterwards, it bought the small-business software firm, Cruise Automation, for US$ 688 million to speed up the company's development of autonomous automobile technology. This strategy has quickly yielded good results: Cruise Automation technology prototypes are being tested in Arizona, as are those of Google. In 2018, General Motors intends to launch an autonomous version of its Chevrolet Bolt electric car, which will be used primarily by Lyft (Fortune, 2017c). Lastly, General Motors has internally developed a semiautonomous technology that will be launched on the market in its high-end Cadillac models in 2018 (Autoblog, 2017). Although the firm has been more cautious about revealing its plans, it is known that 40 Chevrolet Bolt autonomous vehicles have been tested with an engineer in the driver's seat in several cities across the United States. It is highly likely that the first autonomous cars will be used under General Motors' agreement with Lyft.

Since 2016, Nissan has been marketing the Serena model in Japan, with ProPilot technology that makes it possible to drive automatically in a lane with no hands on the steering wheel. Nissan has announced the next version of ProPilot for 2018, which will automate lane changes; and in 2020 it will launch new features capable of automating driving in even more complex environments such as intersections and urban routes. In early 2017, Nissan began testing an autonomous vehicle on various roads in Europe. The autonomous Nissan Leaf model includes millimetre-wave radar, laser scanners, cameras, high-speed computer chips and a specialized human-machine interface, among many other components. It also introduced Seamless Autonomous Mobility (SAM), a technology developed by the National Aeronautics and Space Administration (NASA), which uses artificial intelligence to help partially autonomous vehicles make decisions in unpredictable situations.

In recent months, other major manufacturers have also unveiled their plans for autonomous driving. In late 2016, the PSA Group confirmed that a fleet of 15 prototypes had travelled more than 120,000 kilometers in autonomous mode along several European highways (including a fully autonomous trip between Paris and Bordeaux). In March 2017, the firm announced the start of testing with autonomous vehicles and non-expert drivers in Paris, as part of the Autonomous Vehicles for All (AVA) programme. Following these tests, it plans to market the first semi-autonomous vehicles in 2020 (PSA Group, 2017). In addition, in early 2017, Hyundai introduced a first autonomous version of its Ioniq model, with a LiDAR system included (PCWorld, 2017).[20]

(b) New entrants: the entry of global digital platforms

The new trends are putting a strain on the entire vehicle production chain. In this turbulent scenario, changes in industry leadership are likely to occur, with the entry of new players, mainly from the technological frontier; and there will be strong pressures for traditional manufacturers to speed up and strengthen innovation initiatives in technology, corporate management and the business model. At the same time, a new generation of strategic partnerships between companies from different sectors is gathering pace.

[20] The LiDAR system is a technology that is highly coveted among the leading manufacturers. It consists of a radar-like system, which uses lasers instead of radio waves to construct a three-dimensional image of the surrounding landscape. As satellite navigation systems are only accurate to less than five meters and can easily be confused by tall buildings and glass, autonomous vehicles require a series of additional sensors to accurately position themselves and detect pedestrians, vehicles and other objects.

New players are entering the automotive industry, mainly from the cutting edge of technology.

At least two types of firm that had not previously participated in the automotive chain are now seeking to gain a strong foothold in it. First are the large technology firms, such as Google, Apple and Uber, which view the automotive industry as an attractive space to diversify and use their capabilities to develop new products and business models. Second are firms with a long track record in the electronics and software areas, such as Intel and Samsung, which are trying to position themselves in a number of critical components in the new value chain. Closer convergence and alignment between technological companies and traditional vehicle manufacturers seem inevitable.

With great secrecy, Apple invested some US$ 10 billion in R&D in its Project Titan to produce a car to compete with Tesla. It is currently thought to be working on an electric vehicle —the iCar— which should come to market by 2020 (Express Drives, 2017). Unlike other manufacturers, however, Apple has kept a low profile and has not tested its prototypes on public roads.

In the last few months there has been a lot of news about possible takeovers or partnerships involving Apple, apparently to boost and hasten development of the iCar project. Since 2015 there has been speculation about a possible cooperation agreement with German manufacturers BMW and Daimler AG, and with the new electric vehicle enterprise named Faraday Future, which has come as a surprise (Forbes, 2015, McRumors, 2015, Safe Car News, 2016). In late 2016 there was speculation about possible takeovers of British manufacturer McLaren, which has extensive experience in advanced materials (carbon fibre) and innovative technologies (touch screen controls and hybrid electric propulsion systems), and of Lit Motors, which is known for its development of a two-wheeled electric vehicle with a self-balancing system (The Verge, 2016c; Forbes, 2016d).

Nonetheless, Apple now seems to be reviewing its autonomous car vehicle strategy, since its progress does not match that achieved by its main competitors, Google and Uber. Some analysts say that Apple should focus on applications and services for the next generation of cars and abandon the project to build its own vehicle. In fact, the good results from Apple's on-board entertainment and connectivity platform leave the company well-positioned to deliver content adapted to autonomous vehicle passengers (Forbes, 2017c).[21]

In late 2016, Google grouped all activities related to the development and commercialization of an autonomous vehicle in a new company: Waymo (the name is an abbreviation of the expression "a new way forward in mobility").[22] At the same time, the new firm announced an agreement with FCA to create a fleet of 100 Chrysler Pacifica hybrid cars which Waymo will adapt to provide an autonomous taxi service. In late April 2017, FCA announced the delivery of 500 additional vehicles to Waymo to implement a pilot programme in Phoenix, Arizona. Although it is not the first initiative to provide a service with these characteristics, its main difference is the scale. Waymo has performed more road testing than any other firm, with over 4 million km driven without major incident (Forbes, 2017d). It is currently negotiating with Honda to share its autonomous driving technology (Bloomberg, 2016b). Thus, the Google programme, which began more than seven years ago, has become a catalyst behind an extremely competitive race to produce automated vehicles on a commercial basis. Google's vehicle is the most technologically advanced thus far (Forbes, 2017c).

21 In 2014, Apple launched CarPlay, a platform that integrates essential iPhone functions including calls, messages, maps, music, podcasts and audiobooks directly into a vehicle's centre console for seamless connectivity. This has been Apple's most significant move into the auto world and is widely available on most new brands of cars (Toyota being a notable exception) (Forbes, 2017c).

22 For over six years, Google's autonomous vehicle development has been assigned to Google X's Special Projects Department. With the creation of Waymo, an independent firm was established within Alphabet Inc., which will remain under the aegis of headquarters in Mountain View, California, but with more room for manoeuvre and decision-making.

In recent months, Uber has focused on the development of driverless vehicles. In late 2016, in a bid to save development time, it bought the Otto self-driving truck business for some US$ 680 million, and it announced a US$ 300 million partnership with the Chinese-Swedish manufacturer Volvo Group to develop autonomous vehicles. Uber conducted the first tests in Pittsburgh, with a model made by Ford, and continued testing in San Francisco with cars produced by the Volvo Group. At the same time, a truck with Otto's technology and a cargo of 50,000 beers travelled 200 km without a driver along Colorado highways in October 2016. Thus, an autonomous Uber truck made the first driverless commercial freight journey (Wired, 2016).

The rapid evolution of ADAS and connectivity and entertainment platforms has also encouraged technology, hardware and software companies to enter this market. For vehicle manufacturers and traditional suppliers, it is practically impossible to develop their own competitive technologies. In this scenario, major acquisitions are taking place and all types of strategic partnerships are being developed to access frontier technologies.

As part of its overall restructuring strategy, Canada's BlackBerry Limited abandoned the production of smartphones to enter the software development market. In October 2016, BlackBerry Limited and Ford announced a partnership to work on automotive technologies, particularly in the connectivity and autonomy areas (Bloomberg, 2016c). Ford will thus replace its entertainment systems —based on Microsoft's SYNC technology— with the systems manufactured by QNX, a BlackBerry subsidiary. This firm has a strong presence in the automotive market thanks to QNX's integrated on-board entertainment systems. Nonetheless, it usually licenses its software to hardware vendors who, in turn, sell products to vehicle manufacturers. Under this agreement, the Canadian firm will deal directly with the final buyer, Ford, and will become a top-tier supplier (Forbes, 2016e). This should help it build deeper relationships within the industry and establish similar agreements with other manufacturers.

The largest transaction in the semiconductor industry took place in October 2016, when the leading smartphone chip developer, Qualcomm, based in the United States, paid about US$ 46 billion for Dutch semiconductor maker NXP Semiconductors, which had been created from a division of Philips (Bloomberg, 2016d). In recent years, NXP Semiconductors has specialized in the development of hardware for on-board entertainment systems, autonomous vehicle components and devices for the Internet of Things. This purchase enables Qualcomm to strengthen its area of expertise and expand, from a position of leadership, into new markets with huge potential, such as connected vehicles and autonomous driving.

When Intel bought Mobileye, the latter had partnerships with BMW and Intel to produce an autonomous car; with the United States supplier Delphi Automotive, to develop autonomous automobiles; and with the French firm Valeo to advance the merger of front camera and sensor systems. This operation was the largest takeover of a firm exclusively dedicated to autonomous driving, and Intel will try to speed up development of this technology, combining it with a cloud-to-car solution to differentiate itself from NVIDIA Corporation and Qualcomm, which have similar technologies (ZDNet, 2017).

In March 2017, Samsung paid about US$ 8 billion for Harman International, a United States firm traditionally associated with high-end audio equipment, which has quickly become the most important and successful supplier in the entertainment systems and related services segment.[23] Currently, about 65% of Harman International's revenue comes from component supply and software development for automakers (Fortune, 2016b). To achieve this position, the firm made a series of strategic acquisitions which enabled it to upgrade its capabilities in the software, mobility, cloud processing and

[23] Over 80% of the world's luxury vehicles (including Audi, BMW, Ferrari, Hyundai, Lexus, Mercedes-Benz, Porsche AG and Toyota) are powered by Harman International automotive technologies.

cybersecurity areas, all key technologies that made it possible to achieve a position of leadership in the dynamic connected vehicles market.[24] With this purchase —the largest by a South Korean company abroad— and unlike Apple and Google, Samsung is not looking to build a platform to manufacture connected and autonomous vehicles, at least in the short term; instead it is focusing on a less risky and possibly more profitable option, namely the hardware.

There is also space in the new motor vehicle industry for innovative SMEs.

However, the story does not end here. In recent months, several small firms have appeared —generally emerging enterprises based in Silicon Valley and led by former employees of some of the major technology companies, such as Google, Apple and Uber— which have been working on autonomous driving software and hardware. Their aim is to develop new products, applications or services that can be licensed; and they have met a highly positive response from venture capitalists. The most successful enterprises include:

- Zoox, which for two or three years has been working to build an autonomous vehicle. At present, it is developing an electric and autonomous prototype for use in a private transport service (ride-hail service). In late 2016, it completed a successful fundraising round of US$ 250 million, bringing its market value to more than US$ 1.5 billion (Financial Review, 2016). This enterprise is particularly interesting as it is progressing, without any known partnerships, in several different areas: vehicle construction, software development for autonomous driving, and the deployment of a ride-hail platform (Business Insider, 2016).
- Drive.ai, which has specialized in the development of deep learning software, a category of automatic learning, for autonomous driving. By late 2016 it had raised about US$ 12 million and entered into several partnerships with ride-hail firms (Reuters, 2016a).
- NuTonomy, an MIT spin-off enterprise based in Singapore and Massachusetts, which has made remarkable progress in mobile robotics and autonomous driving, challenging Uber, its primary competitor. In May 2016, it received investments of around US$ 16 million from firms and institutions in Singapore to develop an autonomous on-demand transport service. A few months later, it started testing in Singapore with six driverless taxis, carrying passengers under real conditions. During the trial period, users have to pre-register; the journeys are free, with pre-set pick-up and delivery locations; and they must be ordered through an application on a smartphone. NuTonomy engineers also travel in the vehicles, collecting data on the experience and, if necessary, taking control of the car. The firm expects to start offering the service to the general public in 2018 (La Vanguardia, 2016a). In addition to operating in Singapore, NuTonomy is working on other, more embryonic, ventures in Michigan (United States) and the United Kingdom, in collaboration with the British-Indian firm Jaguar Land Rover. In May 2017, NuTonomy entered into an agreement with the PSA Group to incorporate its autonomous driving technology into the new Peugeot 3008 SUV model and test it on the open road in Singapore, starting in September. This partnership would also make it possible to evaluate an on-demand autonomous mobility service in an urban environment, which is included in the PSA Group's strategic plan (Autonomous Vehicles for All) (PSA Group, 2017).

[24] The firms taken over include the following: the automotive division of the Danish company Bang & Olufsen, supplier of audio products for luxury car manufacturers (US$ 156 million); S1nn GmbH & Co. KG, German developer of information and entertainment systems, connectivity and audio solutions for cars (US$ 50 million); Symphony Teleca, Indian-American provider of global software services (US$ 780 million); and Redbend Software and TowerSec, two Israeli firms specializing in cybersecurity (US$ 170 million and US$ 75 million, respectively).

- Nuro.ai, which seeks to exploit the automatic learning and robotic capabilities of its founders at Google to develop products that allow completely autonomous driving within two to four years (Recode, 2016).

Digital technology firms are not only supplying new products and services to manufacturers, but they are also gaining space in the basic technologies that enable vehicles to function, thereby altering the industry's traditional value chain.

Autonomous driving poses new regulatory challenges.

At the same time, with progress in driver-assistance systems, the first regulations started to appear aimed to ensuring the safety of autonomous driving and enable drivers, pedestrians and vehicles to coexist in mutual harmony. These regulatory changes have been announced in the countries of origin of the companies that are spearheading the innovations in question: Germany, the United States and Japan. In the United States, 33 states have started to legislate on this subject, and 13 of them have passed laws on autonomous vehicles. Nevada was the first to authorize the operation of autonomous vehicles in 2011. In late 2015, California —one of the most advanced states in this area— required tests of autonomous vehicles to have a duly authorized person on board, who could take back control and would be held liable in the event of a traffic accident. In early 2017, the Californian authorities relaxed the regulations and allowed testing to be performed without human control (Bloomberg, 2017b). At the same time, Germany has launched a reform of traffic legislation to allow automatic systems to take control of the vehicle, although the driver will retain responsibility in the event of an accident (CleanTechnica, 2017).

2. Mobility, connectivity and new patterns of consumption

The mobility systems of the future will be very different from those of today. Several of the current technological trends —ranging from energy decentralization to the Internet of Things and artificial intelligence— will converge to drastically change mobility systems.[25] The individual traveller will be at the centre of this evolution, so consumers will need to be open to the adoption of new technologies and services (McKinsey & Company, 2016). Two sets of factors that point in this direction are listed below.

- There are new forms of mobility that are gaining an increasing presence in the market: electric vehicles, shared mobility and autonomous driving. Lower battery costs, increased autonomy, and upgraded charging infrastructure have boosted sales of electric vehicles (Mc Kinsey & Company, 2017). Shared car services, hourly or by-the-minute car rentals, and private transport services already operate in many cities around the world, are available in smartphone applications and are heavily backed by venture capital. Moreover, a large number of vehicle manufacturers, suppliers, technology firms and innovative start-ups are rapidly moving towards autonomous driving.
- There are other, equally important, trends in mutually reinforcing areas related to mobility. Between 2016 and 2030, the proportion of the world's population living in urban areas is forecast to increase from 54.5% to 60%, thereby putting extra pressure on services as demand increases (United Nations, 2016). Against this backdrop, the authorities are starting to attach more importance to issues such as habitability and sustainability. At the same time, the emergence of the

[25] At present, the vast majority of energy systems are centralized; in other words large power plants generate the energy which is then transported to distribution centres and from there to each individual consumer. This system has been useful, but suffers from problems of efficiency, cost and environmental sustainability. To overcome these difficulties, a new paradigm is emerging based on the need to be sustainable, efficient, reliable and have the lowest possible cost. Non-conventional renewable energies make it possible to generate on a small scale, which gives rise to the concept of distributed generation.

new technologies is being matched by alternatives such as shared mobility and electric vehicles, which could mitigate the congestion and pollution in large cities. This scenario will favour cleaner transport systems based on electric vehicles, while discouraging the ownership and use of private cars. These measures would optimize shared mobility and expand public transport (McKinsey & Company, 2016).

The preferences and interests of potential buyers are changing radically. Consumers' "loyalty" to individual brands is weakening, and automobiles are increasingly valued as a means of transport. This trend seems to be exacerbated among the inhabitants of large cities in developed countries, where car ownership is starting to lose importance in their preferences. This is reinforced by growing problems of affordability, especially among younger generations. Vehicle ownership is becoming less attractive for millennials, since it is a costly and underused asset that quickly depreciates (BCG, 2016a). This is likely to increase the number of people who would prefer to pay to drive alone only when they need to.

These changes in consumption patterns are unlikely to radically change the size of the market, but they will change how much the consumer is willing to pay for a vehicle.[26] In recent years, the automotive industry has seen major quality improvements across the board, which have narrowed the gap between mass-consumption and luxury products. This trend, coupled with the increased demands of consumers, has allowed sophisticated components to become standard features of the new models in more economical demand segments.

The emergence of automobile transport service platforms has had disruptive effects in sectors with a long history, and has generated fierce opposition from taxi drivers wherever they operate. Founded in 2009 and a pioneer in the sharing economy, Uber has become the most valuable start-up enterprise in the world, with a market capitalization of over US$ 70 billion. The Uber application can be used in more than 60 countries and in 425 cities around the world. The firm's high valuation is based on its ambitious objectives: to use autonomous vehicles and thus make trips in Uber cheap and convenient, with the ultimate aim of consumers completely renouncing car ownership (The Economist, 2016a). In a short time, many technology companies, including Lyft, Curb, China's Didi Chuxing and Cabify, have started to emulate Uber's business model.

The manufacturers are starting to adapt to this new reality. Taking advantage of the proliferation of connectivity, many are seeking to diversify and reinvent themselves to evolve from vehicle assemblers to mobility companies (The Economist, 2016b). In recent months, some of the largest manufacturers have turned their attention to ride-hailing services (chauffeur-driven car reservation through a smartphone app) and car sharing:

- General Motors invested US$ 500 million in Lyft —Uber's main competitor in the United States, with a market value of US$ 5.5 billion— to develop an ride-hail service with autonomous cars (Bloomberg, 2016c).
- Volkswagen announced a US$ 300 million investment in Gett, an Israeli firm that is very popular in Europe, in an agreement that envisages expansion in the United States, where it acquired the private transport service Juno for US$ 250 million (Fortune, 2017d).
- Toyota made a small investment in Uber and a strategic investment in United States-based Getaround car sharing enterprise, to develop a mobility services platform and a smart key box that makes it possible to open or close doors and start the engine with a mobile phone.

[26] Shared transport services could reduce automobile demand by about 550,000 units and cause a net revenue loss of US$ 7.4 billion for automakers (BCG, 2016b).

- Daimler AG set up its Moovel subsidiary to address the new challenges of urban mobility, and developed the sophisticated Car2Go car rental service. It also acquired the RideScout taxi booking service in the United States and Germany's Mytaxi, which later merged with its UK partner, Hailo, to become the European leader in private passenger transport applications. More recently it invested in Uber's German competitor Blacklane (Bloomberg, 2014, 2016f and 2016g; Forbes, 2016f).
- BMW has invested in several companies linked to the mobility business, including: Ridecell, a leading provider of software to promote mobility as a service (MaaS), including automobile services and shared travel (BMW Group, 2016b); JustPark and ZIRX, parking location services (Business Insider, 2015); Moovit, a public transport application and mapping service (BMW Group, 2015); and Zendrive, a firm that uses data and analytics to improve driving (BMW Group, 2014). Since 2011, the German manufacturer has invested in DriveNow, a firm that provides temporary vehicle use services in several European cities and under the name ReachNow in the United States. It recently also invested in the emerging United States firms Scoop and Summon: in the former to develop a platform enabling people living in the same neighbourhood or working nearby to contact each other for car sharing; and in the latter to offer chauffeur-driven car reservation services via a smartphone application, which recently moved from India to San Francisco (Fortune, 2016c).
- In some cases, these agreements allow manufacturers to supply vehicles to mobility platforms. Examples are Toyota and General Motors, which have designed a financing mechanism enabling Uber and Lyft drivers to purchase their vehicles.

To shift the balance from ownership to use, automakers need to change their mode of operation. Thus far, their dominance of the automobile manufacturing business has kept competitors at bay; but they often lack the skills needed to address new service areas that rely on constant interaction with customers and the handling large amounts of information. Thus, the momentum demonstrated by manufacturers in their recent investments in mobility services probably reflects their need to learn how these new business segments work and benefit, as much as possible, in the short run.

Enterprises based exclusively on data management and sales services can hit limits, especially given the spread of platforms combining the digital domain with in-house or outsourced manufacturing capabilities. Google is moving ahead in the production of an autonomous vehicle, followed closely by Apple, which is also exploring options in the private transport market following an investment of about US$ 1 billion in Didi Chuxing, the largest Chinese platform (Fortune, 2016d). There are also several start-ups looking for innovative formulas enabling rapid generalization of mobility services (The Economist, 2016b).

In the future, more efficient use of public transport, growth of shared cars and the increasing number of journeys made by private transport services will discourage vehicle sales and confront vehicle manufacturers with a more dynamic scenario or even a fall in demand.

Electromobility and the new materials will become more prominent and generate significant changes in the automotive value chain.

3. A regulatory context for sustainability

Vehicle manufacturers will start to target their innovation effort on areas such as the environment and energy efficiency. Moreover, electromobility and the new materials for light vehicles will become more prominent and generate significant changes in the industry value chain. Nonetheless, these changes will not mean a reduction in cost pressure, as consumers will demand better-quality vehicles with more features; and the authorities will demand safer and more efficient cars. However, given the strong competition, it will be hard, or even impossible, to compensate for these increases by raising vehicle prices.

Laws, regulations and policies tend to lag behind technological progress, at least at the start of a new phase. In the automotive industry, for example, seatbelts started to appear in vehicles in the late 1940s, but they first became mandatory only 20 years later, under a law passed in Australia in 1970. At the present time, regulations are starting to change in several areas, and standards are being introduced that reflect technological changes, increased awareness and concern for the environment, and the need to advance energy efficiency. Many countries have also implemented emission-limiting standards and have started to deploy various zero-emission mobility models. At the same time, the rapid emergence and consolidation of new technological paradigms makes various instruments available to tackle these challenges (ECLAC, 2016).[27]

In the last few years, manufacturers and suppliers have been adapting to new standards and have made progress on various aspects of conventional vehicles. Firstly, there have been major improvements in energy efficiency and in cutting emissions from internal combustion engines. Secondly, new materials have been incorporated that reduce vehicle weight and hence the consumption of fossil fuels. If manufacturers fail to comply with the regulations, they may face harsh penalties and a serious deterioration of their image and prestige with consumers. This happened with Volkswagen when, in September 2015, it was found to have installed software to change the results of pollutant emission controls on more than 10 million diesel-powered cars sold between 2009 and 2015 (The Guardian, 2015).

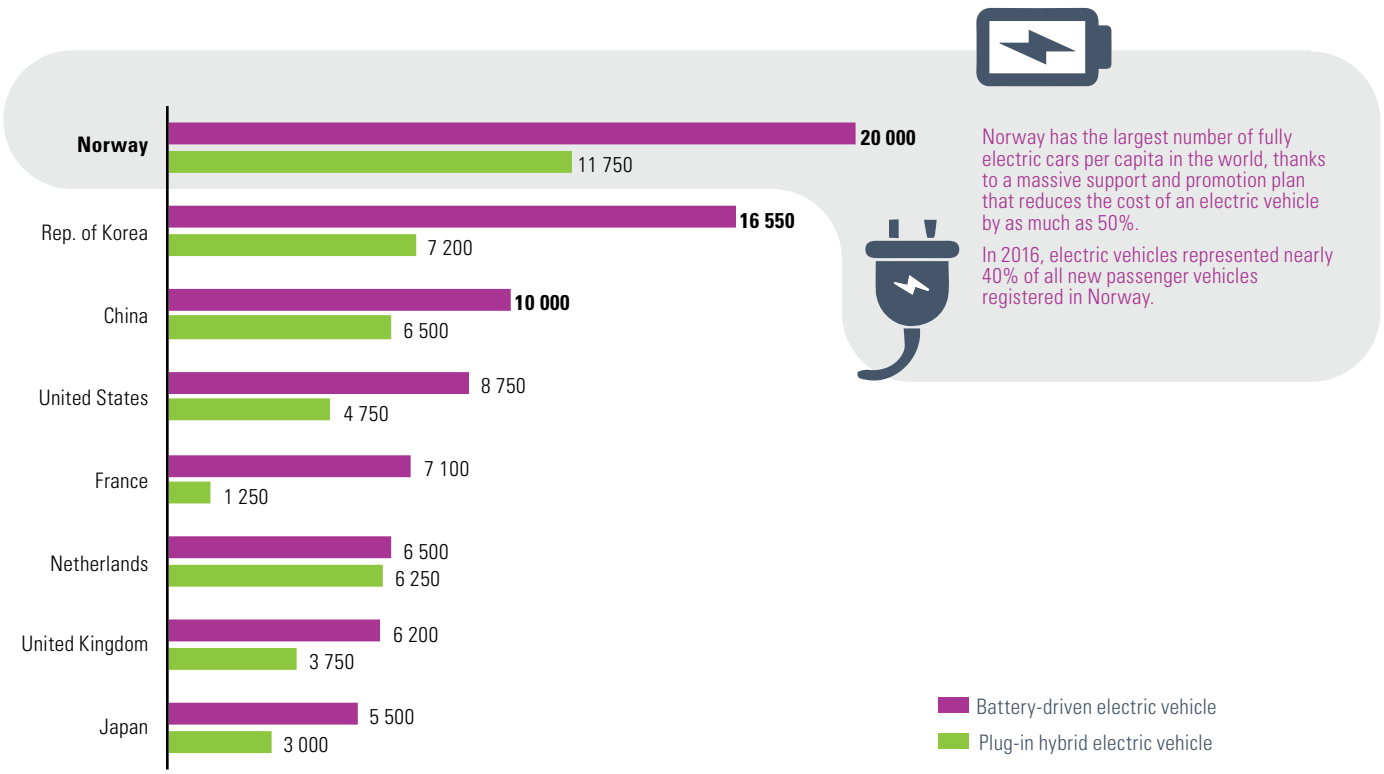
In this context, electric vehicles are starting to be seen as one of the most attractive alternatives. Electric propulsion is probably the fastest growing segment in production, despite uncertainty regarding the acceptance of this technology on the world market. Electric vehicles have benefits associated with pollution reduction, energy diversification and climate change mitigation, as well as lower operating costs than their internal-combustion counterpart.[28] The most serious obstacles to wider adoption of electric vehicles are the limitations and high cost of autonomy (attributed to energy storage technologies), poor accessibility to recharging infrastructure and its high cost, and lack of awareness of the technology, or confidence in it (IEA, 2016).

Technological progress and cost reduction coupled with generous purchase subsidies have boosted electric vehicle sales (see figure II.23). For example, Norway and Germany propose banning the sale of vehicles that use gasoline and diesel engines from 2025 and 2030, respectively. As a result of a massive support and promotion plan that reduces the cost of an electric car by up to 50%, Norway has the world's largest number of fully electric cars per capita. By 2016, electric vehicles represented nearly 40% of all new passenger vehicles registered in the country (The Guardian, 2017).

[27] The search for a new development paradigm through the 2030 Agenda for Sustainable Development and the Sustainable Development Goals, together with the need to address the effects of climate change through the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC), are evidence of the growing awareness of these global problems.

[28] Assuming current electricity and fuel taxation, a 100-km trip would cost about one fourth to one-fifth of the cost of using a car powered by a conventional internal combustion engine in Europe, and roughly half in the United States. Over five years, this would generate fuel savings of over US$ 3,000 in Europe, and about US$ 2,000 in the United States (IEA, 2016).

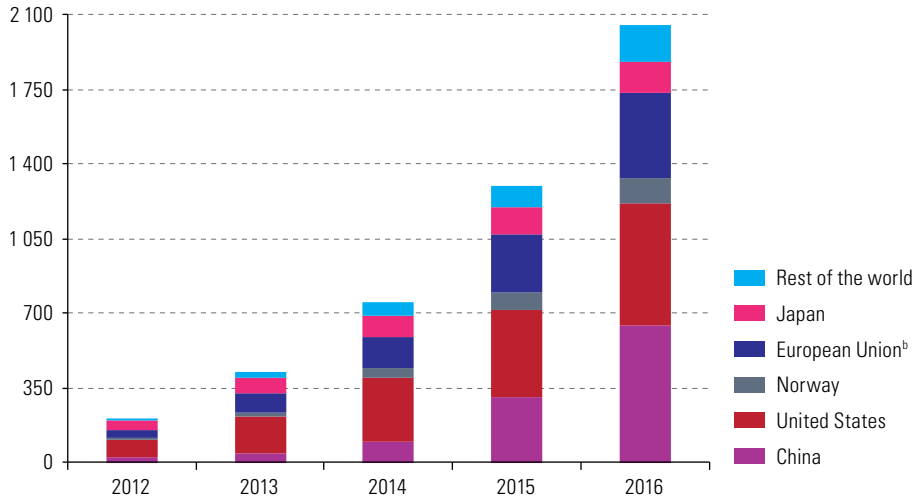
Figure II.23
Selected countries: national subsidies to purchase an electric vehicle, by type, 2016
(Dollars per vehicle)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Energy Agency (IEA), *Global EV Outlook 2016: Beyond One Million Electric Cars*, Paris, May 2016 [online] https://www.iea.org/publications/freepublications/publication/Global_EV_Outlook_2016.pdf.

Electric vehicle sales of have grown rapidly from about 130,000 units in 2012 to some 770,000 units in 2016, representing about 0.85% of the global vehicle market. There are now more than 2 million electric vehicles operating around the world, led by China with about 650,000 units. Between 2014 and 2016, the Chinese electric car market expanded more than sixfold in what was the world's highest growth rate. In the same period, the number of manufacturers in this segment (with more than 100 units sold) rose from 14 to 21, and the number of models available increased from 29 to 68 (EV Volumes, 2017). These results are based on a plan that requires all manufacturers to ensure that at least 8% of their production consists of electric vehicles by 2018, to attain the goal of about 5 million units in circulation by 2020 (Fortune, 2017f). Second placed is the United States with about 570,000 units, where interest in electric vehicles is expected to continue to grow strongly. This is demonstrated by the spectacular response to the announcement of Tesla's new Model 3 in April 2016, which will be available in 2017. This vehicle has a base price of US$ 35,000, for which about 400,000 reservations were made with a deposit of US$ 1,000 in the first 20 days following the announcement (Forbes, 2017e). In third place comes Japan, followed by Norway, surprisingly given its size, and then the Netherlands, France and the United Kingdom. The impact of electric vehicles on the population, however, remains barely noticeable in most countries (see figure II.24).

Figure II.24
Trend in the global stock of electric vehicles,[a] by selected region and country, 2012-2016
(Thousands of units)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Energy Agency (IEA), *Global EV Outlook 2016: Beyond One Million Electric Cars*, Paris, May 2016 [online] https://www.iea.org/publications/freepublications/publication/Global_EV_Outlook_2016.pdf.

[a] Includes battery-powered electric vehicles and plug-in hybrid electric vehicles.

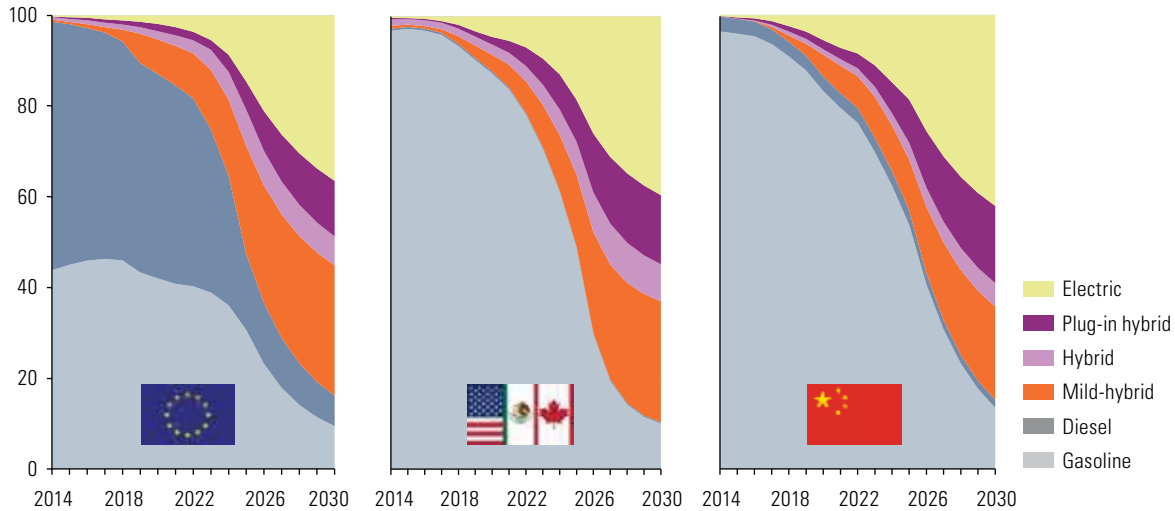
[b] Germany, France, Netherlands, the United Kingdom and Sweden.

The rapid fall in the prices of lithium-ion batteries has been one of the key factors driving the sales of electric vehicles. Batteries currently account for one-third of the cost of producing an electric vehicle (Bloomberg, 2016h). Between 2010 and 2016, their average price dropped by about 80%, from US$ 1,000 per kWh to US$ 227 per kWh (McKinsey & Company, 2017). Prices are set to fall further, as the industry scales up and improvements are made in battery chemistry and management systems; and they are forecast to be below US$ 190 per kWh by the end of the decade and under US$ 100 per kWh in 2030 (McKinsey & Company/Bloomberg, 2016). These developments would make electric vehicles competitive with their conventional internal-combustion counterparts by the mid-2020s. These forecasts could be more optimistic for high-use vehicles such as delivery fleets and taxis.

The expectation is that 2025 will inaugurate an era of change (see figure II.25). After a slow start, hybrids are forecast to gain momentum after 2020, although they will be seen as a transient technology. A little later, electric vehicles will become the dominant technology in the long run (PwC, 2016h). Long-range electric vehicles are expected to cost about US$ 22,000 by 2040; and 35% of new vehicles worldwide will have a power socket (BNEF, 2016).

One of the most serious obstacles noted by consumers is the limited autonomy of electric vehicles. Nonetheless, significant progress has been made recently in this area. Between 2013 and 2017, two of the most popular models —the Nissan Leaf and the Tesla S— extended their range by 75 to 107 miles and by 208 to 249 miles, respectively (McKinsey & Company, 2017). Part of this constraint is starting to be overcome with the accelerated roll-out of electric-vehicle charging infrastructure. Some projections suggest that the number of public and private facilities around the world could increase from about 1 million in 2014 to 12.7 million in 2020 (IHS Markit, 2015). In developed countries, governments and several manufacturers are investing heavily in freight infrastructure. In the United States, for example, as part of the sanctions it received following the emissions scandal, Volkswagen is committed to investing US$ 2 billion over the next 10 years in electric vehicle recharging stations (Forbes, 2017f).

Figure II.25
European Union, North America and China: share of propulsion systems in vehicle sales, 2014-2030
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Centre for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW), "Electromobility", Stuttgart, 2017 [online] https://www.zsw-bw.de/en/media-centre/data-service.html#c6700.

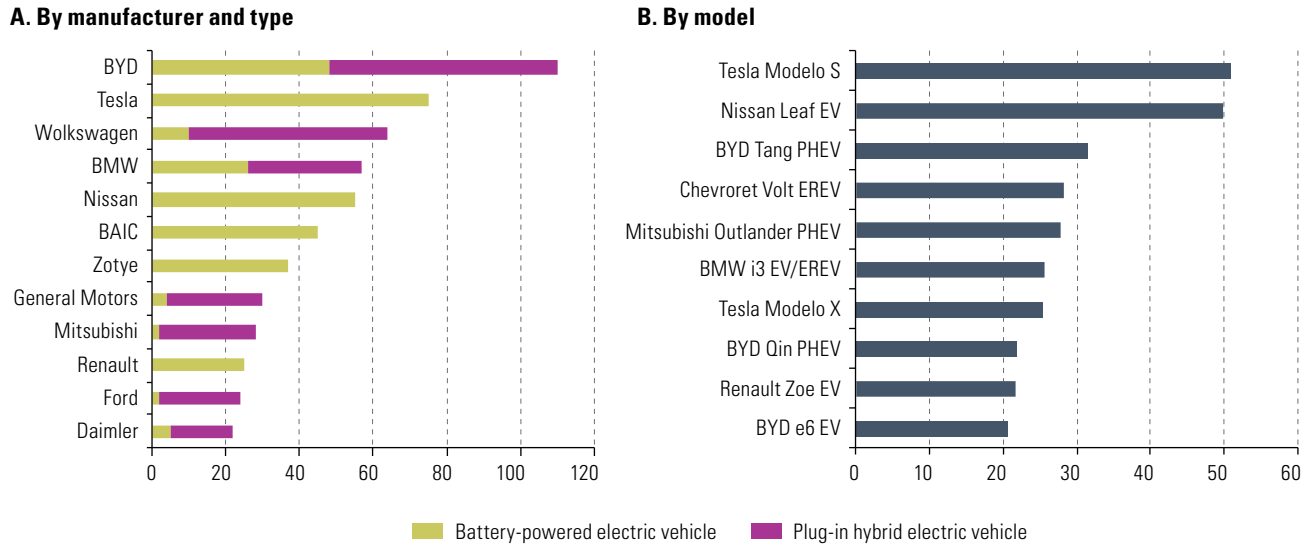
The Tesla S and Nissan Leaf models were the top-selling electric cars in the world in 2016 (see figure II.26B). These two manufacturers, although starting from different strategies, now seem to be converging. In late 2010, the launch of the Nissan Leaf set out to seduce the mass market and quickly became the best selling electric car with more than 200,000 units sold. In addition, thanks to a sustained R&D effort with Renault, the company upgraded the model's performance: the 2016 version of the Nissan Leaf incorporated a new battery that increased autonomy by 20% (Nissan, 2016). Tesla, for its part, has successfully targeted the high-end market. Nonetheless, the spectacular response to the launch of the Tesla Model 3, which has become the most desired car in history, could be a turning point in the electric vehicle market, by taking them out of the high-end niche market to speed up their universalization.

Taking advantage of strong local market dynamics and generous government incentives, Chinese automaker BYD Auto topped the 2016 global electric vehicle sales ranking, surpassing 100,000 units (see figure II.27A). With three models among the best-selling vehicles in the world and 30% of the electric vehicle market, BYD Auto is the standout market leader in China, outperforming other manufacturers such as BAIC Automotive Group, Zotye, Chery, Zhidou, SAIC Motor Corporation, JAC Motors, Geely, Lifan Group, Dongfeng Motor Corporation and Changan Motors (EV-Sales, 2017).

Along the same lines, the Swedish-Chinese manufacturer Volvo became the first large automaker to announce the end of its production with conventional engines. In July 2017, Volvo announced that from 2019 it would only manufacture cars with electric and hybrid engines. Between that year and 2021, the Swedish-Chinese firm will launch five models of electric cars, two of them high-performance (Forbes, 2017g).

The most important European companies by volume are Volkswagen and BMW. Both have focused on plug-in hybrid electric vehicles, with small batteries and little autonomy. This type of vehicle, which has evolved from conventional models with an internal combustion engine, has been highly encouraged in some European countries and can be an interesting transition alternative (by offering electric autonomy for the city and a gasoline/diesel backup for longer journeys). Nissan, for its part, has taken the opposite approach: developing a totally electric vehicle from scratch.

Figure II.26
Electric vehicles: sales by manufacturer, type and model, 2016
(Thousands of units)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of EV Volumes, "Global plug-in sales for 2016", 2017 [online] http://www.ev-volumes.com/country/total-world-plug-in-vehicle-volumes/.

Tesla's good results could change the electric vehicle market. With the success of Model 3, orders far exceeded the company's capacity (76,230 units in 2016), and it announced it would scale up its production to 500,000 units by 2018 (nearly six times the 2016 level). With an R&D intensity more than double that of other manufacturers (see figure II.16B), Tesla is likely to leave the high-priced electric vehicle niche and reinvent itself as a large-volume manufacturer. Recent developments have boosted its market capitalization to over US$ 51 billion, more than General Motors (US$ 50.9 billion) and Ford (US$ 44.8 billion) (Fortune, 2017f). Alongside Tesla, firms such as General Motors and Nissan continue to move forward in improving their electric vehicles, increasing their autonomy and targeting the mass-consumption segment, with vehicles priced in the range of US$ 30,000 and below.

F. An industry between technological upheaval and the redefinition of global leadership

The automotive industry is in the midst of a far-reaching transformation, serving as a catalyst and driver of major technological and productive changes, which represents a genuine industrial upheaval. Although vehicle manufacturers have been leading this process for many decades, suppliers of parts, components and accessories have recently become increasingly important in the production chain, powering technological development.

In stylized terms, the industry is concentrated in three macroregions: North America, the European Union and Asia. Five countries maintain strong hegemony in terms of production, vehicle manufacturing, supply and technological development: the United States, Germany, Japan, Republic of Korea and China. The first three of these have dominated the industry for decades, but China has been growing rapidly and has now become the world's largest vehicle producer.

In this context, fierce competition, consumer pressure and rapid technological progress have favoured the consolidation of manufacturers and suppliers, the emergence of new alliances between firms in the production chain and with enterprises from other industries, and the need to deploy flexible production models that offer consumers a wide range of alternatives.

In the production sphere, new platforms are appearing that combine large-scale manufacturing with increasing flexibility. The leading manufacturers are expected to concentrate about 80% of their global production on three to five of these new modular platforms. Manufacturers are thus trapped in an exclusion dynamic, where they require more and better features, with a high innovation and technology content, to maintain their market position. Their concentration in areas of specialization will enhance the importance of suppliers in the chain.

The automotive industry is expanding and its frontiers are dissolving, and innovative products and business models are emerging.

This dynamic is forcing firms to increase funding for research, development and innovation. In fact, 5 of the 20 firms that invest the most in R&D worldwide are in the automotive sector. While manufacturers invest an average of around 5% of their sales in R&D, suppliers of parts, accessories and components have an R&D intensity of close to 10%. Supplier firms thus try to satisfy the manufacturers' demanding requirements in order to hold on to the contracts signed between them.

Despite the good results achieved by the industry since the 2008 financial crisis, it now faces new, potentially disruptive challenges that could greatly alter the structure of the sector in the near future. There are at least three major trends that will determine its dynamic in the coming years: convergence with the digital economy, changes in the concept of mobility and in consumption patterns, and regulatory requirements in the fields of safety, the environment and energy efficiency.

Faced with these changes, the broader industry market is also set to change significantly. Between 2015 and 2030, while the share of vehicle sales can be expected to fall from 50% to 28%, shared mobility services will grow from 0% to 20%. Traditional suppliers will see their market share decline from 10% to 3%, while suppliers of new technologies, electronics and software will grow theirs from 1% to 10%.

The industry is experiencing colossal disruption in which electronics, digitization and software are the key elements. A vehicle today has about 60 microprocessors, four times more than a decade ago. In 2005, electronics and software accounted for about 20% of the total cost of a vehicle; today this figure reaches 35% and is expected to be over 50% by 2030, and as much as 75% in the case of electric vehicles.

The incorporation of digital technologies in vehicles allows for rapid progress in connectivity and autonomous driving. About 75% of the new vehicles sold in 2020 are expected to be connected. The rapid spread of these features will help lower their cost and incorporate them into most vehicles, regardless of the sale price. While many of these features are currently limited to high-end models, which use them as a differentiating factor, they will quickly become generalized and extended to mass-market vehicles. In a context of strong competition, the incorporation of new technologies will not necessarily translate into higher prices.

Autonomous driving is also spreading rapidly. The great majority of the major manufacturers are announcing new models with a high degree of automation by 2020. Although German and Japanese firms are at the forefront in this area, United States manufacturers also aim to gain a major stake. These advances are attracting digital platforms that have not previously shown interest in the automotive industry. Examples include Apple, Google, Uber, Intel and Samsung, which are becoming involved in different areas, from vehicle manufacture to the development of components and services linked to connectivity and autonomous driving.

These advances, coupled with other macro trends, such as overpopulation, congestion in large cities and pollution, are changing consumption patterns and the regulatory requirements facing the industry. Firstly, manufacturers see consumer loyalty weakening, as people begin to doubt the urgency of purchasing a vehicle or even the need. Against this backdrop, many firms are expanding the frontiers of the industry and entering new shared mobility and private transport services. Secondly, technological progress (mainly in batteries) and public policies that seek to mitigate the effects of climate change are driving the development of electromobility. Some countries, led by China, Norway and the United States, have introduced incentives that help overcome consumer fears about electric vehicles: low autonomy, high prices, and sparse recharging infrastructure.

In short, the automotive industry is experiencing the greatest revolution in its history since the universalization of the Fordist assembly line: the frontiers of the sector are expanding and dissolving; new products and business models are emerging that were unimaginable two decades ago. The convergence between traditional manufacturing and digitization is shifting the structure of the production chain and leaderships within it. Although expectations surrounding the new forms of mobility and the role of the automotive industry are positive, they will be processed in contexts of great economic, technological and organizational uncertainty, both in the business world and in the global economy.

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Anexo II.A1

Table II.A1.1
Vehicle production, selected countries and regions, 2000-2016
(Thousands of units)

	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
NAFTA[a]	**17 697**	**16 319**	**15 882**	**15 455**	**12 922**	**8 761**	**12 154**	**13 478**	**15 801**	**16 501**	**17 423**	**17 955**	**18 166**
United States	12 800	11 947	11 264	10 781	8 672	5 709	7 743	8 662	10 336	11 066	11 661	12 106	12 198
Canada	2 962	2 688	2 572	2 579	2 082	1 490	2 068	2 135	2 463	2 380	2 394	2 283	2 370
Mexico	1 936	1 684	2 046	2 095	2 168	1 561	2 342	2 681	3 002	3 055	3 368	3 565	3 597
South America	**2 087**	**2 990**	**3 212**	**3 805**	**4 020**	**3 851**	**4 267**	**4 391**	**4 366**	**4 667**	**3 861**	**3 008**	**2 688**
Argentina	340	320	432	545	597	513	717	829	764	791	617	527	473
Brazil	1 682	2 531	2 611	2 977	3 216	3 183	3 382	3 408	3 403	3 712	3 146	2 429	2 156
Chile	5	7	7	11	9	3	5	0	0	0	0	0	0
Colombia	24	55	71	74	34	25	37	28	71	77	71	78	79
Ecuador	1	25	25	26	29	15	22	24	24	15	6	5	0
Peru	0	0	0	0	0	0	0	0	0	0	0	0	0
Uruguay	14	0	0	0	0	0	0	0	0	0	0	0	0
Venezuela (Bolivarian Republic of)	21	52	66	172	135	112	104	102	104	72	20	18	3
European Union (EU) (28 countries)	**17 142**	**18 385**	**18 698**	**19 725**	**18 439**	**15 290**	**17 079**	**20 954**	**16 276**	**16 318**	**17 127**	**18 254**	**18 809**
Czechia	455	602	855	938	946	983	1 076	1 200	1 179	1 133	1 251	1 247	1 350
France	3 348	3 549	3 169	3 016	2 569	2 048	2 229	2 243	1 968	1 740	1 821	1 972	2 082
Germany	5 527	5 758	5 820	6 213	6 041	5 210	5 906	6 147	5 649	5 718	5 908	6 033	6 063
Italy	1 738	1 038	1 212	1 284	1 024	843	838	790	672	658	698	1 014	1 104
Poland	505	613	715	793	951	879	869	838	655	590	594	661	682
Slovakia	182	218	295	571	576	461	562	640	927	975	971	1 039	1 040
Spain	3 033	2 753	2 777	2 890	2 542	2 170	2 388	2 373	1 979	2 163	2 403	2 733	2 886
United Kingdom	1 814	1 803	1 648	1 750	1 650	1 090	1 393	1 464	1 577	1 598	1 599	1 682	1 817
Other European Union countries	540	2 051	2 207	2 270	2 140	1606	1 818	5 259	1 670	1 743	1 882	1 873	3 602
Russian Federation	**1 206**	**1 355**	**1 508**	**1 660**	**1 790**	**725**	**1 403**	**1 990**	**2 233**	**2 192**	**1 887**	**1 378**	**1 304**
Turkey	**431**	**879**	**988**	**1 099**	**1 147**	**870**	**1 095**	**1 189**	**2 233**	**1 126**	**1 170**	**1 359**	**1 486**
Asia-Oceania	**18 071**	**25 833**	**28 192**	**30 715**	**31 256**	**31 760**	**40 930**	**40 576**	**43 696**	**45 779**	**47 405**	**47 879**	**51 521**
China	2 069	5 708	7 189	8 882	9 345	13 791	18 265	18 419	19 272	22 117	23 732	24 567	28 119
Republic of Korea	3 115	3 699	3 840	4 086	3 807	3 513	4 272	4 657	4 562	4 521	4 525	4 556	4 229
India	801	1 639	2 020	2 254	2 315	2 642	3 557	3 927	4 175	3 898	3 845	4 161	4 489
Iran	278	817	905	997	1 051	1 394	1 599	1 649	1 000	744	1 091	982	1 165
Japan	10 141	10 800	11 484	11 596	11 564	7 934	9 629	8 399	9 943	9 630	9 775	9 278	9 205
Thailand	412	1 123	1 194	1 287	1 394	999	1 645	1 458	2 429	2 457	1 881	1 909	1 944
Other Asian countries	1 255	2 047	1 560	1 611	1 781	1 487	1 964	2 067	2 316	2 411	2 557	2 425	2 371
Africa	**329**	**522**	**567**	**545**	**583**	**413**	**515**	**557**	**586**	**626**	**720**	**835**	**902**
Global total	**58 374**	**66 482**	**69 258**	**73 372**	**70 552**	**61 843**	**77 661**	**79 956**	**85 474**	**87 398**	**89 837**	**90 844**	**94 977**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).
[a] North American Free Trade Association.

Table II.A1.2
Vehicle sales, selected countries and regions, 2005-2016
(Thousands of units)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
NAFTA[a]	**20 243**	**19 899**	**19 301**	**16 240**	**12 859**	**14 204**	**15 598**	**17 527**	**18 765**	**19 910**	**21 175**	**21 497**
United States	17 444	17 049	16 460	13 493	10 601	11 772	13 041	14 786	15 883	16 843	17 846	17 866
Canada	1 630	1 666	1 690	1 674	1 482	1 583	1 620	1 716	1 781	1 890	1 940	1 984
Mexico	1 169	1 184	1 151	1 074	776	848	937	1 025	1 101	1 176	1 389	1 648
South America	**3 096**	**3 458**	**4 308**	**4 662**	**4 638**	**5 516**	**5 980**	**6 144**	**6 265**	**5 565**	**4 514**	**4 052**
Argentina	403	460	565	612	487	698	883	830	964	614	644	709
Brazil	1 715	1 928	2 463	2 820	3 141	3 515	3 633	3 802	3 767	3 498	2 569	2 050
Chile	200	200	230	253	181	303	356	362	398	354	298	320
Colombia	150	205	235	210	195	285	295	285	287	314	272	247
Ecuador	93	90	92	113	93	132	140	121	114	120	81	64
Peru	23	33	51	93	77	121	150	191	201	187	173	170
Uruguay	15	15	19	25	38	55	55	56	61	57	51	47
Venezuela (Bolivarian Republic of)	175	209	319	200	137	125	121	131	99	24	15	3
European Union (EU) (28 countries)	**18 186**	**18 516**	**18 870**	**17 386**	**16 227**	**15 665**	**15 664**	**14 358**	**14 136**	**14 995**	**16 454**	**17 568**
Czechia	176	184	207	215	187	187	195	194	186	216	260	291
France	2 598	2 544	2 629	2 615	2 719	2 709	2 687	2 332	2 207	2 211	2 345	2 478
Germany	3 615	3 772	3 482	3 425	4 049	3 198	3 508	3 394	3 258	3 357	3 540	3 709
Italy	2 495	2 606	2 777	2 422	2 357	2 164	1 943	1 546	1 421	1 493	1 726	2 050
Poland	255	280	355	398	322	367	339	330	353	392	432	505
Slovakia	75	84	89	102	93	74	78	78	75	82	90	101
Spain	1 959	1 953	1 939	1 363	1 074	1 114	931	791	823	1 030	1 277	1 347
United Kingdom	2 828	2 734	2 800	2 485	2 223	2 294	2 249	2 334	2 596	2 843	3 061	3 124
Other European Union countries	4184	4358	4591	4360	3203	3559	3733	3360	3217	3372	3722	3964
Russian Federation	**1 807**	**2 245**	**2 898**	**3 222**	**1 597**	**2 107**	**2 902**	**3 142**	**2 999**	**2 592**	**1 441**	**1 404**
Turkey	**715**	**618**	**595**	**494**	**557**	**761**	**864**	**818**	**893**	**807**	**1 011**	**1 008**
Asia-Oceania	**20 409**	**21 819**	**23 626**	**24 284**	**28 268**	**35 192**	**35 405**	**38 226**	**40 579**	**42 557**	**43 411**	**46 858**
China	5 758	7 216	8 792	9 381	13 645	18 062	18 505	19 306	21 984	23 499	24 662	28 028
Republic of Korea	1 145	1 177	1 279	1 246	1 462	1 511	1 586	1 532	1 544	1 662	1 834	1 823
India	1 440	1 751	1 994	1 983	2 266	3 040	3 288	3 596	3 241	3 177	3 425	3 669
Iran	858	971	1 038	1 190	1 320	1 643	1 688	1 044	805	1 288	1 222	1 449
Japan	5 852	5 740	5 309	5 082	4 609	4 956	4 210	5 370	5 376	5 563	5 047	4 970
Thailand	693	675	631	615	549	800	794	1 424	1 331	882	800	769
Other Asian countries	4 663	4 289	4 583	4 787	4 417	5 179	5 334	5 954	6 299	6 487	6 423	6 150
Africa	**1 113**	**1 314**	**1 322**	**1 256**	**1 159**	**1 251**	**1 447**	**1 569**	**1 654**	**1 718**	**1 550**	**1 314**
Global total	**65 924**	**68 353**	**71 563**	**68 315**	**65 569**	**74 972**	**78 170**	**82 129**	**85 606**	**88 338**	**89 685**	**93 856**

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).
[a] North American Free Trade Agreement.

Table II.A1.3
Twenty largest vehicle manufacturers: production, sales, market value and employment, 2010-2015

Ranking	Firm	Home country	Year established	Production (thousands of units)		Sales (billions of dollars)		Market value (billions of dollars)		Employment (thousands of employees)	
				2010	2015	2010	2015	2010	2015	2010	2015
1	Toyota Motor	Japan	1937	8 557	10 084	211	236	127	177	321	349
2	Volkswagen Group	Germany	1937	7 341	9 872	168	246	82	73	352	610
3	Hyundai Motor	Republic of Korea	1967	5 765	7 988	64	125	22	46	...	180
4	General Motors	United States	1908	8 476	7 486	134	152	-	50	202	215
5	Ford Motor	United States	1903	4 988	6 396	118	150	42	54	164	199
6	Nissan Motor	Japan	1933	3 982	5 170	87	102	36	43	169	152
7	Fiat Chrysler Automobiles (FCA)	Italy	2014	-	4 865	-	123	-	10	-	238
	Fiat	Italy	1900	2 410	-	72	-	13	-	197	-
	Chrysler	United States	1925	1 578	-	-	-	-	-	-	-
8	Honda Motor	Japan	1948	3 643	4 544	103	118	63	51	177	208
9	Suzuki Motor	Japan	1920	2 893	3 034	31	27	12	14	52	62
10	Renault	France	1898	2 716	3 033	47	50	11	29	125	120
11	PSA Peugeot-Citroën	France	1896	3 606	2 982	69	61	6	12	198	187
12	BMW (*Bayerische Motoren Werke*)	Germany	1916	1 481	2 280	74	102	27	60	94	122
13	SAIC Motors	China	1995	347	2 261	15	102	21	34	4	93
14	Daimler AG	Germany	1886	1 940	2 135	110	166	45	75	258	284
15	Mazda Motor	Japan	1920	1 308	1 541	26	28	5	10	39	46
16	Changan Motors	China	1957	1 103	1 540	...	...	...	...	...	...
17	Mitsubishi Motors	Japan	1970	1 174	1 219	20	19	8	4	31	30
18	Dongfeng Motors	China	1969	650	1 209	10	20	13	10	96	192
19	BAIC Motor	China	1958	616	1 170	0	13	0	5	...	126
20	Tata Motors	India	1945	1 011	1 009	14	41	8	20	...	77

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA); Forbes, "The Global 2000: the world's biggest public companies" [online] https://www.forbes.com/global2000/ [date of reference: 25 May 2016]; and Fortune, "Global 500" [online] http://beta.fortune.com/global500/ [date of reference: 21 July 2016].

Table II.A1.4
Twenty largest suppliers to the automobile industry: sales, market value and employment, 2010-2015

Ranking	Firm	Home country	Year established	Sales (billions of dollars)		Market value (billions of dollars)		Employment (number of employees)	
				2010	2015	2010	2015	2010	2015
1	Robert Bosch GmbH	Germany	1886	34 565	44 825	...	...	...	374 778
2	Denso Corp.	Japan	1949	32 850	36 030	...	37 783	...	146 714
3	Magna International Inc.	Canada	1957	23 600	32 134	...	16 643	...	128 975
4	Continental AG	Germany	1881	24 819	31 480	...	49 149	...	207 899
5	ZF Friedrichshafen AG	Germany	1915	15 748	29 518	...	...	...	138 269
6	Hyundai Mobis	Republic of Korea	1977	14 433	26 262	...	21 300	...	47 000
7	Aisin Seiki Co.	Italy	1949	24 613	25 904	...	11 999	...	94 748
8	Faurecia	France	1997	18 220	22 967	...	...	...	99 281
9	Johnson Control Inc.	United States	1885	16 600	20 071	...	25 599	...	139 000
10	Lear Corp.	United States	1917	11 955	18 211	...	9 146	...	136 200
11	Valeo SA	France	1923	7 952	16 088	...	12 202	...	82 800
12	Delphi Automotive	United States	2011	13 817	15 165	...	23 851	...	173 000
13	Yazaki Corp.	Japan	1941	12 531	14 104	...	...	...	279 800
14	Sumitomo Electric Industries	Japan	1911	11 228	13 510	...	11 116	...	240 798
15	JTEKT Corp.	Japan	1935	8 285	11 670	...	5 513	...	43 912
16	Thyssenkrupp AG	Germany	1999	...	11 395	...	...	...	156 487
17	Mahle GmbH	Germany	1920	6 628	11 339	...	...	...	66 000
18	Yanfeng Automotive Trim Systems Co.	China	1944	...	11 242	...		...	...
19	BASF SE	Germany	1865	10 400	10 613	...		...	...

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Automotive News, "Top suppliers" [online] https://www.autonews.com/assets/PDF/CA105764617.PDF, 20 June 2016; *Automotive News*, "Top 100 global suppliers" [online] https://www.autonews.com/assets/PDF/CA74326610.PDF, 13 June 2011; Forbes, "The Global 2000: the world's biggest public companies" [online] https://www.forbes.com/global2000/ [date of reference: 25 May 2016]; and Fortune, "Global 500" [online] http://beta.fortune.com/global500/ [date of reference: 21 July 2016].

Table II.A1.5
Exports of automobile products, by geographical origin, 2000-2016
(Billions of dollars)

	2000	2005	2010	2015	2016
European Union (UE)	**279**	**489**	**542**	**650**	**637**
Belgium	25	40	35	40	44
Czechia	5	13	24	33	36
France	39	63	51	47	49
Germany	92	172	201	243	244
Italy	18	28	30	36	38
Spain	28	43	45	53	57
United Kingdom	26	38	39	52	54
Other European Union countries	46	92	116	145	116
North America	**159**	**188**	**205**	**288**	**289**
United States	67	86	100	130	128
Mexico	31	35	56	97	96
Canada	61	67	50	62	66
Japan	**88**	**123**	**150**	**137**	**145**
Republic of Korea	**15**	**38**	**54**	**71**	**65**
China	**2**	**10**	**28**	**49**	**48**
Turkey	2	9	14	17	19
India	1	3	8	11	13
Brazil	5	12	13	10	11
Rest of the world	19	43	72	90	50
Total	568	915	1 086	1 324	1 278

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

Table II.A1.6
Imports of automobile products, by geographical destination, 2000-2016
(Billions of dollars)

	2000	2005	2010	2015	2016
European Union	**246**	**425**	**433**	**499**	**492**
Belgium	23	35	41	43	47
Czechia	3	7	11	16	18
Germany	42	76	84	104	111
France	30	51	55	53	58
Italy	25	43	40	36	42
Spain	26	46	32	41	43
United Kingdom	39	64	60	78	75
Other European Union countries	58	104	111	129	97
North America	**236**	**288**	**279**	**406**	**409**
United States	170	205	190	293	295
Mexico	20	25	29	45	44
Canada	46	58	60	68	70
Japan	**10**	**13**	**14**	**19**	**21**
Republic of Korea	**2**	**4**	**8**	**15**	**15**
China	**4**	**14**	**53**	**73**	**75**
Turkey	6	12	15	20	20
India	0	1	4	5	5
Brazil	4	5	18	14	11
Rest of the world	68	142	246	254	170
Total	576	904	1 069	1 306	1 220

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

Table II.A1.7
Vehicle manufacturers: main mergers and acquisitions, 2000-2017
(Billions of dollars and percentages)

Date	Buying company	Country	Company acquired	Country	Percentage acquired	Amount
10/07/2009	Vehicles Acq. Holding LLC	United States	General Motors	United States	100	46 800
18/09/1998	Daimler-Benz AG	Germany	Chrysler Corp.	United States	100	40 466
06/06/2014	Volkswagen AG	Germany	Scania AB	Sweden	37	9 152
01/08/2012	Volkswagen AG	Germany	Porsche AG	Germany	50	8 730
29/06/2011	Volkswagen AG	Germany	MAN SE	Germany	25	7 418
03/08/2007	Cerberus Capital Management LP	United States	Chrysler Holding LLC	United States	80	7 400
07/12/2009	Volkswagen AG	Germany	Porsche AG	Germany	50	5 568
22/07/2008	Volkswagen AG	Germany	Scania AB	Sweden		4 370
21/01/2014	Fiat S.p.A.	Italy	FCA US LLC (Chrysler Group)	United States	41	4 350
22/03/2013	Volkswagen AG	Germany	MAN SE	Germany	30	3 694
27/07/2016	Toyota Motor	Japan	Daihatsu Motor	Japan	49	3 098
30/06/2000	Ford Motor Co.	United States	Jaguar Land Rover	United Kingdom	100	2 913
15/01/2010	Volkswagen AG	Germany	Suzuki Motor Corp.	Japan	20	2 532
26/08/2010	Guangzhou Automobile Group Co. Ltd.	China	Denway Motors Ltd.	China	100	2 387
12/12/2012	Renault-Nissan	France, Japan	Avtovaz PJSC	Russian Federation	42	2 318
06/03/2017	PSA Peugeot-Citröen	France	Opel-Vauxhall (subsidiaries of GM)	United States, Germany, United Kingdom	100	2 330
02/06/2008	Tata Motors Ltd.	India	Jaguar Land Rover (subsidiary of Ford)	United States	100	2 300
30/06/2014	Renault-Nissan	France, Japan	Avtovaz PJSC	Russian Federation	33	2 185
20/10/2016	Nissan Motor Co. Ltd.	Japan	Mitsubishi Motors Corp.	Japan	34	2 179
23/03/2007	Volvo AB	Sweden	Nissan Diesel Motor	Japan	76	2 037
10/06/2009	New CarCo Acquisition LLC	Italy, Canada, Estados Unidos	FCA US LLC	United States	100	2 000
18/10/2000	Daimler AG	Germany	Mitsubishi Motors Corp.	Japan	34	1 895
02/08/2010	Zhejiang Geely Holding Group Co. Ltd.	China	Volvo Personvagnar AB	Sweden	100	1 800
01/03/2002	Renault SA	France	Nissan Motor Co Ltd.	Japan	12	1 769
28/03/2002	Nissan Motor Co. Ltd.	Japan	Renault SA	France	16	1 727
02/01/2001	Volvo AB	Sweden	Renault Véhicles Industriels	France	100	1 723
17/03/2009	MAN SE	Germany	Volkswagen truck and bus manufacturing unit in Brazil	Germany, Brazil	100	1 612
27/03/2000	Volkswagen AG	Germany	Scania AB	Sweden	19	1 597
28/03/2007	Porsche Automobil Holding SE	Germany	Volkswagen AG	Germany	3	1 390
03/06/2011	Fiat S.p.A.	Italy	FCA US LLC	United States	16	1 268
17/10/2002	General Motors	United States	Daewoo Motors	Republic of Korea	100	1 170
29/09/2006	Fiat S.p.A.	Italy	Ferrari S.p.A. Esercizio Fabbriche Automobili e Corse	Italy	29	1 133
19/07/2012	Volkswagen AG (Automobili Lamborghini S.p.A.)	Germany	Ducati Motor Holding	Italy	100	1 046
09/04/2008	Renault SA	France	Avtovaz PJSC	Russian Federation	25	1 000
05/01/2015	Volvo AB	Sweden	Dongfeng Commercial Vehicles Co.	China	45	902
19/11/2013	Daimler AG	Germany	BAIC Motor	China	12	873
18/06/2014	Nissan-Renault	Japan, France	OAO Avtovaz	Russian Federation	75	750
29/04/2014	Dongfeng Motor Corp.	China	PSA Peugeot-Citröen	France	14	720

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

Table II.A1.8
Suppliers to the automobile industry: main mergers and acquisitions, 2000-2017
(Billions of dollars and percentages)

Date	Buying company	Country	Company acquired	Country	Percentage acquired	Amount
27/10/2016	Qualcomm	United States	NXP Semiconductors	Netherlands	100	47 000
25/01/2016	Johnson Controls Inc.	United States	Johnson Controls International plc (JCI) (Adient)	United States	100	28 667
25/07/2007	Continental AG	Germany	Siemens VDO Automotive AG	Germany	100	15 634
13/03/2017	Intel Corp.	United States	Mobileye NV	Israel	100	14 132
15/05/2015	ZF Friedrichshafen AG	Germany	TRW Automotive Holdings Corp.	United States	100	12 857
08/01/2009	Schaeffler GmbH & Co. KG	Germany	Continental AG	Germany	100	8 132
14/11/2016	Samsung	Republic of Korea	Harman International Industries	United States	100	8 000
06/11/2015	China National Chemical Corp. (ChemChina)	China	Pirelli & C. S.p.A.	Italy	...	7 104
07/08/2007	Carlyle Group LP y Onex Corp.[a]	United States, Canada	Allison Transmission Holdings Inc. (subsidiary of GM)	United States	100	5 575
22/11/2016	Tesla Inc.	United States	SolarCity Corp.	United States	100	5 319
03/03/2003	Blackstone Group LP[a]	United States	TRW Automotive Holdings Corp.	United States	100	4 725
03/11/2016	American Axle & Manufacturing Holdings Inc.	United States	Metaldyne Performance Group Inc.	United States	100	3 230
22/11/2016	KKR & Co LP[a]	United States	Calsonic Kansei Corp.	Japan	100	3 112
03/08/2015	BMW, Daimler AG y Audi	Germany	Nokia maps and navigation service	Finland	100	3 100
12/12/2005	Johnson Controls Inc.	United States	York International Corp.	United States	100	3 082
03/07/2008	Icahn Enterprises LP[a]	United States	Federal-Mogul Holdings LLC	United States	100	2 953
13/06/2016	Beijing Jianguang Asset Management Co. (JAC)[a]	China	NXP Semiconductors NV	Netherlands	100	2 750
01/04/2016	Magna International Inc.	Canada	Getrag GmbH	Germany	100	2 665
30/06/2014	Bain Capital LLC[a]	United States	TI Automotive Ltd.	United Kingdom	100	2 344
02/01/2014	Advance Auto Parts Inc.	United States	General Parts International Inc.	United States	100	2 040
27/12/2005	JTEKT Corp.	Japan	Toyoda Machine Works Ltd.	Japan	100	1 952
30/01/2015	Continental AG	Germany	Veyance Technologies Inc.	United States	100	1 910
31/03/2006	EQT Partners AB[a]	Sweden	MTU Friedrichshafen GmbH	Germany	100	1 894
21/12/2015	Delphi Automotive PLC	United States	HellermannTyton Group PLC	United Kingdom	100	1 785
18/07/2003	Robert Bosch GmbH	Germany	Buderus AG	Germany	...	1 629
16/06/2014	Johnson Controls Inc.	United States	Air Distribution Technologies Inc.	United States	100	1 600
01/08/2007	Carlyle Group LP[a]	United States	Goodyear Engineered Products International Inc.	United States		1 475
17/08/2005	PAI Partners[a]	France	Kwik-Fit Group Ltd.	United Kingdom	100	1 458
01/02/2012	Iochpe Maxion S.A.	Brazil	Hayes Lemmerz International	United States	100	1 317
19/12/2013	Huayu Automotive Systems Co. Ltd.	China	Yanfeng Visteon Automotive Trim Systems Co. Ltd.	China, United States	50	1 251
26/10/2012	Delphi Automotive PLC	United States	Motor vehicle division of FCI Group	United Kingdom	...	1 199
11/11/2015	BorgWarner Inc.	United States	Old Remco Holdings LLC	United States	100	1 196
01/07/2016	Yokohama Rubber Co. Ltd.	Japan	Alliance Tire Group BV	United States, India	100	1 179
04/12/2012	Robert Bosch GmbH	Germany	SPX Service Solutions	United States	100	1 150
21/03/2016	LKQ Corp.	United States	Rhiag-Inter Auto Parts S.p.A.	Italy	100	1 141
25/11/2008	BHF Kleinwort Benson Group	Belgium	Asahi TEC Corp.	Japan	100	1 140
31/08/2016	Ningbo Yinyi Group Co. Ltd.	China	Punch Powertrain SA	Belgium	100	1 119
11/01/2007	Asahi TEC Corp.	Japan	Metaldyne Corp.	United States	100	1 113
04/07/2011	ITOCHU Corp.	Japan	Kwik-Fit Group Ltd.	United Kingdom	100	1 036

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from Bloomberg.
[a] Investment fund.

Table II.A1.9
Largest vehicle manufacturers: main subsidiaries and brands and type of vehicles produced, 2017

Parent company	Subsidiaries/brands	Segment	Year established	Home country	Share (percentages)
General Motors	Chevrolet	3 4 5 7 8 9 10 12	1911	United States	100
	GMC	10	1911	United States	100
	Cadillac	4 5 6 9	1902	United States	100
	Buick	2 3 4 5 9	1903	United States	100
	Holden	5	1986	Australia	100
Ford Motor Co.	Ford Motor	2 3 4 5 7 8 9 10 12	1903	United States	100
	Lincoln	6	1917	United States	100
Volkswagen AG Group	Volkswagen	1 2 3 4 5 6 7 8 9 10 12	1937	Germany	100
	Audi	2 3 4 5 6 7 9 12	1932	Germany	
	Porsche AG	6 7 9	1931	Germany	100
	Lamborghini	7	1948	Italy	100
	Bugatti Automobiles S.A.S.	7	1909	Italy	100
	MAN SE (Maschinenfabrik Augsburg-Nürnberg SE)	11	1758	Germany	71
	Navistar	11	1902	United States	17
	Bentley Motors	6 7	1919	United Kingdom	100
	Scania AB	11	1911	Sweden	91
	SEAT, S.A.	2 3 8 9	1950	Spain	100
	Škoda Auto	2 3 5 9	1895	Czechia	100
	Ducati Motor Holding S.p.A.	13	1926	Italy	100
Daimler AG	Mercedes-Benz	3 4 5 6 7 8 9 12	1926	Germany	100
	Smart GmbH	1 12	1994	Germany	100
	EQ	12	2016	Germany	100
BMW Group	BMW	3 4 5 6 7 8 9 12	1916	Germany	100
	Mini	2	1959	United Kingdom	100
	Rolls Royce Motor Cars	6	1906	United Kingdom	100
Fiat Chrysler Automobiles (FCA)	Fiat	1 2 3 7 8 10 12	1899	Italy	100
	Alfa Romeo Automobiles S.p.A.	2 3 4 7 9	1910	Italy	100
	Ferrari S.p.A.	7	1947	Italy	90
	Lancia Automobiles S.p.A.	2 5 8	1906	Italy	100
	Maseratti S.p.A.	5 6 7 9	1914	Italy	100
	Chrysler	4 5 8	1925	United States	100
	Dodge	4 10	1914	United States	100
	Jeep	9	1941	United States	100
	Ram Trucks	10	2009	United States	100
PSA Peugeot Citroën	Citroën SA	1 2 3 4 8 9	1919	France	100
	Peugeot	1 2 3 4 8 9	1810	France	100
	DS Automobiles	3 4	2009	France	100
	Opel	1 2 3 4 8	1862	Germany	100
	Vauxhall	2 3 4 5	1857	United Kingdom	100
Renault	Renault	1 2 3 8 9 10	1899	France	100
	Nissan	2 3 7 8 9 10 12	1933	Japan	44
	Renault Samsung Motors Co., Ltd.	2 3 4 9	1994	Republic of Korea	80
	Automobile Dacia S.A.	2 3 8 9	1966	Romania	100
	AvtoVAZ	2 3 4 9	1966	Russian Federation	67
Toyota Group	Toyota Motor	1 2 3 4 5 7 8 9 10 12	1937	Japan	100
	Daihatsu Motor Co., Ltd.	9	1907	Japan	100
	Lexus	3 4 5 6 7 9 12	1989	Japan	100
Nissan	Nissan	2 3 7 8 9 10 12	1933	Japan	100
	Datsun	2 3	1933	Japan	100
	Infiniti	3 4 5 9	1989	Japan	100
	Renault SA	1 2 3 8 9 10	1899	France	15
	Mitsubishi Motors	1 2 3 9 10 12	1970	Japan	34
Honda Motor	Honda	2 3 7 8 9 12	1948	Japan	100
	Acura	4 5	1986	Japan	100
Hyundai Motor Company	Hyundai Motor	1 2 3 4 5 6 7 8 9 12	1967	Republic of Korea	100
	KIA Motors	1 2 3 4 8 9 12	1944	Republic of Korea	100
Geely Automobile	Geely	1 2 3 12	1986	China	100
	Volvo Cars	3 4 5 7 9	1927	Sweden	100
	The London Taxi Company	5	1899	United Kingdom	100
Tata Motors	Tata Motors	3	1945	India	100
	Jaguar Cars	4 5 6 7 9	1922	United Kingdom	100
	Land Rover	9	1947	United Kingdom	100
	Tata Daewoo Commercial Vehicles	11	2002	Republic of Korea	100

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

Note: 1 city cars; 2 small cars; 3 medium-sized cars; 4 large cars; 5 executive cars; 6 luxury cars; 7 sports cars; 8 multipurpose vehicles; 9 light commercial vehicles, such as crossover utility vehicles (CUVs) and sport utility vehicles (SUVs); 10 Pick-up trucks; 11 heavy commercial vehicles (trucks, buses); 12 hybrid and electric vehicles; 13 motorcycles.

CHAPTER III

The automotive industry in Mexico: a success story under pressure

Introduction: building a success story

In its long history, the Mexican motor vehicle industry has gone through periods of both boom and rapid growth and of deep crises that forced a reassessment of the goals and strategies of public policy and private investment. Merely a decade after its solid performance in the 1960s, the sector was seen to portray everything that was wrong with Mexico's development. In particular, it was considered one of the main culprits of the manufacturing sector's trade deficit and an example of a truncated form of industrialization, characterized by the assembly of end products with no carry-over to intermediate inputs or capital goods, the true bearers of technological progress. In some cases the industry was deemed an example of Latin America's "showcase modernization" (Fajnzylber, 1983). At the heart of the problem was a proliferation of different models which led to a fragmented production structure that prevented the industry from achieving a scale that could lead to reasonable levels of profitability without protectionist measures.

During the crisis of the 1980s and as a result of the redefinition of the automotive strategy —reducing and later eliminating quantitative goals for domestic content— the industry began a process of expansion that was later boosted by the North American Free Trade Agreement (NAFTA). Scepticism surrounding the industry had been based on its low inclusion of national components and on the fact that it was considered simply as a maquila operation. However, since the international financial crisis of 2008, the Mexican motor vehicle industry has experienced a rapid transformation: from a low-cost platform for mass-market vehicle assembly to an integrated production chain that is more diversified in terms of products and technological sophistication.

Equi volorio mos ma peliqui omnieni tassim re excearum et rero modis expelescimus eaquide et eos si cus dolupitatus de odis.

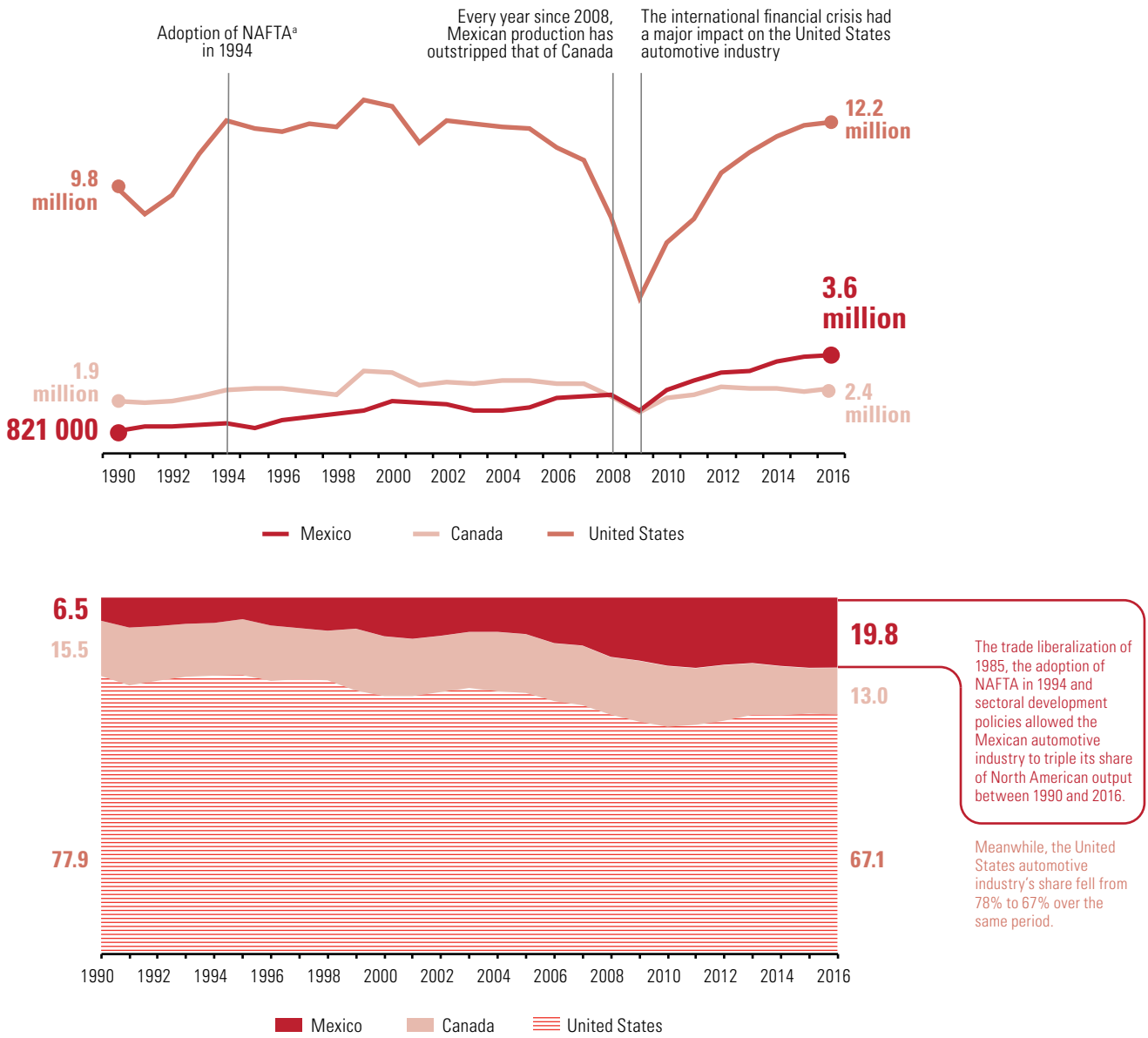
The industry now contributes over 3% of the country's GDP and 18% of its manufacturing output. It runs a yearly trade surplus of US$ 52 billion, accounted for over US$ 51.2 billion in cumulative foreign direct investment (FDI) inflows between 1999 and 2016 (11% of the total) and is a direct employer of 900,000 workers (ProMéxico, 2016). Furthermore, 80% of Mexico's motor vehicle production is exported, mainly (86%) to the other two NAFTA member countries, making it the seventh largest producer and fourth largest exporter in the world.

The purpose of this chapter is to analyse the industry's current situation, highlighting its strengths and weaknesses, especially in the context of two large sets of tensions: the first derived from the technological revolution (covered in chapter II of this publication) and the second from the changes to the political landscape of the United States, especially with regard to NAFTA in a context of post-globalization pressures.

A. The growing importance of Mexico's motor vehicle industry

In the mid 1980s Mexico was a marginal player in North America's automotive industry, producing less than 3% of all vehicles. However, steps towards trade liberalization in 1985, the passage of NAFTA in 1994 and the introduction of sectoral development policies have paved the way for billions of dollars from the world's largest carmakers and suppliers to be channelled to the Mexican motor vehicle industry, which has more than doubled its presence in the region (see figure III.1).

Figure III.1
North America: vehicle production by country, 1990-2016
(Units and percentages)

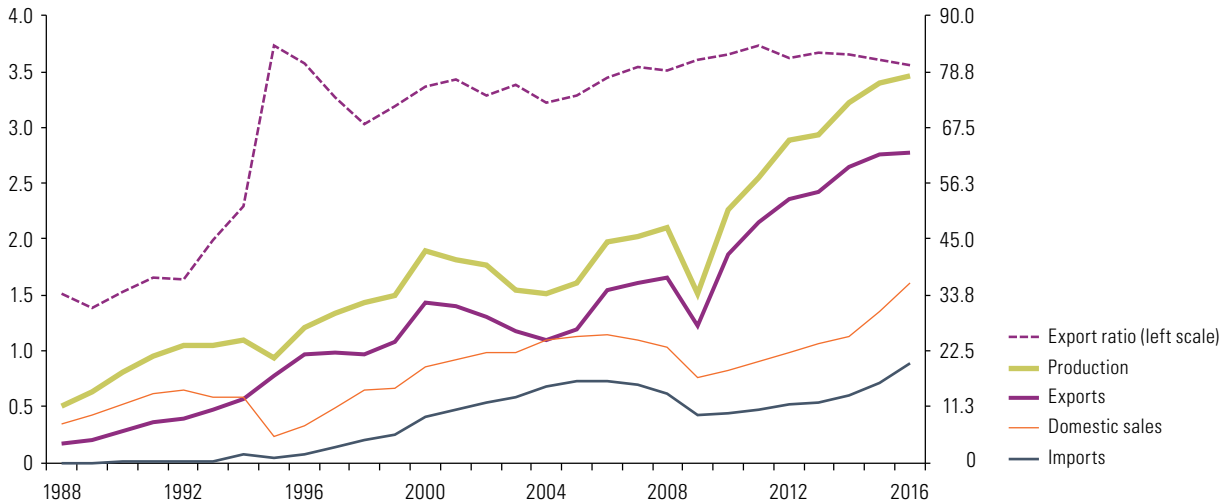


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).
[a] North American Free Trade Agreement.

The Mexican motor vehicle industry has exhibited healthy growth in recent decades, but its marked exporting bias means it remains highly dependent on the economic performance of the United States. Between 1990 and 2016, especially after the adoption of NAFTA, the percentage of vehicles manufactured in Mexico and earmarked for export jumped from 34% to 80% (see figure III.2). Mexico's motor vehicle industry has recorded solid results whenever its northern neighbour's economy has been in ascendancy, while the sector has been negatively affected at times of recession in the United States. The global financial crisis of 2008 was particularly harsh on both the economy of the United States and its automotive industry, which in turn had severe consequences for

Mexico's motor vehicle sector. Mexican production fell by almost 30% between 2008 and 2009 before later recovering —along with its exports and domestic sales— at an annual average rate of 14%, with a peak of close to an historical 3.5 million units in 2016 (see figure III.2). Thus, all three North American countries have recorded seven years of uninterrupted growth in sales and production, with no apparent signs of abating. This in turn has boosted the sustained expansion of installed production capacity in the United States and in Mexico to meet future demand (PwC, 2016).

Figure III.2
Mexico: production, exports, total domestic sales and vehicle imports, 1988-2006
(Export ratio and millions of units)

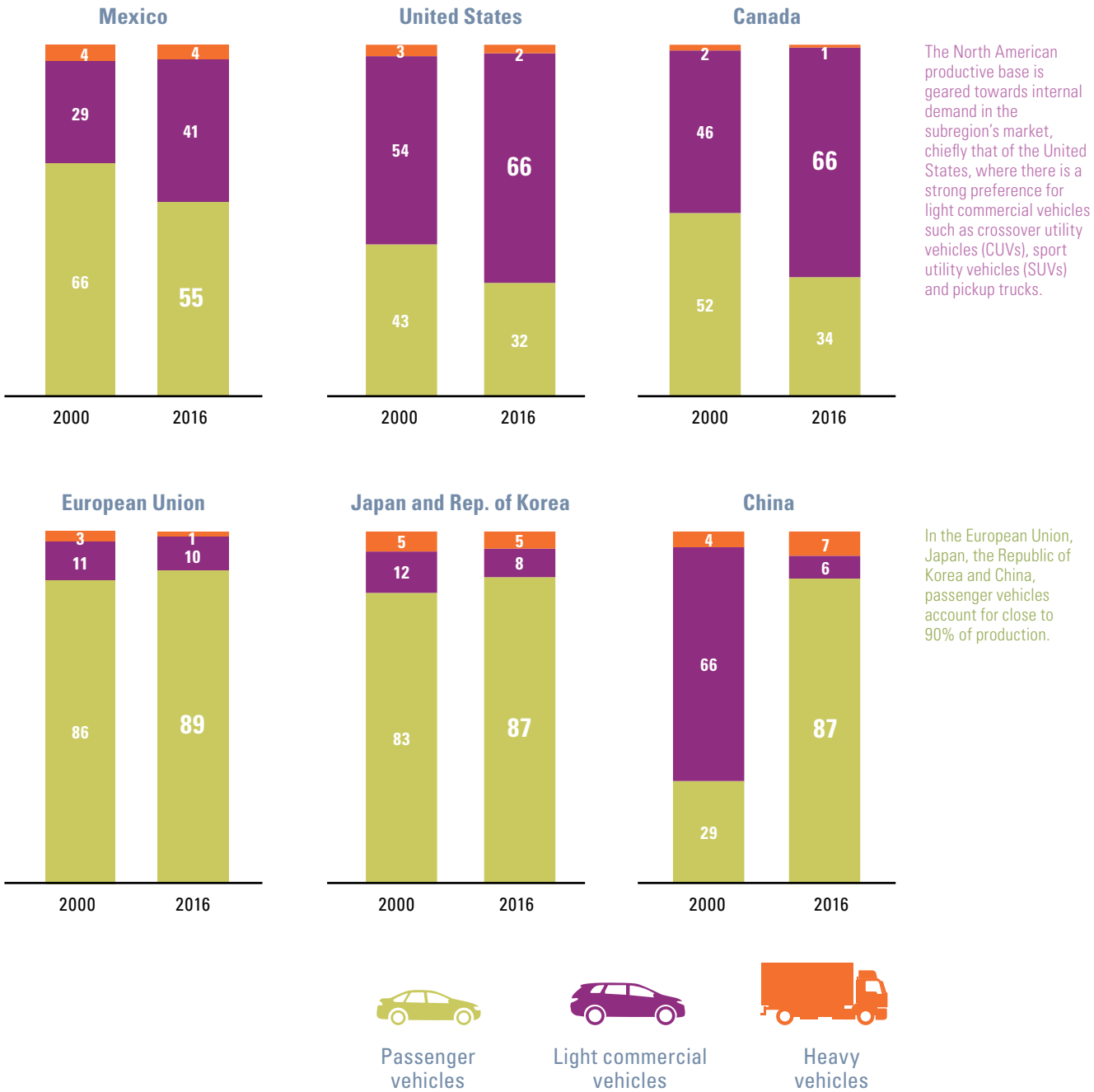


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from Mexican Automotive Industry Association (AMIA).

In 2016, aggregate production by Canada, Mexico and the United States reached 18.2 million vehicles. While the United States and Canada have seen their share of production within the bloc drop in recent years, Mexico's has increased notably; between 2005 and 2016, the United States saw its share of production within NAFTA shrink from 73.2% to 67.1%, while Mexico's increased from 10.3% to 19.8%. In every year since 2008, Mexico's production has been higher than Canada's (see figure III.1). In addition, Mexico has captured 9 of the last 11 new assembly plants announced for the continent since 2011, and it is expected to significantly increase light vehicle production to close to 5 million units by 2020 (CAR, 2016).

North America's production base is geared towards satisfying the subregion's demand, mainly from the United States, with a strong emphasis on light commercial vehicles such as crossover utility vehicles (CUVs), sport utility vehicles (SUVs) and pickup trucks. In 2016, light commercial vehicles accounted for two thirds of production and sales in Canada and the United States, and close to two fifths in Mexico (see figure III.3B). This specialization of production stands in contrast to that of the world's other main manufacturing regions; in North America, light commercial vehicles represent 61% of production, while in the European Union, Japan, the Republic of Korea and China, close to 90% of production is focused on passenger vehicles (see figure III.3A). This consumption pattern has meant that North America accounts for close to 60% of global light commercial vehicle production, a trend that, barring any significant fuel price hikes, can be expected to continue. However, environmental pressures and demands for greater energy efficiency could accelerate technological innovation in the form of new light materials, smaller engine sizes, hybrid solutions and increased use of electro-propulsion technologies.

Figure III.3
Specialization of production by selected regions and countries, by type of vehicle, 2000-2016
(Percentages)



The North American productive base is geared towards internal demand in the subregion's market, chiefly that of the United States, where there is a strong preference for light commercial vehicles such as crossover utility vehicles (CUVs), sport utility vehicles (SUVs) and pickup trucks.

In the European Union, Japan, the Republic of Korea and China, passenger vehicles account for close to 90% of production.

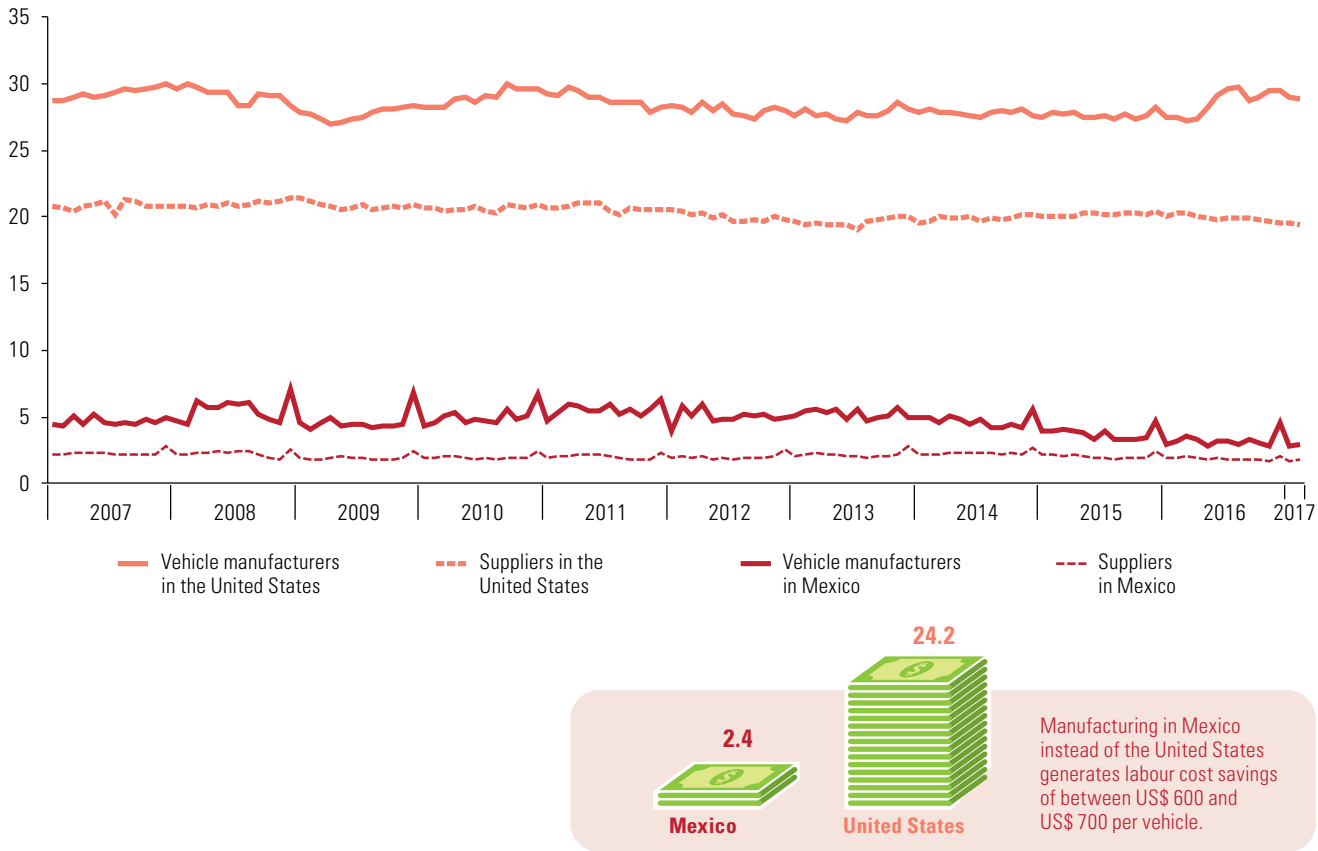
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).

Today, light vehicles represent 96% of Mexican production (55.4% passenger vehicles and 40.7% light commercial vehicles), while heavy vehicles account for 4% of production (trucks and buses). This specialization is a result of consumption patterns in North America, albeit with greater emphasis on passenger vehicles (see figure III.3). Despite the small proportion of heavy vehicles in Mexico's total production, the country's share of this category within NAFTA increased from 16% in 2000 to 33% in 2016.

New requirements for emissions and energy efficiency have increased the costs of both production and research and development (R&D), which has led manufacturers to seek cost savings in other areas. One strategy has been for automobile companies to move operations from their industrialized economies of origin to developing countries, a process that has enhanced Mexico's importance —and that of other emerging economies close to large markets— as a destination for productive investments, focused mainly on vehicle assembly. In addition to geographical proximity, a broad network of free trade agreements, active sectoral policies and a favourable attitude towards foreign investment, labour costs have become a key determinant in the relocation of the auto industry's production facilities.

The current average wage for auto plant workers in Mexico stands at US$ 2.38 per hour, in comparison to approximately US$ 24 per hour earned by workers in the United States (see figure III.4) (Welch and Cattan, 2017). Hence, manufacturing in Mexico instead of the United States generates labour cost savings of between US$ 600 and US$ 700 per vehicle, which represents close to half the cost savings made when producing vehicles in Mexico to be sold in the United States (CAR, 2017a).

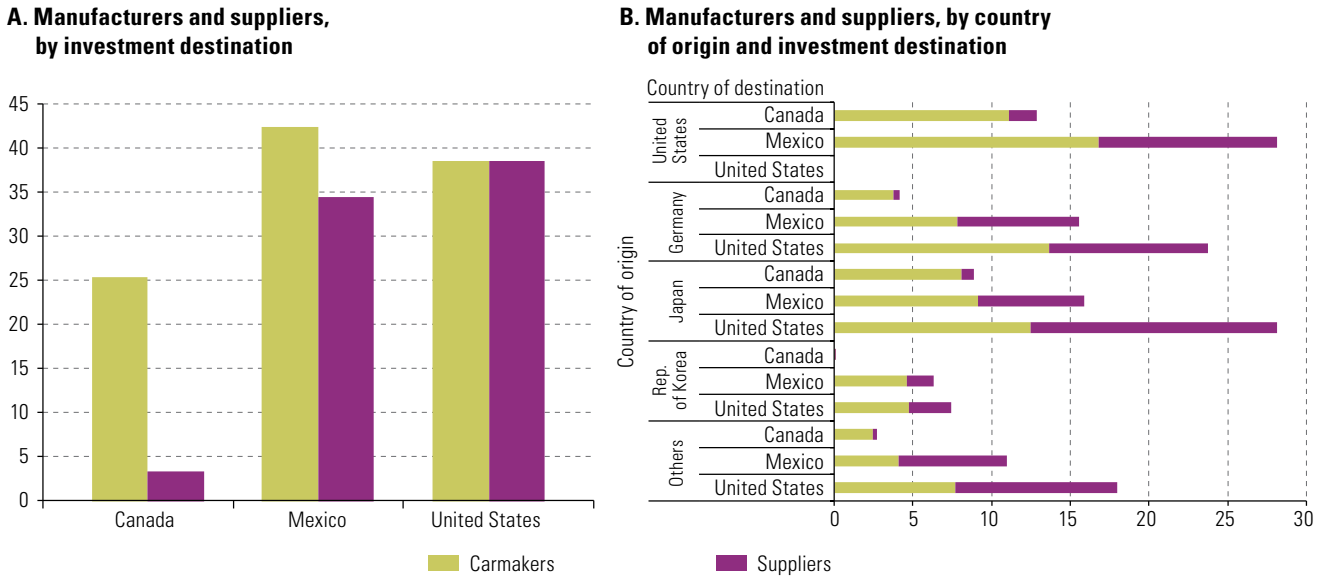
Figure III.4
United States and Mexico: average hourly wage for workers and unsupervised employees in the automotive industry, 2007-2017
(Dollars per hour)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from United States Department of Labor, Bureau of Labor Statistics, and National Institute of Statistics and Geography (INEGI) of Mexico.

Mexico has become the main destination for foreign investment in new North American assembly plants and an increasingly important destination for the deployment of a new network of suppliers in the bloc (see figure III.5A). In recent years, and especially after 2010, a large number of international automakers have closed some of their domestic production lines in order to establish a manufacturing base in Mexico. Companies from the United States invested heavily in Mexico, and while German and Japanese companies prioritized investments in the United States, they have gradually been increasing their presence in Mexico (see figures II.5B and II.6).

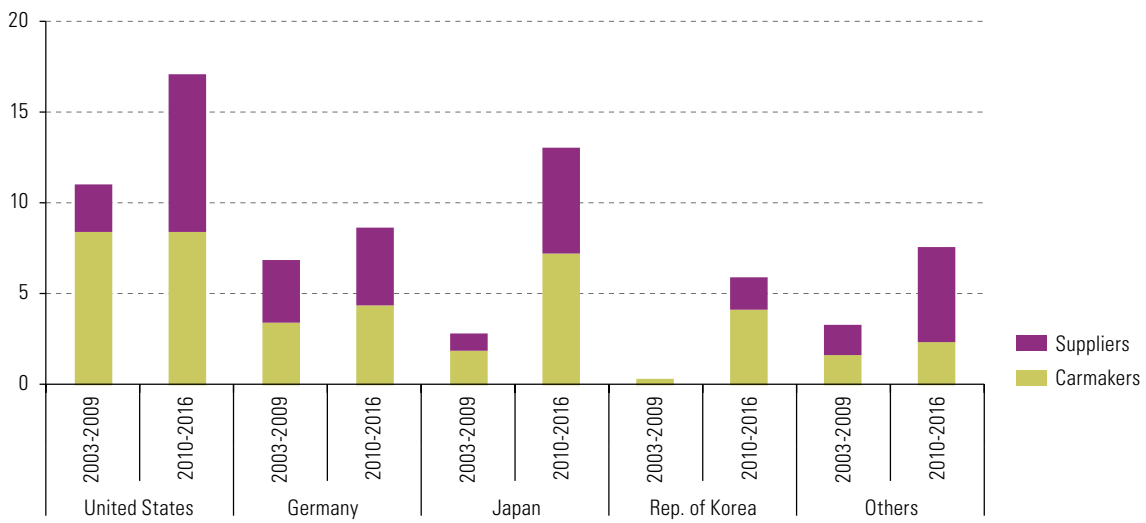
Figure III.5
North America: cross-border investments in the automotive industry, 2003-2016
(Billions of dollars)



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

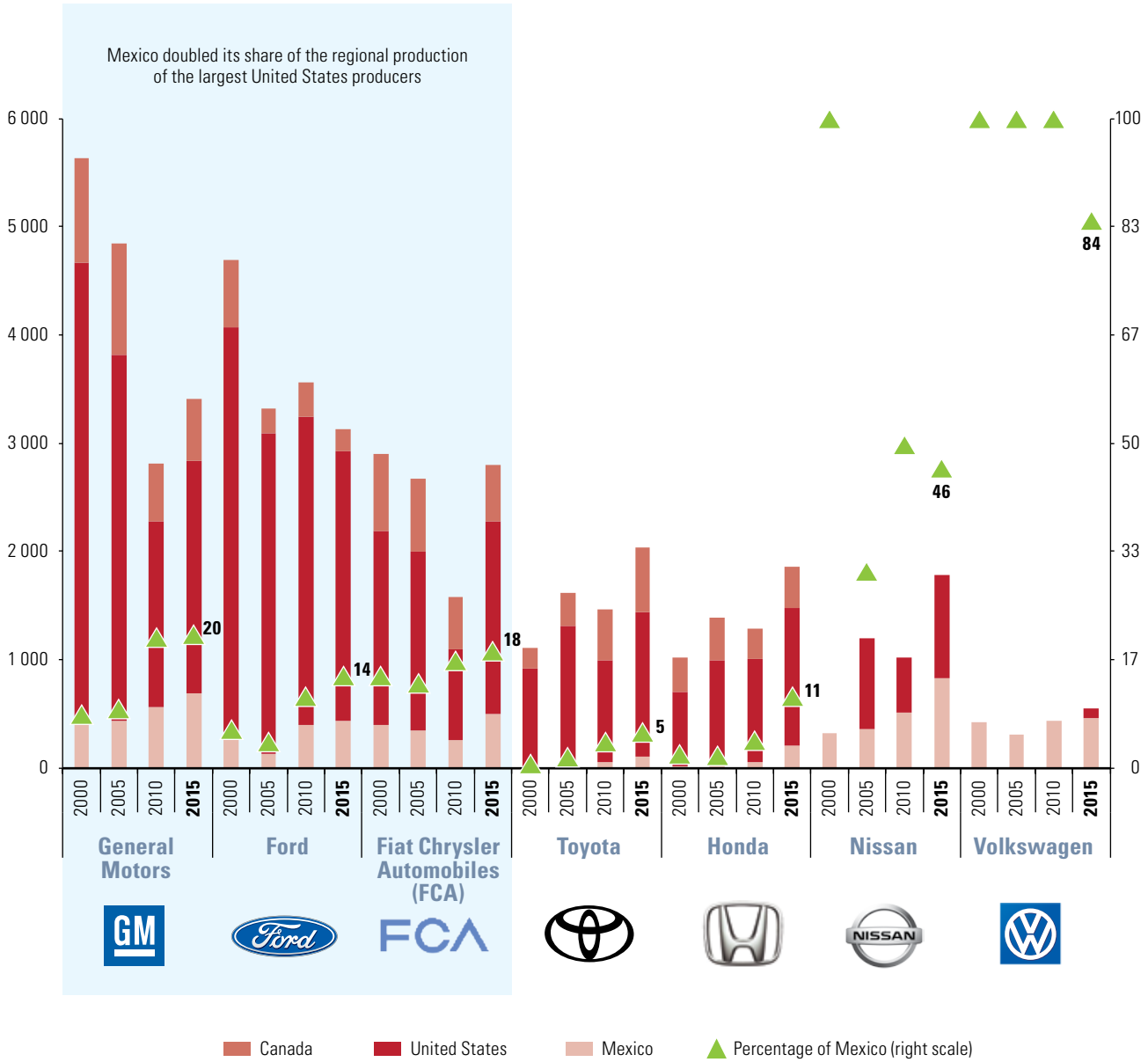
Thus, a sizeable part of United States' smaller share of NAFTA production is attributable to new installed capacity in Mexico, which has replaced the expansion of capacity in the United States (or the transfer of auto manufacturing to more distant countries). That said, the United States has yet to transfer its existing production capacity to Mexico on a mass scale; in 2016, the country still represented 67% of NAFTA production (see figure III.1B), but it has been missing out on incremental growth and on investments from automakers and suppliers that are choosing to locate new facilities in Mexico (see figures III.6 and III.7) (CAR, 2016).

Figure III.6
Mexico: cross-border investments announced by automakers and suppliers, by country of origin, 2003-2016
(Billions of dollars)



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

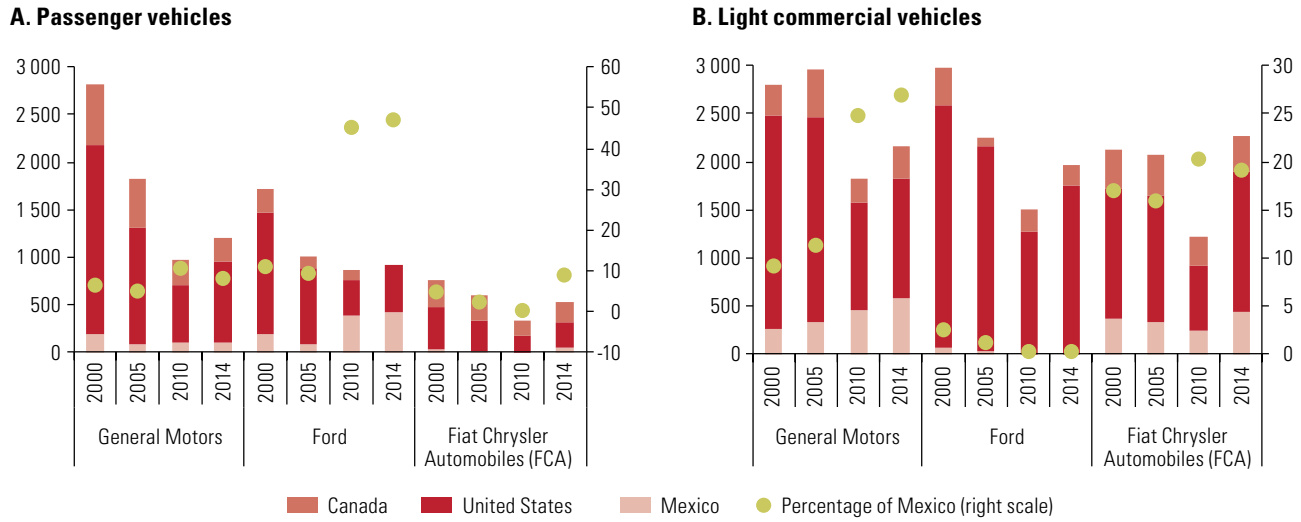
Figure III.7
North America: vehicle production, by company and country of manufacture, 2000-2015
(Thousands of units and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).

This trend should become more pronounced as plants that are currently under construction come on line. For the past 15 years, firms from the United States (General Motors, Ford and Fiat-Chrysler Automobiles (FCA)) have seen their production drop sharply, a trend that has only started changing quite recently. In that context, regional production by major United States automakers in Mexico doubled, although not all firms followed the same strategy (see figure III.7). While General Motors and FCA focused on light commercial vehicles, Ford emphasized passenger vehicles (see figure III.8) (*Detroit Free Press*, 2016). Changes and adjustments to capacity have been ongoing; between 2016 and 2020, production numbers in the United States and Canada are expected to decline by 430,000 and 135,000 units respectively, while output volume in Mexico is set to grow by some 850,000 vehicles, 9% of total NAFTA production (CAR, 2016).

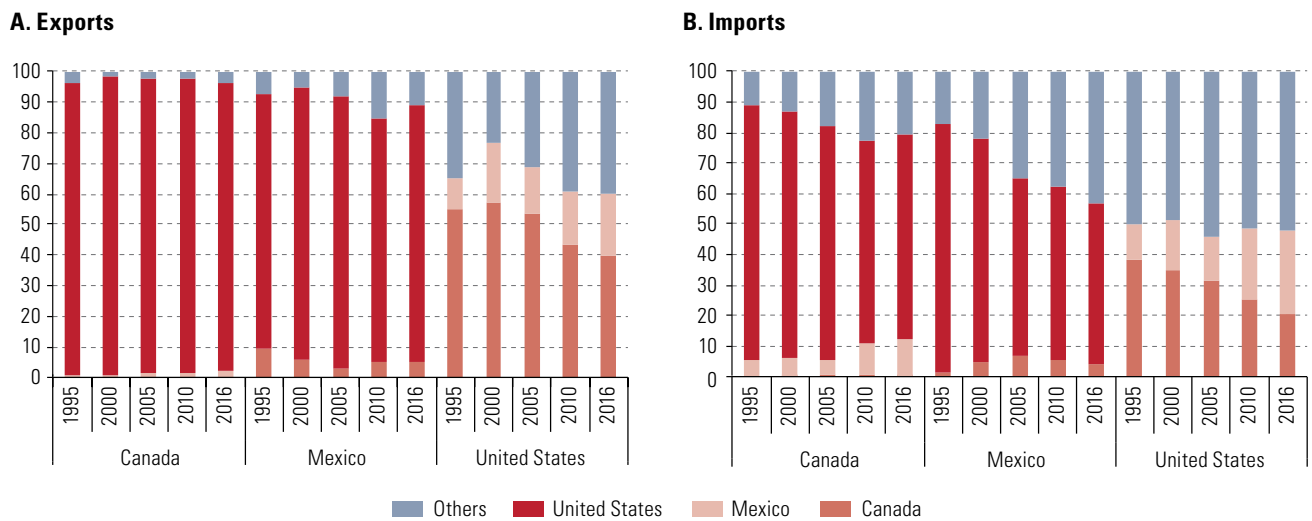
Figure III.8
North America: General Motors, Ford and Fiat-Chrysler vehicle production, by country and type of vehicle, 2000-2014
(Thousands of units and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from International Organization of Motor Vehicle Manufacturers (OICA).

With the exception of Nissan, Japanese companies have been more conservative insofar as moving production to Mexico. In the 1980s Japanese carmakers invested heavily and began manufacturing vehicles in the United States in order to overcome import barriers. However, in similar vein to their United States counterparts, Japanese companies have gradually started to lean towards Mexico when expanding their production capacity to serve the North American market, especially Nissan and Honda (see figure III.7).

Figure III.9
North America: exports and imports of automotive products, by geographical destination, 1995-2016
(Percentages)

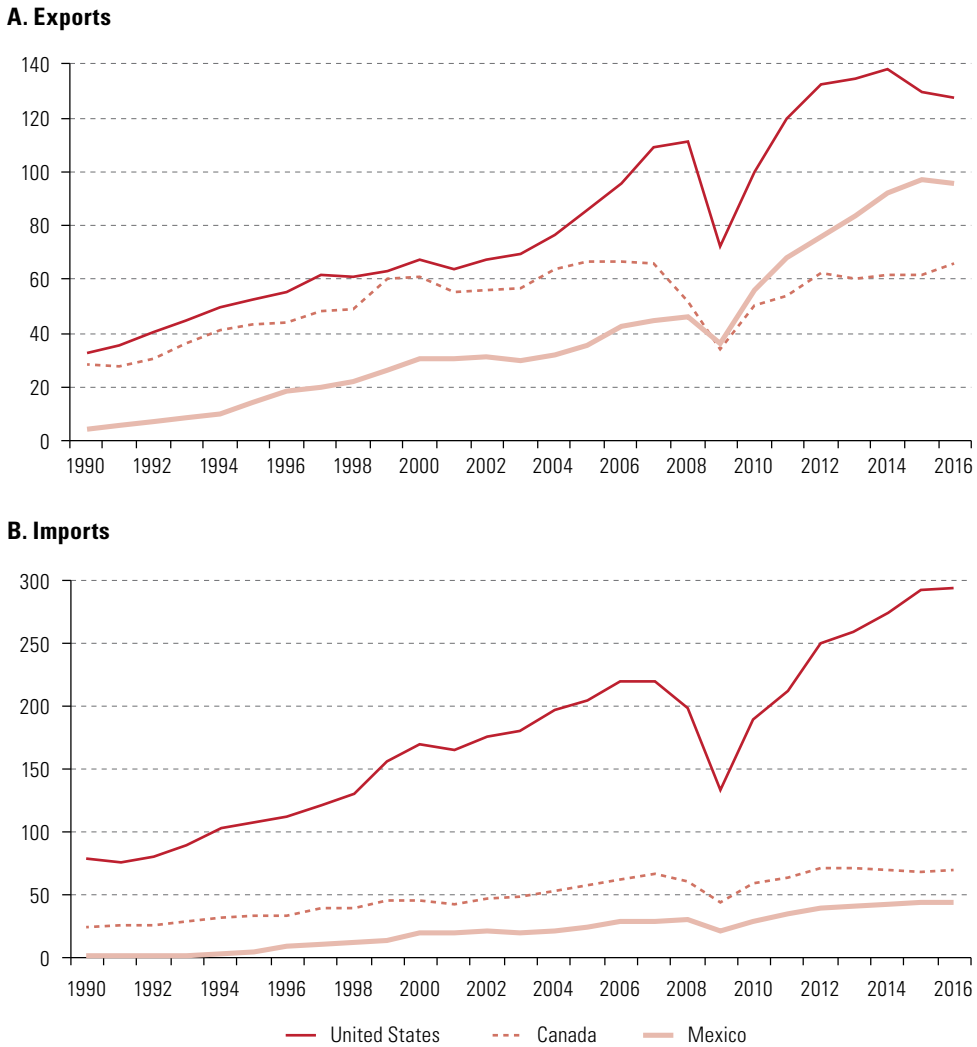


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

Trade flows of automotive products in North America show strong intraregional biases, which have been determined by the intra-industry relationships established in the regional production chain dominated by the major automakers and further strengthened by NAFTA: between 80% and 90% of United States automotive trade with its North American partners takes place at the intra-industry level (Wilson, 2011), and automakers and suppliers are highly dependent on inputs produced within the bloc itself (see figure III.9).[1]

After the 2008 crisis, intraregional trade picked up significantly, with the United States acting as the bloc's main exporter and importer. As the United States' trade deficit deepened and Canada's foreign trade balance turned negative, Mexico's exports recorded solid growth, overtaking Canada in 2009 and expanding the country's trade surplus in automotive products (see figure III.10).

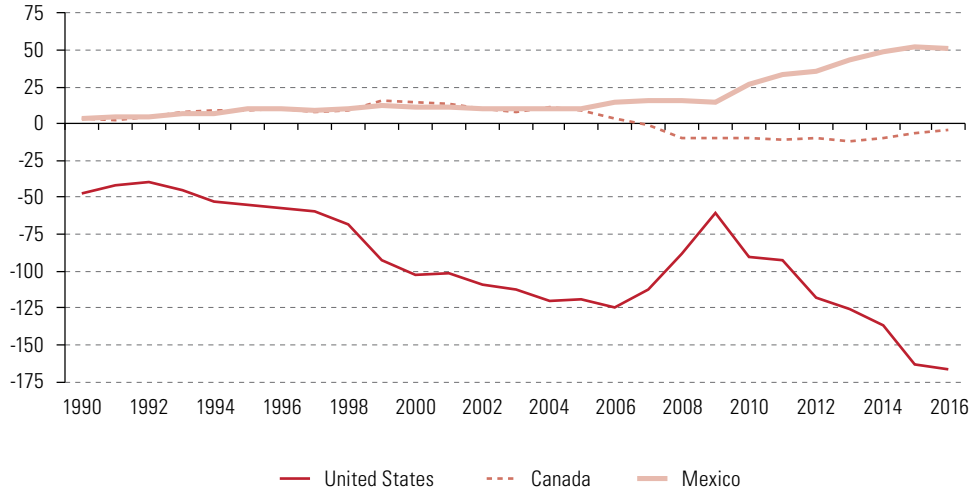
Figure III.10
North America: exports and imports of automotive products, and trade balance, 1990-2016
(Billions of dollars)



[1] In 2016, 78% of North American exports of automotive products were shipped to NAFTA member countries, while 55% of these imported goods came from within the bloc. For the same year, 94% of Canadian exports and 84% of Mexican exports of automotive products were shipped to the United States, which in turn was the source of 67% and 53% of Canadian and Mexican imports in this sector, respectively. Also, 60% of exports from the United States were shipped to México (20%) and Canada (40%), which in turn were the countries of origin of 48% of automotive products imported by the United States.

Figure III.10 (concluded)

C. Trade balance



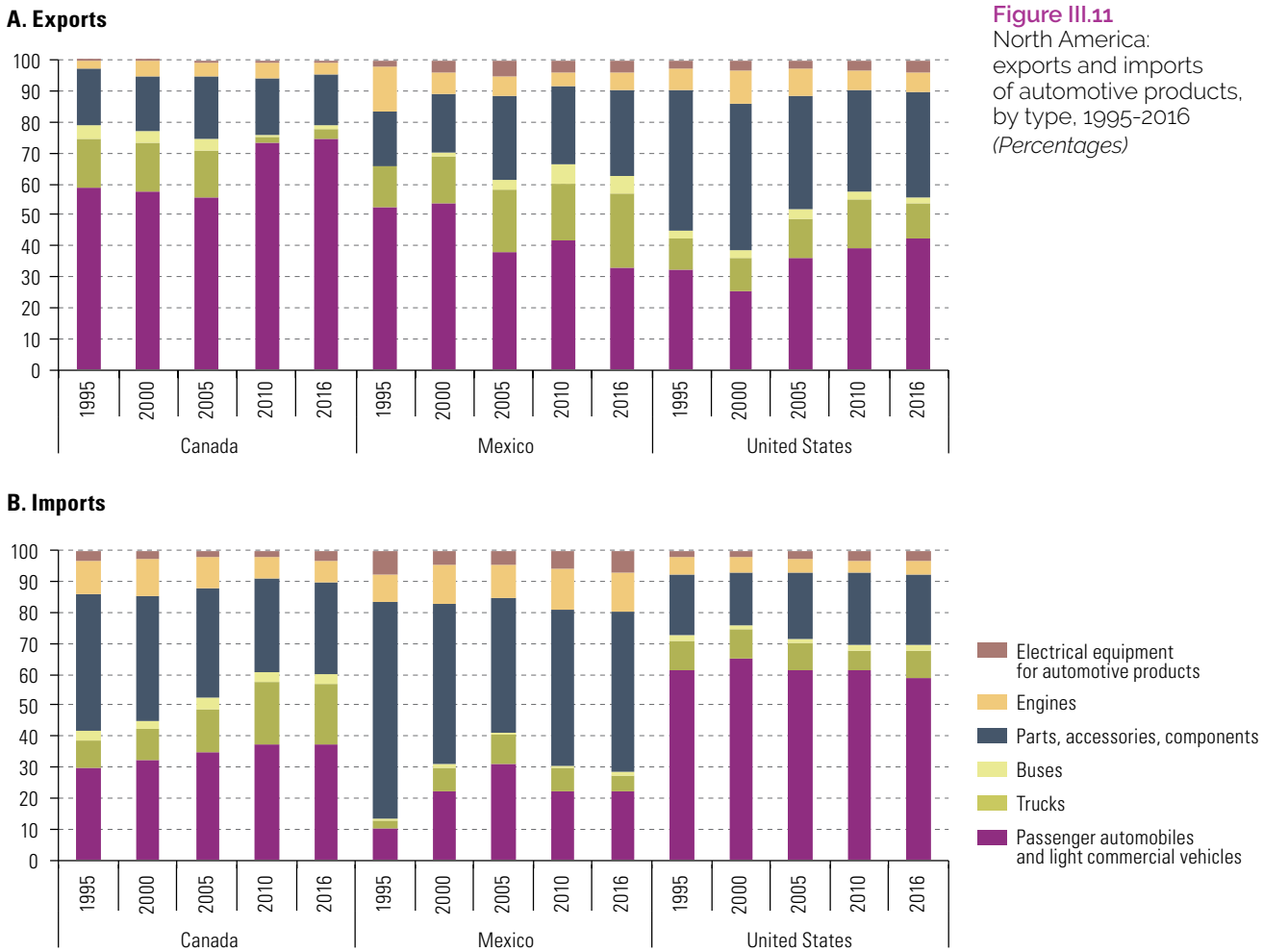
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

Close to 50% of exports and imports of automotive products in North America are related to light vehicles (i.e. passenger vehicles and light commercial vehicles) (see figure III.11). The United States is the main destination market, while Canada and Mexico are the first and fourth largest markets of origin, respectively. Autoparts and components for the automotive industry are manufactured and assembled in all three NAFTA countries, and these parts can cross the borders of member countries up to eight times before they are finally assembled in one of the three (Wilson, 2017). As a result of this deep commercial and manufacturing integration, up to 40% of the content of a vehicle manufactured in Mexico could have been originally made in the United States (CAR, 2016).

The relocation of auto manufacturing activities has also led to a geographical reorganization of the supply chain. Manufacturers have encouraged suppliers to locate as close as possible to their assembly plants in order to optimize response times, mitigate logistics costs and manage risk. Again, Mexico has benefited from the arrival of a great number of world-class suppliers, who in turn have enjoyed greater proximity to their end-clients, lower costs and a favourable financial and commercial environment (see figure III.5). The local production chain has thus been strengthened, as has Mexican value added to vehicles manufactured in the country. Moreover, many suppliers have established production capacities that exceed local demand and have therefore channelled their surpluses to export markets, which in turn has increased the intense cross-border trade of automotive parts and components and strengthened Mexico's position in the North American motor vehicle sector.

Between 2006 and 2015, suppliers invested US$ 48.4 billion in North America, through which they generated the capacity required to meet the needs of the expanding production of new vehicles. Of the total invested, US$ 44.4 billion were deployed in the construction and expansion of plants in the United States, which was 13 times more than the amount invested in Mexico (US$ 3.4 billion), which in turn was markedly above the investments made in Canada (US$ 580 million) (Sedgwick, 2016). In short, automotive production in North America has moved from Canada and the mid-west of the United States to the south-east of the United States and to Mexico.

Figure III.11
North America: exports and imports of automotive products, by type, 1995-2016
(Percentages)



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

Note: Automotive products per groups 778.3, 713.2, 784, 783, 782 and 781 of the Standard International Trade Classification (SITC), Rev. 3.

Between 2010 and mid 2016, automobile companies, including car manufacturers, invested some US$ 80.7 billion in the United States and close to US$ 25.8 billion in Mexico. Investments in the United States centred mainly on the Great Lakes region (62%) —led by General Motors, Ford and FCA— and on the southern states (19%), where Japanese, South Korean and European producers have a strong presence (AAPC, 2016). As discussed below, these figures cast doubt on assertions that the United States automobile industry has been destroyed by lower operating costs in Mexico.

B. A new business model: high-end vehicles for the global market

In the past 25 years the Mexican automotive industry has gone from being focused on satisfying the needs of its domestic market to become an export platform hosting the majority of the world's leading manufacturers and suppliers. Key to this deep transformation has been the combination of the country's trade openness, the signing of NAFTA and

active sectoral policies.[2] Hence, regulatory changes, proximity and preferential access to the United States, lower relative costs and the existence of a sizeable domestic market have paved the way for the arrival of large foreign direct investment (FDI) inflows. Between 1999 and 2016, automakers and their foreign suppliers invested over US$ 51.2 billion, close to 11% of total FDI received by Mexico (CNIE, 2017). Almost two thirds of this was invested by suppliers of parts and components, another third by light vehicle manufacturers, while heavy vehicle manufacturers accounted for 3% (see figure III.12). These investments have allowed Mexico to build a comprehensive production chain within its territory, which has also become highly integrated with the production base of the United States.

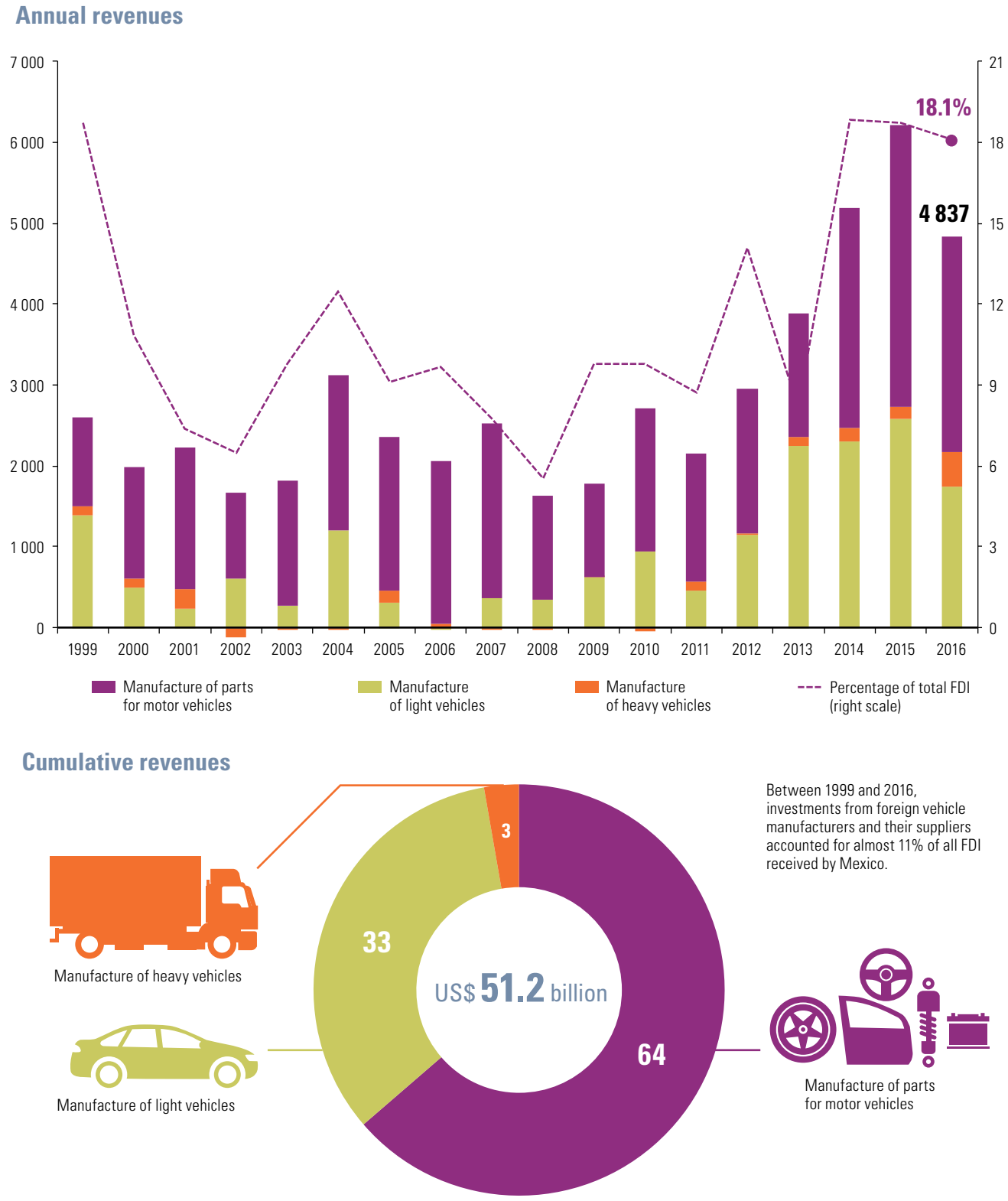
There are currently nine manufacturers active in Mexico, and others are expected to arrive before the end of the decade. The light vehicle end-use industry has established 20 manufacturing facilities in 14 states (see table III.1). In 2016, Kia (a subsidiary of Hyundai Motor) and Audi (a subsidiary of Volkswagen Group) opened new plants. Large FDI inflows in the past four years have yielded 10 new automobile plants, five belonging to newcomers (Audi, BMW, Kia, Daimler AG and Infiniti-Nissan) and the other five to incumbent manufacturers. Some of these plants are among the largest and most modern in North America, and in aggregate they will expand production by 450,000 units, potentially making Mexico the sixth largest car manufacturer in the world (ProMéxico, 2016). Additionally, and largely on account of 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-Nissan and Mercedes-Benz.

Production has been concentrated in three large regions, where it has expanded as a natural extension of the auto industry in the United States. Towards the middle of the twentieth century, the sector began developing in the centre of the country; later, as a result of Mexico's development policies, it grew in the northern border region and, after the 2008 crisis, it began expanding rapidly in the Bajío region States of Aguascalientes, Querétaro and Guanajuato. These three regions currently have similar shares of national production. To the north, the Monterrey-Saltillo corridor is home to the largest assembly plants in North America and accounts for almost 30% of national autopart production. In the Bajío region, the Guanajuato cluster stands out, with more than 300 firms, including General Motors and a Volkswagen engine plant in Silao, Mazda in Salamanca and Honda in Celaya. Volkswagen and Audi own large plants in the central region (Puebla and San José Chiapa), where a great number of suppliers can also be found (see table III.1).

United States manufacturers were the first to arrive in Mexico. Ford and General Motors, and later Chrysler, have been producing vehicles for the local market since the 1920s, taking advantage of Mexico's import substitution-based industrialization policies. Towards the end of the 1980s, when Japanese manufacturers arrived in the United States, Mexico became an ideally located hub for United States firms to increase their competitiveness over vehicles from Asia. In this context, and further buoyed by the signing of NAFTA, Mexico was rapidly transformed into an export platform. After the crisis of 2008, and as a part of their restructuring and recovery process, firms from the United States decided to strengthen their operations in Mexico, investing both in the modernization and expansion of their existing facilities and in the construction of new plants.

[2] In 1989, as part of the liberalization of its economy, Mexico issued a decree aimed at developing and modernizing its automobile industry. This new legal framework allowed for a reduction in the share of national components in vehicles and promoted foreign investment in order to foster greater competitiveness in the industry.

Figure III.12
Mexico: foreign direct investment (FDI) in the automotive industry, by subsector, 1999-2016
(Millions of dollars and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from Government of Mexico [online] http://www.gob.mx/se/acciones-y-programas/competitividad-y-normatividad-inversion-extranjera-directa.

Table III.1
Mexico: light vehicle assembly plants and estimated annual vehicle production, 2016 and 2022

Company	State	City	Launch year	Models	2016	2022
BMW	San Luis Potosí	San Luis Potosí	2019	Sedan S3 (2019)	-	135 753
Fiat Chrysler Automobiles (FCA)	Coahuila	Saltillo	2013	RAM, Promaster trucks	275 248	263 208
	México	Toluca	2011	Fiat 500, Dodge Journey, Fiat Freemont	224 751	203 484
Ford Motor	Sonora	Hermosillo	1983	Ford Fusion and Lincoln MKZ	328 480	337 640
	México	Cuautitlán	1964	Ford Fiesta	105 272	153 879
General Motors	Coahuila	Ramos Arizpe	1981	Chevrolet Captiva, Chevrolet Sonic, Chevrolet Cruze, Cadillac SRX, Chevrolet Equinox (2017) and Holden Captiva (2017)	139 565	202 073
	Guanajuato	Silao	1994	Chevrolet Silverado, GMC Sierra	378 938	324 509
	San Luis Potosí	San Luis Potosí	2008	Chevrolet Aveo, Pontiac G3, Pontiac Wave, Chevrolet Equinox (2017), Chevrolet Onix (2019) and Chevrolet Prisma (2019)	171 963	211 459
Honda	Jalisco	El Salto	1995	CR-V and HR-V (2017)	63 126	50 243
	Guanajuato	Celaya	2014	Honda Fit/Jazz and HR-V	144 569	170 109
Kia Motors	Nuevo León	Pesquerías	2016	Forte and Rio	244 503	250 000
Mazda	Guanajuato	Salamanca	2013	Mazda2, Mazda3 and Yaris R (Toyota)	207 563	200 125
Nissan	Aguascalientes	Aguascalientes	1982	Sentra, Versa, Note and March	460 077	241 227
	Aguascalientes	Aguascalientes	2013	Sentra Tiida	140 518	321 886
	Morelos	Industrial City of the Valley of Cuernavaca (CIVAC)	1966	NV200, NP300 Frontier, Versa, Tsuru	174 008	303 403
Nissan/Daimler	Aguascalientes	Aguascalientes	2017	Infiniti QX50 (2017) and Mercedes-Benz Class A (2018)	-	259 677
Toyota	Baja California	Tecate	2004	Tacoma	82 324	83 622
	Guanajuato	Apaseo el Grande	2019	Corolla (2019)	-	203 645
Volkswagen	Puebla	Puebla	1966	Beetle, Jetta, Golf and Tiguan (2017)	457 615	590 959
	Puebla	San José Chiapa	2016	Audi Q5	219 645	220 000
Total					3 818 165	4 726 901

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the companies and PwC, *Autofacts: Industry Update*, June 2016 [online] http://www.automotivelogistics.media/wp-content/uploads/2016/06/FVLNA16_Session1_Brandon%20Mason_Pwc.pdf.

- In the past 15 years, Ford has announced investments of some US$ 12 billion in Mexico, aimed at restructuring and expanding its assembly plants in Cuautitlán and Hermosillo, as well as opening a new engine plant in Chihuahua and a transmission plant in Guanajuato (see table III.2). Towards the end of 2016, Ford announced that in 20 or 30 years time it would transfer its entire production of compact vehicles from the United States to Mexico, and that it planned to deploy new production platforms to reduce manufacturing times, cut costs and speed up its time-to-market (*Detroit Free Press*, 2016). However, in early 2017, as a result of changes announced by the new Administration in the United States, the company started to change its strategy and eventually cancelled a US$ 1.6 billion investment it had earmarked to build a plant in San Luis Potosí, where it planned to manufacture the new generation of the Ford Focus (*El Financiero*, 2017a).
- In 2008, General Motors opened a new plant to manufacture the Chevrolet Aveo in San Luis Potosí, as well as other facilities to build transmissions and engines. By the end of 2014, once the situation of the parent company had stabilized after the crisis, General Motors announced an ambitious investment plan of US$ 3.6 billion over four years to modernize and expand its plants in Toluca, Ramos Arizpe, Silao and San Luis Potosí, especially its production platforms for light commercial vehicles and subcompact passenger vehicles. These resources, in addition to the US$ 1.4 billion announced the year before, took General Motors' investment in Mexico to US$ 5 billion (*Forbes México*, 2014).

- The crisis in 2008 affected Chrysler significantly and led to major changes in the company's ownership structure. Towards mid 2009 the firm finalized its partnership with Fiat, thus breathing new life into the company and its Mexico operations. In 2010, the new partnership announced an investment of US$ 550 million in the Chrysler plant in Toluca to begin production of the Fiat 500 model (*América Economía*, 2010). Also, US$ 1.085 billion were invested in the construction of a new plant in Saltillo to manufacture a new light commercial vehicle, the Ram ProMaster, and additional outlays of US$ 164 million were allocated for a new production line in one of the company's engine plants in Saltillo (*Vanguardia*, 2013).

Volkswagen and Nissan arrived in Mexico in the 1960s as the first non-United States manufacturers, and although they were initially attracted by the domestic market, they began exporting towards the end of the 1980s. Mexico's accession to NAFTA and the adoption of regulations related to subregional content in products led these companies to make large efforts and investments to develop networks of local suppliers with a view to access the United States market. At the same time, other large Japanese manufacturers channelled their investments towards the southern region of the United States instead. However, in the mid 1990s, Honda established its first plant in Mexico, followed by Toyota 10 years later. Both firms were looking to address specific market niches with limited levels of production. Japanese companies in North America sought to counter the strategy of United States and European companies by relocating their more technologically intensive production processes to increase productivity and cut costs in a bid to focus on higher quality vehicles. The commissioning of new plants in Mexico by Nissan, Honda, Toyota and Mazda, together with new investment announcements, was a clear example of the global reorganization process in which North America played a pivotal role (Álvarez, 2016).

- In 1966, Nissan opened a plant in the Industrial City of the Valley of Cuernavaca (CIVAC) in Jiutepec, State of Morelos, the first built by the company outside Japan. A second plant in Aguascalientes followed in 1982. Known as A1, it was modernized in the mid 2000s thanks to a US$ 1.3 billion investment. With a first-stage investment of some US$ 2 billion (Nissan, 2013), the company opened a third plant in 2013, also in Aguascalientes (A2), which is now considered among the best and largest in North America. Towards mid 2014, the Nissan-Renault Alliance and Daimler AG announced the construction of a new plant in Aguascalientes (known as the Cooperation Manufacturing Plant Aguascalientes project, or COMPAS) through an investment of US$ 1 billion for the production of the new generation of high-end Mercedes-Benz and Infiniti compact vehicles. This is Daimler's first North American light vehicle production plant with production based on its modular front architecture (MFA) platform.[3] Production of Infiniti models is set to begin in 2017, while roll-out of Mercedes-Benz vehicles is earmarked for 2018 (Nissan, 2015). Nissan is currently the largest manufacturer in North America, after overtaking historical leaders General Motors and Ford.
- Volkswagen's Mexican operations are located mainly in Puebla. After a series of expansions, the Puebla plant has become one of the industry's largest complexes in North America. In 2011 the German automaker began building a new engine plant in Silao, State of Guanajuato, and early in 2014 it announced the construction of an Audi brand SUV plant. Shortly after, it also announced plans to build a new version of the Tiguan model, with market launch penned for 2017, which would require an investment of close to US$ 1billion to expand

[3] The MFA platform allows changing the location of different components in the interior of vehicles, such as seats or ceilings. It is also designed to adapt to different propulsion systems: batteries, fuel cells, hydrogen tanks and even gas tanks. Early in 2018, Daimler AG aims to file a patent for its MFA technology and begin developing a vehicle powered by gasoline, gas, electricity and hydrogen.

and modernize the Puebla plant. This would enable the firm to deploy its new MQB (*modularer Querbaukasten*) architecture, based on a modular transversal building block. In light of these projects, the lion's share of the US$ 7billion that the German manufacturer planned to invest in North America will be deployed in Mexico, with a clear intention to boost the high-end segment and update —through the use of its MQB technology— the production platforms for its subcompact passenger vehicle models Golf, Jetta and Bora. The firm's plants in Puebla are its largest manufacturing operations outside Germany.

- Honda began manufacturing and exporting vehicles out of Mexico in 1995, firstly with the Accord and, as of 2007, with its light commercial CR-V model. In 2014 the firm opened a new assembly plant in Celaya for the production of its compact Honda Fit and, later on, the HR-V crossover, as well as a transmissions plant. Both projects represent a total investment of some US$ 1.27 billion, and include the deployment of the firm's new global small platform (GSP) (*El Financiero*, 2014). However, by mid 2016, Honda announced that it would be moving production of the CR-V from Jalisco to Indiana, United States, and that the Jalisco facility would be used to manufacture its HR-V model, as at the Celaya plant (*El Economista*, 2016a).
- Toyota began manufacturing vehicles in Mexico in 2004 after opening a plant in Baja California on the back of a US$ 140 million investment. Initially, the plant produced approximately 30,000 Tacoma pickup trucks and by 2015 its output had grown to approximately 100,000 units. That same year Toyota announced that it would invest US$ 150 million to increase its Tijuana plant's annual production to 160,000 units by 2018 and improve its production platform architecture (*El Financiero*, 2015a). At the same time it announced a US$ 1.0 billion investment to build a new plant for the production of its Corolla model in Celaya, State of Guanajuato, as of 2019. This latest investment is part of Toyota's strategy to realign its North American operations, in which Mexico now has an increasingly important role (*El Financiero*, 2015a). Aside from the new plant, Toyota announced investments totalling US$ 240 million for the assembly of its new compact Toyota Yaris at the Mazda facility in Salamanca, State of Guanajuato (*El Economista*, 2015).

Table III.2
Investment announcements by light vehicle manufacturers in Mexico, 2003-2016
(Millions of dollars)

	2003-2010	2011	2012	2013	2014	2015	2016	Total
Ford	6 942	1 300	59		1 200	1 300	377	11 178
General Motors (GM)	2 490	840	231	560	3 617			7 737
Nissan	3 109	2 000	377	491	408	40	43	6 468
Daimler AG	3 406	753	320	1 435	1			5 914
Hyundai Motor	702	377		2	3 013	889	753	5 735
Volkswagen	2 221	1	7	118	10	420	1 377	4 154
Toyota Motor	190				753	753	160	1 856
Fiat Chrysler Automobiles (FCA)	120		525	193	377	158		1 373
Honda	550	800	77	470	35			1 932
Mazda	660	377						1 037
BMW	10		1 013					1 023
Total	**20 399**	**6 448**	**2 608**	**3 269**	**9 413**	**3 560**	**1 710**	**47 406**

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

Over the past five years, the impetus of the Mexican automotive industry and the improved expectations for the United States market have both spurred other firms to launch manufacturing operations in Mexico. Among the new entrants there are two clearly distinguishable groups: one made up by Kia and Mazda, focused on manufacturing compact vehicles, and the other comprising Audi, Mercedes-Benz, Infiniti and BMW, devoted to the high-end segment. The global approach shared by these new entrants stands in contrast with previous initiatives, which followed a more regional strategy.

- Towards the end of 2011, Mazda committed to investing US$ 500 million for the construction of a new plant in Salamanca, State of Guanajuato. Three years later, the plant began manufacturing the Mazda2 and Mazda3 models, with a production capacity of 140,000 units, which by 2016 had risen to 250,000 units (*El Financiero*, 2015b). Mazda's Mexican operations have prioritized internal combustion engine models based on the SKYACTIV platform.[4] Under its strategic alliance with Toyota, the firm also manufactures the Yaris R model (*El Universal*, 2015).
- Towards the end of 2014, Kia —a subsidiary of the South Korean automaker Hyundai— began building a new plant in Nuevo León, the marque's first in Latin America. After an investment of some US$ 3billion, Kia began rolling out its Forte model in 2016 and the Rio in early 2017, reaching a total annual production of approximately 300,000 units (*El Universal*, 2016a).
- Towards the end of 2016, after a four-year construction period, the Volkswagen subsidiary Audi opened a new plant in San José Chiapa, State of Puebla. Made possible by a US$ 1.3 billion investment by Volkswagen, this is the first luxury automobile production plant in Mexico. Production of the new version of the Q5 SUV has been planned for the facility, with a target of 150,000 units by the end of 2017. The plant will be able to draw on 180 suppliers, 60 of which are newcomers to Mexico and the remainder incumbent manufacturers; hence, national components will make up 71% of the Q5. This will allow the automaker to comply with the various free trade agreements that Mexico has entered into and, at the same time, produce a totally global product (*El Universal*, 2016b). This plant uses Volkswagen's MLB (*modularer Längsbaukasten*) platform —a longitudinal construction block for high-end vehicles with a longitudinal front engine and front-wheel or all-wheel drive— allowing the use of the same electrical and mechanical components for different models.
- Towards mid 2014, BMW announced an investment of US$ 1 billion to build a plant in San Luis Potosí, which will begin operations in 2019. The facility will have an annual production capacity of 150,000 units and will be used to assemble the BMW 3 Series (BBC, 2017a).
- Almost simultaneously, Daimler AG and the Renault-Nissan Alliance entered into the Cooperation Manufacturing Plant Aguascalientes joint venture (COMPAS) to build and operate a new plant in Mexico using the MFA platform. With an annual production capacity of 230,000 vehicles, roll-out of Infiniti models is set for 2017, with Mercedes-Benz models following a year later (*Vanguardia*, 2015).[5]

For a long time Mexico's automobile industry was centred on the production of mass-market subcompact vehicles. The opportunities afforded by lower local costs encouraged international manufacturers to transfer a large proportion of the passenger vehicles they produced for sale in the United States to Mexico, most particularly their cheaper models. However, on the back of an increasingly larger and sophisticated network of suppliers and

4 The SKYACTIV platform is characterized by its flexibility and use of advanced engine and transmission technologies.

5 The Daimler-Renault-Nissan strategic partnership began in 2010 with engine projects in North America and compact cars in Europe, but the addition of the Mexican initiative has transformed it into a truly global cooperation effort.

without abandoning its established large scale operations, Mexico has in recent years begun targeting more demanding segments, such as CUVs, SUVs and pickups. It has achieved this through sizeable investments in state-of-the-art platforms, which allow high degrees of flexibility in the scaling up of production to manufacture models that are increasingly geared towards the global market. Additionally, and in response to the demands of the United States market, Mexican vehicles now incorporate the latest technological advances in connectivity and passenger entertainment, thus establishing the foundations for some of the key features of tomorrow's industry, such as electric-powered and self-driving vehicles. The recent arrivals that specialize in high-end automobiles will be key players in this new scenario insofar as their more global production outlook will support Mexico's commercial diversification, foster the arrival of new suppliers and strengthen the country's research, development and innovation activities.

C. Strengthening the network of suppliers

Up until the 2008 crisis, the Mexican automotive sector had one significant vulnerability: its high dependency on imported inputs and an inadequate and weak network of local suppliers. However, in recent years, the parts and components industry has been the recipient of record investments (see figure III.12), which have translated into the expansion and modernization of the country's productive base and paved the way for the arrival of over 700 new suppliers (*Expansión*, 2016) (see table III.3).

Table III.3

Investment announcements by automotive industry suppliers in Mexico, 2003-2016
(Millions of dollars)

	2003-2010	2011	2012	2013	2014	2015	2016	Total
Robert Bosch GmbH	570	43		460		683	109	1 865
Magna International Inc.	339	100		108	208	159		914
Halberg Précision	600							600
DPH Holdings (formerly Delphi)	43	54	73	305		43	75	594
Caterpillar			500					500
Getrag Group	500							500
PPM Shenzhen						500		500
Johnson Electric			335			149		484
Yazaki Group		183	1	43	2	3	152	384
GKN			12	18	343			372
ThyssenKrupp (TK)						180	176	356
Continental AG	62		43	72	25	95	31	329
Commercial Vehicle Group	43	50					229	322
Autoneum				43		43	217	304
Hitachi	25	100	100		77			302
Total	2 183	531	1 064	1 049	654	1 857	989	8 328

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

German autoparts firm Robert Bosch GmbH, the largest supplier in the world, is the main investor in the Mexican autoparts sector and has operated in the country for over 60 years (see table III.3). In the last 10 years it has invested more than US$ 400 million, and expects to invest another US$ 500 million between 2016 and 2020. Through these investments, it has been building its production capacity to satisfy the growing demand for high-tech automobile parts in North America and Latin America (Bosch, 2016). Bosch owns 10 manufacturing plants in Mexico, with the largest in Toluca and Ciudad Juárez. In 2013 it announced investments of US$ 300 million to increase the capacity of its Toluca plant and focus most of its efforts on the supply of electric motors and gasoline systems for the North American market (Bosch, 2013). Apart from its Toluca plant, between 2015 and

2016 the firm also expanded its facilities in Ciudad Juárez, Hermosillo, Aguascalientes and San Luis Potosí with investments totalling US$ 150 million. Early in 2016, it announced the construction of a new plant in Querétaro, where it plans to invest US$ 80 million. Operations at this plant are planned to begin in late 2017 and will focus on state-of-the-art steering systems that offer driver assistance features and reduced fuel consumption (Bosch, 2016).

Bosch's case is illustrative of the healthy momentum in the autoparts sector, which has been the recipient of huge investments by domestic and foreign companies. Of the top 15 suppliers worldwide, 14 are present in Mexico (see table III.4). In that context, Mexico plays an increasingly important role in the well-organized North American cross-border production system. These dynamics have helped the industry generate deep linkages within the Mexican economy and a deeper relationship with that of the United States, which in turn has contributed to the progressive transformation of the country from a vehicle assembly platform to a more integrated production system that is therefore more sustainable.

Table III.4
North America: production plants for autoparts manufacture of major global suppliers, by country, 2017
(Number of plants)

Company	Country of origin	Mexico	United States	Canada
Robert Bosch GmbH	Germany	4	20	1
Denso Corp.	Japan	4	22	-
Magna International Inc.	Canada	2	3	7
Continental AG	Germany	16	52	4
ZF Friedrichshafen AG	Germany	11	29	3
Hyundai Mobis	Republic of Korea	-	4	-
Aisin Seiki Co.	Italy	4	19	-
Faurecia	France	13	21	1
Johnson Controls Inc.	United States	10	...	...
Lear Corp.	United States	22	21	-
Valeo SA	France	8	15	-
Delphi Automotive	United States	46	...	...
Yazaki Corp.	Japan	13	16	2
Sumitomo Electric Industries	Japan	5	2	1
JTEKT Corp.	Japan	1	12	1

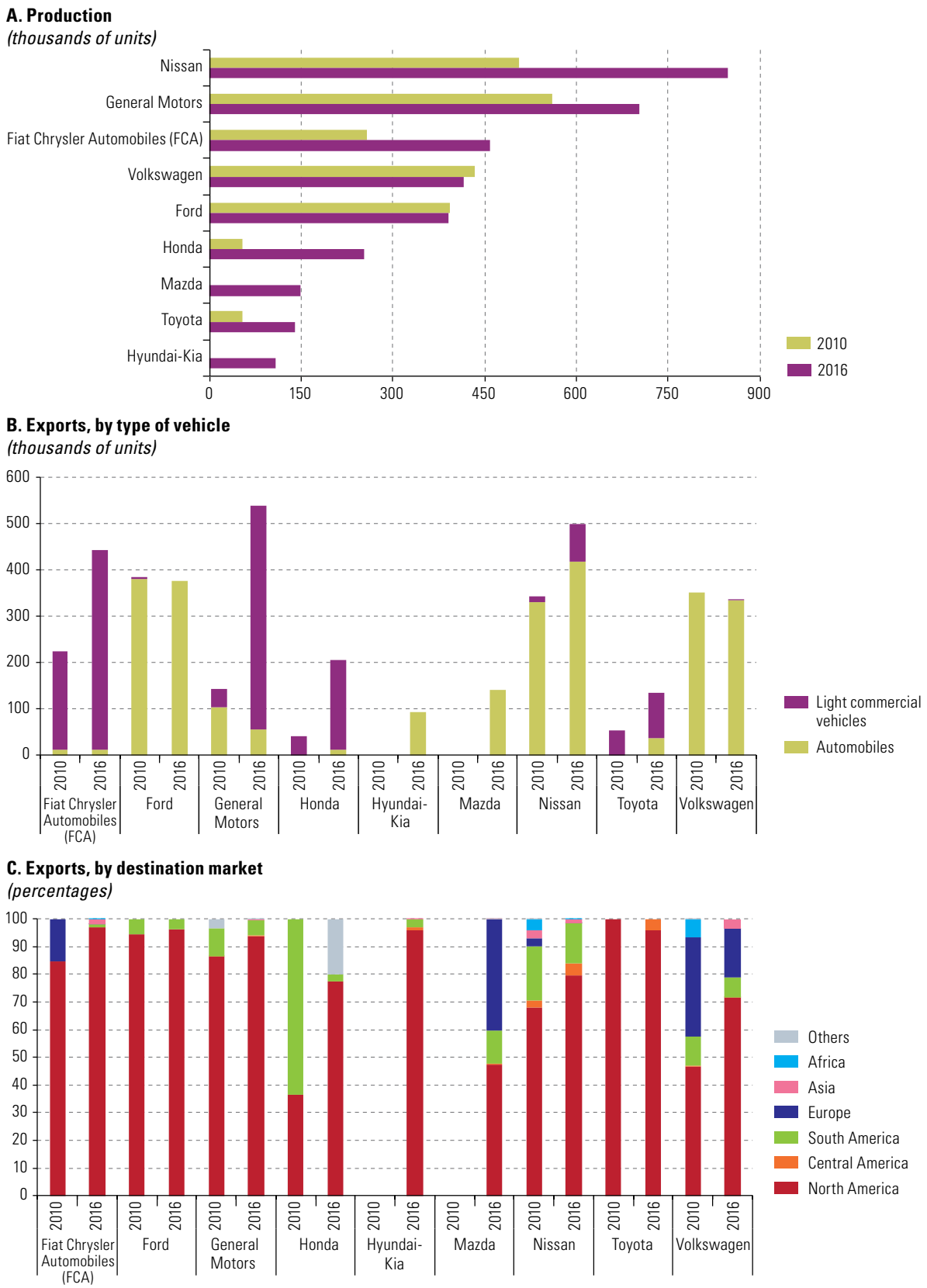
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information provided by the companies.

D. Mexico reaches record levels of production, exports and domestic sales, but faces capacity-building limitations

Production of light vehicles in Mexico increased significantly from 1.6 million units in 2005 to 3.5 million units in 2016 through solid investments by manufacturers and suppliers. In 2016, the country achieved historical milestones in production, exports and domestic vehicle sales (see figure III.2). With those results, Mexico has consolidated its position as the largest producer in Latin America —easily outstripping Brazil— and the seventh in the world, apart from being the fourth largest exporter of automotive products (see chapter II).

During the 2000s and leading up to the global crisis in 2008, General Motors was the dominating force in both production and exports. From 2008 onwards, Nissan became the largest producer, but General Motors continued to be the main exporter, followed by Nissan, FCA and Ford (see figure III.13A and table III.5). At the same time, Volkswagen began steadily increasing its production for export, bringing in new models widely accepted in the United States, such as the Jetta, Golf and New Beetle. In fact, Volkswagen's Mexican operation is an export platform for models exclusively manufactured in Mexico and aimed at every market in the world.

Figure III.13
Mexico: production and exports of light vehicles, by manufacturer, 2010-2016

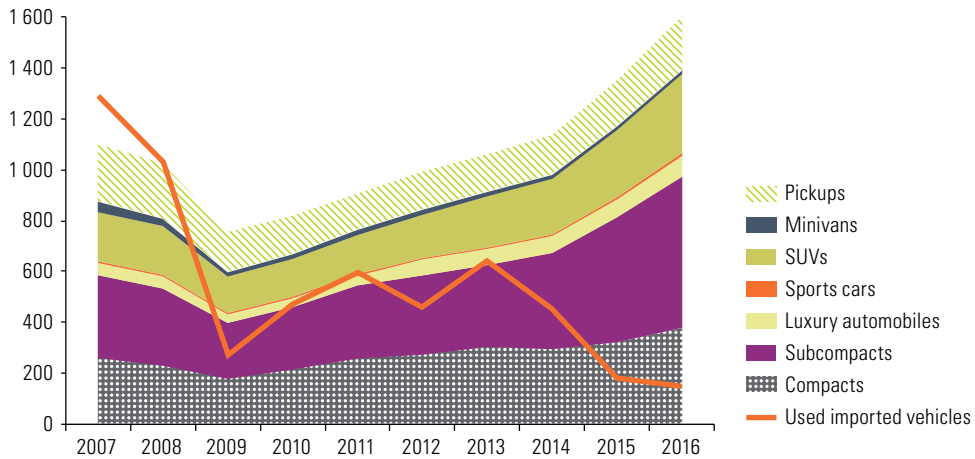


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from Mexican Automotive Industry Association (AMIA) and Mexican Association of Automobile Distributors (AMDA).

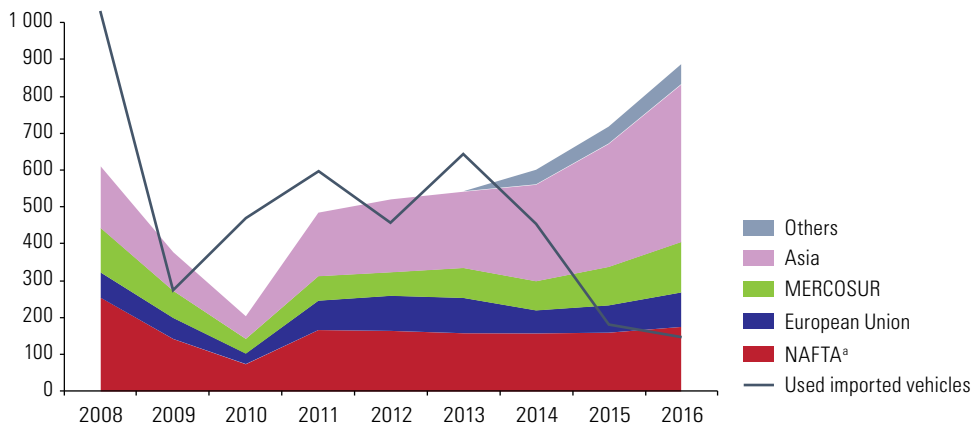
A significant part of the production of all manufacturers operating in Mexico is earmarked for export. Ford and FCA have the highest export propensity, with more than 90% of their production targeting external markets, mostly in North America. Production, and therefore exports, of manufacturers that operate in NAFTA member countries complement each other so as to satisfy the needs of different market segments. GM and FCA specialize in larger vehicles, such as CUVs, SUVs and pickups, while Ford focuses on subcompact passenger automobiles (see figure III.13B). In turn, Volkswagen's decision to produce certain models exclusively in Mexico means that it maintains a high export propensity as well as a greater market diversification compared with its competitors (see figure III.14).

Figure III.14
Mexico: characteristics of the domestic motor vehicle market, 2008-2016
(Thousands of units)

A. Domestic sales by type of vehicle and imports of used vehicles



B. Imports of new vehicles, by origin, and imports of used vehicles



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

[a] North American Free Trade Agreement.

Table III.5
Mexico: production, exports, domestic sales and imports of light vehicles, by manufacturer, 2000-2016
(Thousands of units)

	Company	2000	2005	2010	2013	2014	2015	2016
Production	Nissan	313	363	506	680	806	823	848
	General Motors	445	428	559	646	678	690	703
	Fiat Chrysler Automobiles (FCA)	405	344	257	439	500	504	459
	Volkswagen	426	300	435	516	475	458	415
	Ford	281	148	394	525	443	434	391
	Honda	19	24	55	63	144	204	254
	Mazda					102	182	149
	Toyota			54	64	71	105	139
	Kia							108
Exports	Nissan	154	155	344	450	539	519	500
	General Motors	325	333	460	526	554	540	540
	Fiat Chrysler Automobiles (FCA)	372	340	224	402	466	477	443
	Volkswagen	340	242	351	424	398	393	334
	Ford	235	107	385	520	427	413	377
	Honda	7	15	41	38	105	162	206
	Mazda				0	84	154	140
	Toyota			54	64	71	101	135
	Kia							93
Domestic sales	Nissan	173	235	190	264	293	349	403
	General Motors	217	250	156	202	217	256	309
	Fiat Chrysler Automobiles (FCA)	112	124	79	96	89	103	104
	Volkswagen	169	149	130	190	195	219	247
	Ford	144	191	89	87	81	90	102
	Honda	24	38	38	58	60	74	88
	Mazda			25	33	41	57	55
	Toyota		35	47	61	70	85	105
	Kia					12	37	94
Imports	Nissan	14	27	27	34	26	45	56
	General Motors	97	155	56	82	92	106	145
	Fiat Chrysler Automobiles (FCA)	79	121	45	59	54	76	88
	Volkswagen	83	91	46	98	118	154	167
	Ford	98	150	81	82	65	69	88
	Honda	13	29	24	33	21	32	40
	Mazda			25	33	23	29	46
	Toyota		35	47	61	70	81	101
	Kia					12	37	80

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

Japanese carmakers with manufacturing capacity in the south of the United States have opted for a clear segmentation of their Mexican production. Honda, Mazda and Toyota have concentrated on a limited range of models: CUVs, compact automobiles and pickups, respectively. Nissan, however, has adopted a different policy insofar as the largest share of its production targets the Mexican end-market. The firm also has the lowest import ratio to complement its local offerings. In fact, of the 11 best-selling models in the Mexican market in 2016, 5 were manufactured locally by Nissan. In that same year, only 56% of the firm's output was shipped to international markets, mostly North America (80%) and South America (15%) (see figure III.13C).

In contrast with the United States and due to per capita income levels in Mexico, the domestic market is dominated by compact and subcompact (medium-sized) passenger vehicles, which in 2016 accounted for 24% and 37% of domestic passenger vehicles sales, respectively (see figure III.14A). Given that Mexican production is conditioned by consumption patterns in the United States, a large part of its domestic market is served by imports, mainly of compact models manufactured in Asia and in the Southern Common Market (MERCOSUR) (see figure III.14B).

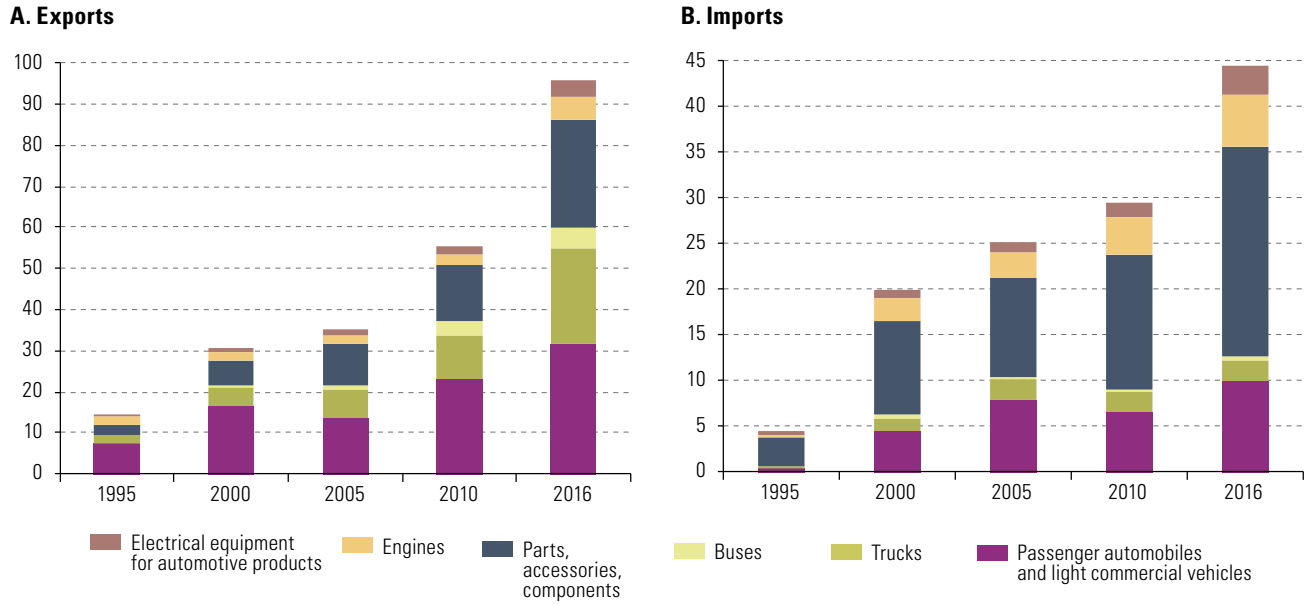
Nissan and General Motors dominate the Mexican domestic market: the first, by virtue of its domestic production, and the second, through the vehicles it manufactures in other parts of the world —especially Asia— and imports to Mexico. Nissan managed to position itself in the domestic market thanks to the wide acceptance of certain models that have remained among the top sellers for several decades, in particular the Tsuru, which was launched in 1984.

The domestic market has been recovering steadily since the crisis of 2008. First, more stringent controls on imports of used vehicles from the United States were put in place in order to counter the alarming level reached by those imports between 2005 and 2009, which seriously affected manufacturers and importers of new vehicles. In 2011, the government issued a decree regulating imports of used vehicles, requiring certificates of origin and compliance with certain physical and mechanical conditions, as well as pollution standards and other requirements (*El Economista*, 2016b). This measure reduced the share of these vehicles in the total number of automobiles traded from 66% in 2011 to 9% in 2016 (see figure III.14). Also, the favourable expectations for the Mexican market and the changes in consumption patterns in the United States led to an expansion in automakers' supply of locally manufactured compact models: the Fiat 500 by FCA, the new versions of the Aveo and the Sonic by General Motors, the Mazda2 and Nissan Versa, to name a few.

Mexico has also recorded solid results in a smaller albeit still important production segment, that of heavy vehicles. Manufacturers carry out assembly, stamping and bodywork activities, producing a wide range of trucks for export and the domestic market. There are in total 11 manufacturers of heavy vehicles in Mexico and 2 companies specialized in engines that are active in 8 states (ProMéxico, 2016). As in the case of light vehicles, NAFTA has been a key determinant in the performance of this segment. Mexico manufactured 150,889 units in 2016, after reaching a record 190,978 units in 2015 and consolidating its position as the fifth largest global manufacturer in this category after China, Japan, India and the United States. Between 2005 and 2016, the share of heavy vehicles in total Mexican exports of automotive products increased from 3% to 6% (see figure III.15), and the country's share of heavy vehicle production in North America grew from 17% in 2006 to 35% in 2016.

Between 2009 and 2016, production of autoparts in Mexico increased in value terms from US$ 41.2 billion to US$ 88.4 billion (Export, 2016). The expansion of vehicle production has spurred greater demand for parts and components, and the enhanced technological sophistication incorporated into vehicles has also broadened the scope of products that manufacturers are now demanding from their suppliers. Furthermore, many of the first- and second-tier suppliers that have historically served automakers located in Mexico have been compelled to follow them and invest close to their Mexican plants so as to secure new supply contracts or hold on to existing ones. Thus Mexico is now the world's sixth largest autoparts manufacturer, closely behind the Republic of Korea. Mexican autoparts production could reach US$ 100 billion in value terms by 2020, which could take it to the fourth position globally behind China, the United States and Japan, and above the Republic of Korea and Germany (Albín, 2016).

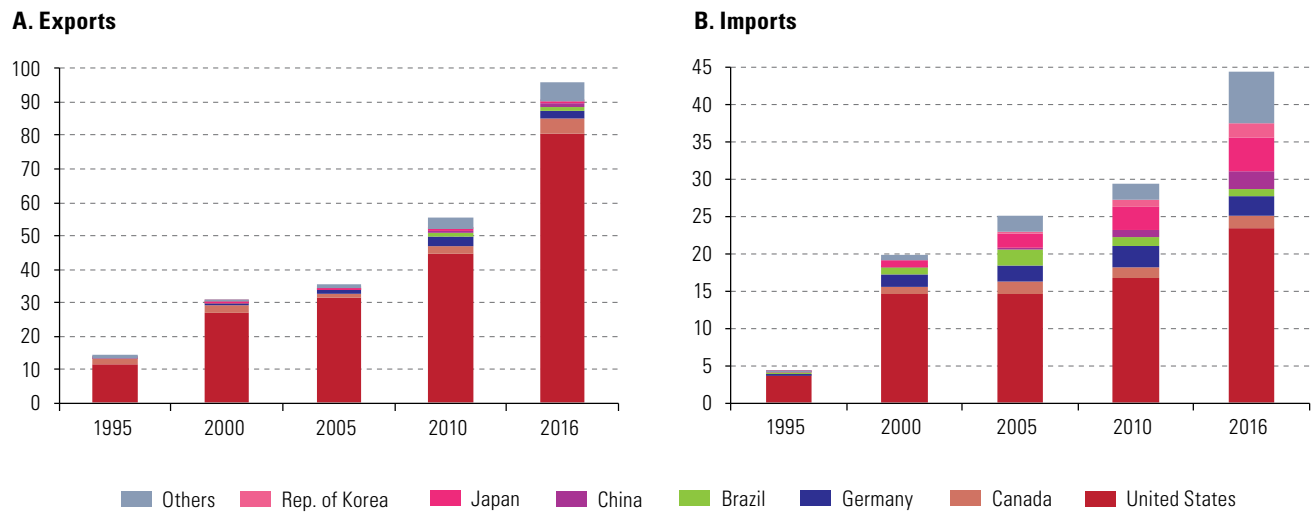
Figure III.15
Mexico: exports and imports of automotive products, by type of good, 1995-2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).
Note: Automotive products per groups 778.3, 713.2, 784, 783, 782 and 781 of the Standard International Trade Classification (SITC), Rev. 3.

Autoparts firms do not only serve the needs of manufacturers operating in Mexico. Between 2009 and 2016, exports of autoparts increased significantly from US$ 9.298 billion to US$ 26.273 billion (see figure III.15). Despite the large number of free trade agreements that Mexico has entered into, it lacks diversity in the markets where it sells its autoparts, with more than 90% of production exported to the United States and Canada (see figure III.16). In 2015, Mexico was the fifth largest exporter of autoparts in the world, behind Germany, the United States, Japan and China. In 2016, 60% of autoparts imported by Mexico came from the United States, followed by Japan (10%), China (7.3%), the Republic of Korea (5%) and Germany (4.3%).

Figure III.16
Mexico: exports and imports of automotive products, by geographical origin and destination, 1995-2016
(Billions of dollars)



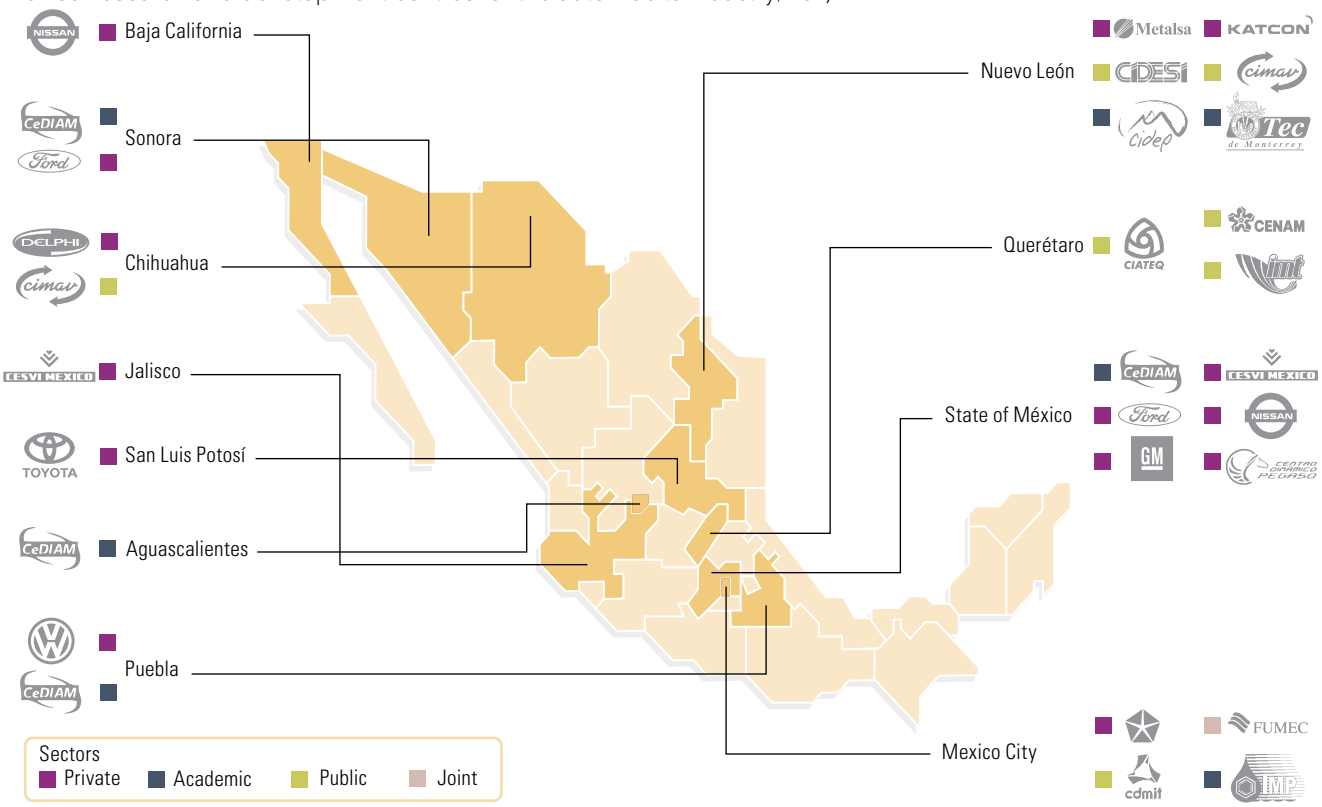
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Commodity Trade Statistics Database (COMTRADE).

More than 90% of the world's top 100 autoparts suppliers have operations in Mexico (Sedgwick, 2016). The 10% that is absent corresponds to Chinese companies currently undergoing intense restructuring and consolidation processes. In total, there are some 1,400 autoparts suppliers operating at present in Mexico, 65% of which are foreign firms (ITA, 2016), with the majority being from the United States (29%), Japan (27%) and Germany (18%) (INA, 2015). Of these, 600 are first-tier companies, meaning they have the capacity to fully satisfy the needs of manufacturers operating in Mexico. However, there are only 400 second-tier suppliers, and another 400 in the third tier, which in aggregate falls short of the volume needed to satisfy the industry's present and future demand (*Modern Machine Shop*, 2017). With a few exceptions, most domestic autoparts suppliers have been unable to adapt to a more competitive environment, although it seems that the industry on the whole is beginning to increase its capacity (CEIGB, 2017). Despite manufacturing autoparts worth over US$ 88 billion —with exports valued at close to US$ 26.3 billion— Mexico still has to import second- and third-tier inputs valued at US$ 23 billion, such as electrical components, harness parts, fabrics, leather and vinyl for seat upholstering, seat-belt components, airbags and tyres.

Although production costs have been the main driver of the Mexican motor vehicle industry's expansion, there are other relevant competiveness factors behind its growth and future sustainability: (i) higher levels of local value added owing to technical progress and the strengthening of the production chain, thanks to a greater number of engineers and the increased use of qualified labour, (ii) greater flexibility to respond to demand, and (iii) inclusion of substantial innovations, especially in the production of new models.

Alongside its productive capacity, Mexico has also deployed a broad network of support centres for the industry, addressing issues of design, innovation, scientific and technical development, as well as materials and products testing.

Map III.1
Mexico: research and development centres for the automobile industry, 2017



Source: ProMéxico, *La industria automotriz mexicana: situación actual, retos y oportunidades*, Mexico City, Secretariat of Economic Affairs of Mexico, October 2016 [online] http://www.promexico.mx/documentos/biblioteca/la-industria-automotriz-mexicana.pdf.

There are currently 28 research and development centres, 13 private centres associated with major manufacturers and suppliers, 7 centres related to academic institutions, 7 public centres and 1 public-private partnership, including:

- The Querétaro Centre for Research and Technical Assistance (CIATEQ): created by the federal government in conjunction with the National Council for Science and Technology (CONACYT), the National Laboratories for Industrial Development (LANFI), the government of the State of Querétaro and the business community in the region led by Grupo ICA and Grupo SPICER. CIATEQ provides technological support for the automobile and autoparts industries, covering basic engineering, manufacturing machinery and specific purpose equipment, tools, control and measurement systems, prototypes, as well as developing purpose-built vehicles.
- The Nissan Technical Centre (NISTEC) began operating in the mid 1990s in Toluca, State of México. NISTEC belongs to Nissan's worldwide R&D network and works in close cooperation with other centres located in the United States and Brazil, with which it shares responsibilities; the Mexican centre is devoted to parts design and vehicle testing. NISTEC has invested mainly in testing equipment for parts and vehicle development and for emissions calibration and checking, with a target of cutting engine emissions by 70% (ProMéxico, 2016). Among other facilities, NISTEC has a testing track at the Aguascalientes plant, as well as gas emissions laboratories in Mexico City and Manzanillo.
- The Chrysler Centre for Research, Development and Testing of Automotive Engineering was opened in 2005, in Santa Fe, Mexico City, to develop and test new Dodge, Chrysler, Jeep and Mitsubishi models. It specializes in vehicle testing, engine dynamometers and transmissions, and has emissions testing laboratories and a metrology and materials engineering laboratory. It works at the technological forefront in areas such as environmentally friendly materials, alternative fuels and reducing the emissions and consumption of conventional engines.
- The Centre for Vehicle Electronic Technology (CTEV) was opened in 2006 in Guadalajara, Jalisco, as a joint venture between the Western Institute of Technology and Higher Education (ITESO) and the company Soluciones Tecnológicas. CTEV specializes in the development of electronic systems for automobile applications and is gradually moving towards the technological forefront in areas such as electronic components and software.
- The Centre for Research in Advanced Materials (CIMAV) was opened in Chihuahua in 1994 and is part of the National System of Public Research Centres of CONACYT. It was created through an agreement between the federal government, the government of the State of Chihuahua and the delegation of Chihuahua to the National Chamber of Manufacturing Industries.

Mexico's R&D network has its strengths and weaknesses. It is a reasonably well-organized system made up of federal and state agencies, private companies and academic institutions which are grouped around a common set of objectives. However, these centres are quite heterogeneous in terms of their specializations, funding, human resources, relationships with international networks, institutional histories and the updating of their technological capabilities. Additionally, they have developed most of their competencies in key areas of traditional auto manufacturing and therefore may require greater investment levels to align their targets with the most recent trends that are changing the entire industry (see chapter II).

E. Caught between the technological revolution and policy changes in the United States

Two sets of factors must be considered when analysing the prospects of the Mexican automotive industry. On the one hand is the transformation driven by the technology revolution under way in the global motor vehicle industry, along with changes in the concept of mobility and consumption patterns and regulatory pressure in the fields of safety, the environment and energy efficiency. On the other hand is the uncertainty triggered by the announcements of the new Administration in the United States in relation to the industry.

1. The technological revolution and competitiveness: robotics

Mexico has received major investments in recent years, which have helped it expand and modernize its base of automobile manufacturers and suppliers. The country has transitioned from being a low-cost export platform to become a well-organized production system that hosts the industry's main global players and is closely integrated with the North American economy, especially that of the United States. Mexico is consequently an important member of one of the three main regional clusters that account for a substantial share of global motor vehicle production, innovation and R&D activities.

The Mexican sector specializes in manufacturing subcompact passenger cars and light commercial vehicles aimed at the United States market and is at the technological forefront of the production of medium-sized conventional automobiles. In addition, the arrival of high-end manufacturers (Daimler AG, Volkswagen-Audi, BMW and others) has contributed to the development of a denser productive fabric, with some suppliers providing electronic- and software-intensive components.

This virtuous process could nonetheless be threatened by the latest trends in the global automotive industry. First of all, although Mexico has been able to attract many leading global carmakers and a large number of first- and second-tier suppliers, it still lags behind in terms of third- and fourth-tier companies. This points to the weakness of the local production structure, especially in relation to small and medium-sized high-tech, knowledge-intensive companies. Not only does this represent a lost opportunity to build local value added into automotive products, it also limits the spillover of indirect production and technology benefits to the rest of the local economy.

A second, related factor is the creation and optimization of local capabilities in human resources, science, technology, innovation and enterprise development. Mexico has made notable progress on these fronts, but not enough given the fast pace of the industry and of capacity-building in these areas in other parts of the world, especially China. A denser industrial fabric and more solid local capacities would lessen the risks to the Mexican automotive industry from the changes beginning to occur in the sector.

In addition, given the rapid pace of technological change in the motor vehicle industry, the advantages of Mexico's wage gap with respect to the United States and Canada (which is a major source of the country's competitiveness) will dissipate rapidly. Advances and falling costs in robotics could threaten jobs in the industry in the medium term, at least for some of the best paid workers (see box III.1).

Box III.1
Generic robot cost versus average manufacturing labour costs
(Dollars per hour)

Commercialization of industrial robots is on the rise, with the global motor vehicle industry the most intensive user of the technology to the tune of 1,200 robots per 10,000 workers, compared with national averages of 100-200 units per 10,000 workers in Japan, the United States and Germany (IFR, 2016). The use of robots in the automotive industry grew at an annual rate of 20% between 2010 and 2015, representing 38% of the total number of robots sold globally at the end of this period. In this context, Mexico has become an increasingly important emerging market; in 2015, the country doubled its demand to 5,500 units, clearly surpassing the 1,400 units acquired by Brazil that same year.

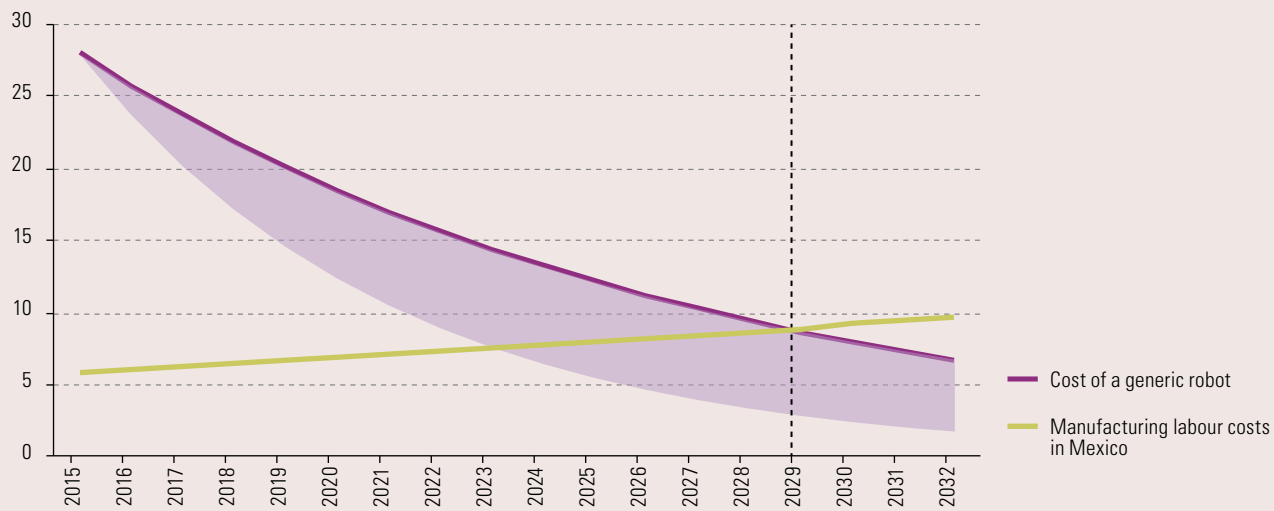
From a labour market perspective, the shift towards robotization has revived past tensions between technological progress and job creation, especially in terms of the threat to jobs posed by automation in the auto sector. Leaving aside the impact of automation per se, the employment issue is especially relevant for Mexico insofar as its lower labour costs have historically been a key differentiating factor in its competitiveness vis-à-vis the United States.

A simulation presented below compares the trajectory of labour costs with that of robot costs for similar tasks. The labour data are based on hourly earnings, including wages and other benefits, while the variables considered for robots are initial investment and maintenance costs. Data on labour costs are plotted according to historical trends, while two scenarios are considered for robots at cost reduction rates of 8% and 15%, on the basis of Sirkin, Zinser and Rose (2014).

The initial hypothesis for the cost of a welding robot —widely used in the automotive industry— was US$ 8 per hour in 2015, rising to US$ 28 per hour for a generic industrial robot. For that same year, manufacturing labour costs per hour in Mexico came in at US$ 5.90 per hour, with a projected annual growth of 3%.

Under these assumptions, cost convergence for the whole of the manufacturing sector would materialize towards the end of the 2020s, a non-trivial finding for many traditional motor vehicle industry suppliers operating in Mexico. However, the timeline is much tighter for carmakers: in the case of welding robots, cost convergence could already be taking place in 2017.

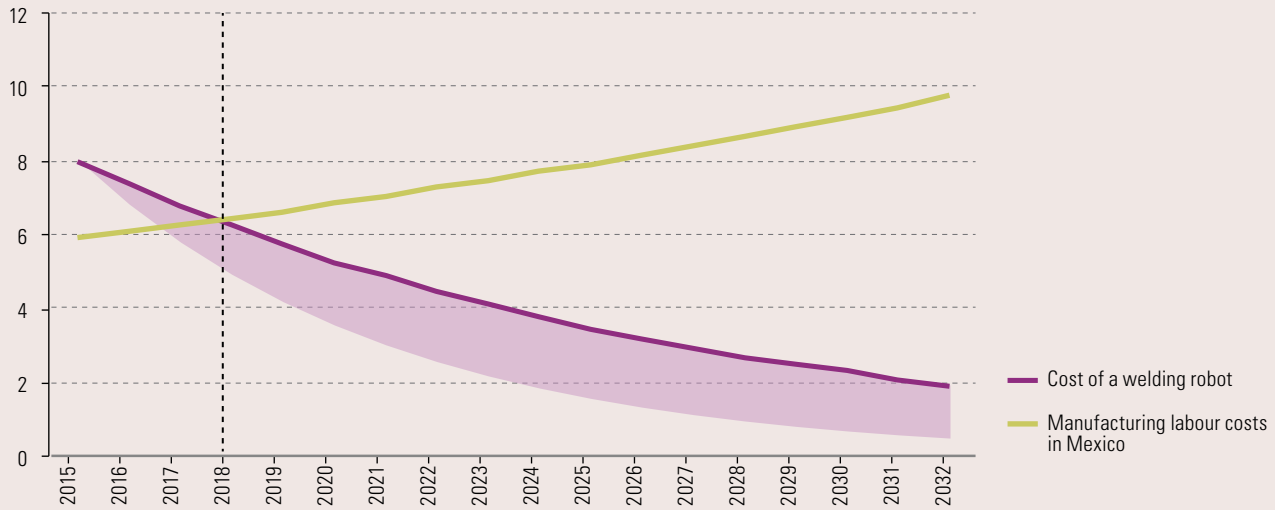
Figure 1
Generic robot cost vs. average manufacturing labour costs
(Dollars per hour)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Sirkin, H., M. Zinser and J. Rose, "The shifting economics of global manufacturing: how cost competitiveness is changing worldwide", The Boston Consulting Group, August 2014 (robot price data), and The Conference Board, "International comparisons of hourly compensation costs in manufacturing, 2015 - Summary tables" [online] https://www.conference-board.org/ilcprogram/index.cfm?id=38269 (labour cost data).

Box III.1 (concluded)

Figure 2
Welding robot cost vs. average manufacturing labour costs
(*Dollars per hour*)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Sirkin, H., M. Zinser and J. Rose, "The shifting economics of global manufacturing: how cost competitiveness is changing worldwide", The Boston Consulting Group, August 2014 (robot price data), and The Conference Board, "International comparisons of hourly compensation costs in manufacturing, 2015 - Summary tables" [online] https://www.conference-board.org/ilcprogram/index.cfm?id=38269 (labour cost data).

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Federation of Robotics (IFR), *World Robotics 2016: Industrial Robots*, September 2016.

2. Changes in United States policy: executive orders and renegotiation of the North American Free Trade Agreement (NAFTA)

Pressures on the automotive industry resulting from recent policy changes by the incoming Administration in the United States revolve around international trade and industrial policy decisions. Even though economic policy issues have always played a key role in presidential campaigns, rarely have trade, investment and fiscal policies been such an important factor in an election, and in global political discourse, as they were in 2016. During the campaign, the new President's economic platform was presented as an alternative to the globalization agenda and included the withdrawal of the United States from the Trans-Pacific Partnership (TPP) and from NAFTA, tariffs of 45% on imports from Mexico, the reduction of the trade deficit and the reform of corporate tax legislation to stimulate the repatriation of companies, jobs and capital. These proposals were grouped under the collective slogan and policy of "America First", which is aimed at repositioning the United States as the main hub of global manufacturing, especially in the automotive industry.

The effects of the new trade and industrial policy discourse began to be felt immediately after the election. In the 10 weeks that elapsed between the election and his inauguration, the President-elect concentrated heavily on the automotive industry and reached a number of agreements with United States manufacturers in the sector to withdraw planned investments in Mexico or commit to reshoring plants and jobs to the United States. For instance, Ford announced that it would cancel its planned investment of US$ 1.6 billion in Mexico and that it would instead invest US$ 700 million in a plant in Michigan to manufacture electric

and autonomous driving vehicles (Welch, 2017). Similarly, soon after the President-elect indicated that General Motors should manufacture its Chevrolet Cruze in the United States or run the risk of paying border taxes, the firm announced that it would invest US$ 1 billion to strengthen its manufacturing capacity in the country and that it would keep 1,500 jobs in the United States (Reuters, 2017b).

On the basis of these initial actions, once the new Administration took office in January 2017, the President signed executive orders on a broad range of issues, in order to create institutions, streamline regulatory process and authorizations, and strengthen mechanisms for boosting manufacturing in the United States (see table III.6).

Table III.6
United States: executive orders, January-June 2017

Topic	Decree	Objective
Institutions	Presidential Executive Order on the establishment of Office of Trade and Manufacturing Policy (OTMP)	To defend and serve United States workers and domestic manufacturers while advising the President on policies to increase economic growth, decrease the trade deficit and strengthen the United States manufacturing and defence industrial bases.
Trade policy	Presidential Memorandum Regarding Withdrawal of the United States from the Trans-Pacific Partnership (TPP) Negotiations and Agreement	To permanently withdraw the United States from TPP negotiations, and to begin pursuing, wherever possible, bilateral trade negotiations to promote United States industry, protect United States workers, and raise United States wages.
	Omnibus Report on Significant Trade Deficits	To address the challenges to economic growth and employment that may arise from large and chronic trade deficits and the unfair and discriminatory trade practices of some of United States trading partners, improve general conditions for free and fair trade and competition and ensure the strengthening of United States manufacturing and defence industrial bases.
Manufacturing	Presidential Executive Order on Buy American and Hire American	To maximize the use of goods, products and materials produced in the United States to promote economic and national security, stimulate economic growth, create good jobs at decent wages, strengthen the middle class and support the American manufacturing and defence industrial bases.
	Presidential Memorandum Streamlining Permitting and Reducing Regulatory Burdens for Domestic Manufacturing	To support the expansion of manufacturing in the United States through expedited reviews of and approvals for proposals to construct or expand manufacturing facilities and through reductions in regulatory burdens affecting domestic manufacturing.
Environment	Presidential Executive Order on Promoting Energy Independence and Economic Growth	To review existing regulations that potentially burden the development or use of domestically produced energy resources and appropriately suspend, revise, or rescind those that unduly burden the development of domestic energy resources.
Infrastructure	Executive Order Expediting Environmental Reviews and Approvals for High Priority Infrastructure Projects	To streamline and expedite environmental reviews and approvals for all infrastructure projects, especially projects that are a high priority for the Nation, such as improving the electric grid and telecommunications systems, and repairing and upgrading critical port facilities.
Enforcement of the law	Presidential Executive Order on Establishing Enhanced Collection and Enforcement of Antidumping and Countervailing Duties and Violations of Trade and Customs Laws	To ensure the timely and efficient enforcement of United States trade laws, including antidumping and countervailing duties, and intellectual property rights.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of The White House, "Executive Orders" [online] https://www.whitehouse.gov/briefing-room/presidential-actions/executive-orders.

Among these new institutions, the Office of Trade and Manufacturing Policy (OTMP) was created to serve domestic workers and manufacturers while advising the President on policies to increase economic growth, decrease the trade deficit and strengthen the country's manufacturing and defence industrial bases.[6] This executive order —together with those addressing preferential treatment for United States products and workers ("buy American, hire American"), the reduction of regulatory and financial burdens on building and expanding manufacturing plants and the construction of infrastructure to support domestic and global trade— aims to strengthen and prioritize the country's industrial capabilities, including the motor vehicle industry.[7]

[6] See The White House, "Presidential Executive Order on Establishment of Office of Trade and Manufacturing Policy" [online] https://www.whitehouse.gov/the-press-office/2017/05/01/presidential-executive-order-establishment-office-trade-and.]

[7] Even though the Office of Trade and Manufacturing Policy (OTMP) and the policy of preferential treatment for products and workers of the United States ("buy American, hire American") are new and were warmly received by the automotive industry, other governments have also embarked on these types of policies before; for example, the Obama Administration created the White House Office of Manufacturing Policy, as well as a national network of technological centres known as Manufacturing USA to boost innovation in the manufacturing sector.

The Administration also began to review environmental regulations affecting the motor vehicle industry, including the Corporate Average Fuel Economy (CAFE) Standards —recently strengthened by the Environmental Protection Agency (EPA) in order to reach energy efficiency levels of 54.5 miles per gallon by 2025— which the outgoing Administration had designed as part of efforts to combat climate change and drive the development of hybrid and electric vehicles. Carmakers were largely in favour of the new executive order as complying with new standards could have cost up to US$ 33 billion (*Financial Times*, 2017).

After this first raft of reforms and deregulation, the Administration shifted its attention to NAFTA. Although it was initially thought that the United States would withdraw from the agreement, on 18 May 2017 the Administration asked Congress to approve the start of NAFTA update talks with Mexico and Canada after a 90-day period. The idea is apparently to modernize the agreement's provisions on intellectual property rights, regulatory practices, public enterprises, e-commerce, services, customs procedures, sanitary and phytosanitary measures, employment, the environment and small and medium-sized enterprises.

Despite the absence, at June 2017, of detailed information on the scope of negotiations, NAFTA renegotiation discussions will probably revolve around the same issues addressed in the withdrawal from TPP. Also, negotiations should be consistent with the priorities and objectives established by the Bipartisan Congressional Trade Priorities and Accountability Act of 2015, which include boosting liberalization by all possible means, supporting global value chains and robust labour and environmental regulations, and ensuring that World Trade Organization (WTO) disciplines are enforced in the context of the traditional and digital trade in goods and services.

Both Mexico and Canada have given their support for updating NAFTA, which was adopted 23 years ago, and they have indicated a desire to preserve the regional automotive production chains. Although the United States has to date emphasized regulatory issues, negotiations on tariffs and rules of origin will be crucial in reaching a new agreement. Under NAFTA, all automotive import duties were waived as long as rules of origin were met: a regional content value of 62.5% for automobiles, light trucks, engines and transmissions, and of 60% for other types of vehicles and parts. In this framework, any major changes to the existing trade preferences could significantly upset production and supplier chains in North America.

Although it is too soon to gauge the effect of these new policies —many of which have yet to be implemented— and the scope of the NAFTA negotiations is not fully clear, any change in automotive production chains would be highly damaging to jobs and competitiveness. In such a scenario, China could see a strengthening of its dominant role as a producer of parts, components and specialized machinery, given the sheer size and low costs of its motor vehicle industry (CAR, 2017b).

At this juncture of pressures from the technological revolution combined with the shifting focus of trade and industrial policies in the United States, Mexico's automotive industry enjoys a strong position. However, this will not shield it from significant challenges to its status as one of the world's largest producers and exporters. Beyond the trade negotiations currently under way, Mexico will have to base its responses on new sectoral and technology policy efforts, framed by the current reality of the global automotive industry.

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