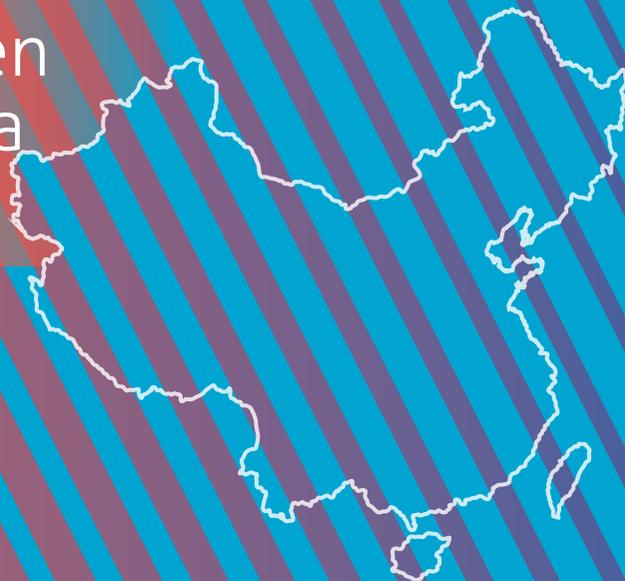


Exploring new forms of cooperation between China and Latin America and the Caribbean



Second Ministerial Meeting
of the Forum of **China** and the
Community of Latin American
and Caribbean States (**CELAC**)



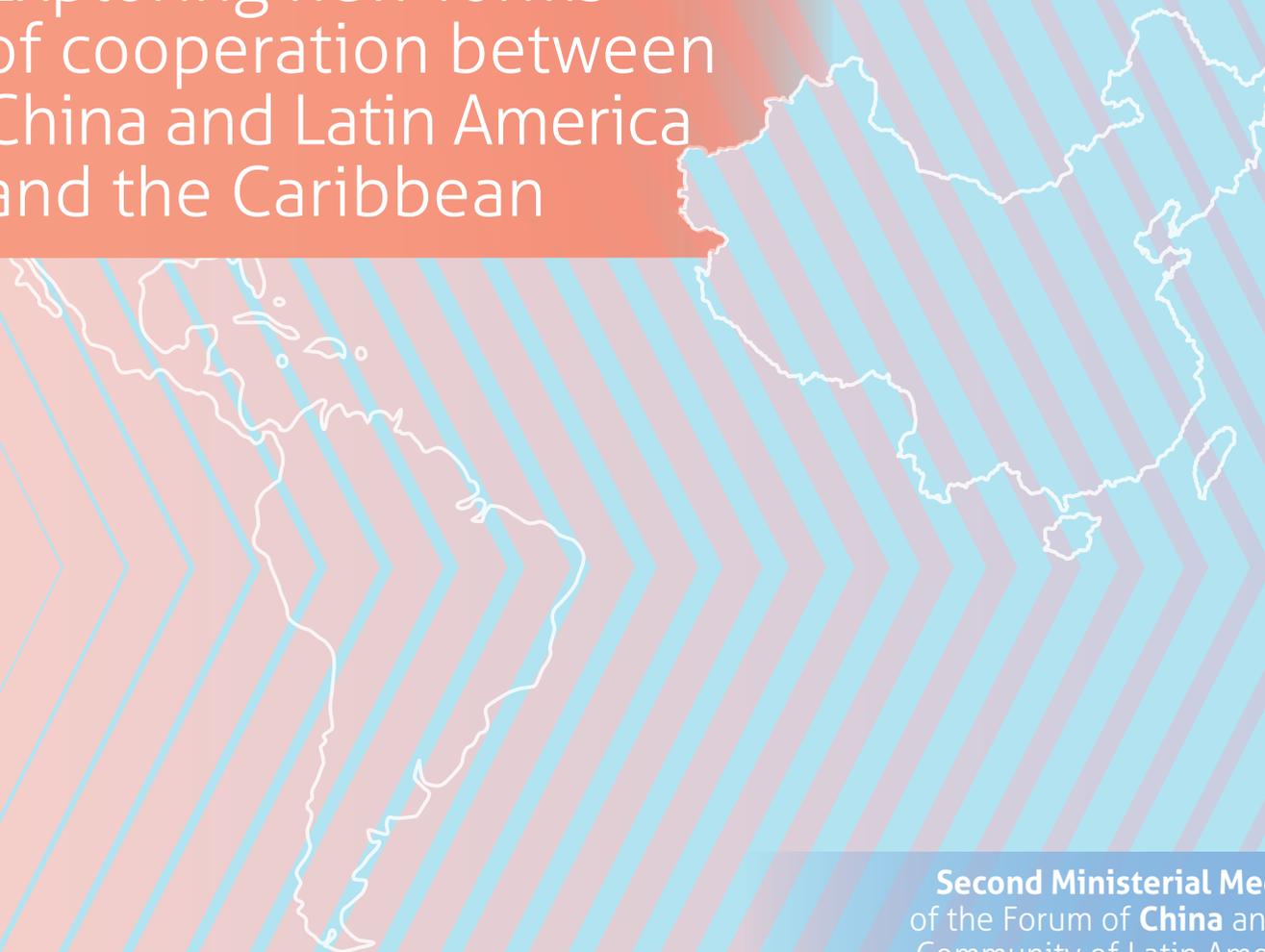
UNITED NATIONS

ECLAC



FOR SUSTAINABLE
DEVELOPMENT WITH EQUALITY

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FOR SUSTAINABLE
DEVELOPMENT WITH EQUALITY

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Executive Secretary

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This document was prepared by the Economic Commission for Latin America and the Caribbean (ECLAC) for the Second Ministerial Meeting of the Forum of China and the Community of Latin American and Caribbean States (CELAC), which will be held in Santiago on 22 January 2018.

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The opinions expressed in this document do not necessarily reflect any official position of CELAC or of the Government of China.

The boundaries and names shown on the maps in this document do not imply official endorsement or acceptance by the United Nations.

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Foreword

This document is a contribution by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) to the discussions of the Second Ministerial Meeting of the Forum of China and the Community of Latin America and Caribbean States (CELAC), which is to take place in Santiago on 22 January 2018. It is based on the main topics addressed at the First CELAC-China High-level Academic Forum, held on 17 and 18 October 2017 at ECLAC headquarters in Santiago. On that occasion, academic delegations from the CELAC nations and China discussed a wide range of issues, including trade, financial and investment relations between the region and China, the Belt and Road Initiative and prospects for bilateral cooperation in the fields of science, technology and innovation.

The Second Ministerial Meeting of the Forum of China and the Community of Latin America and Caribbean States (CELAC) will take place at a time when humanity is facing grave challenges —poverty, inequality and mass migrations, together with environmental crises, climate change and the still uncertain impact of the digital revolution— in a context of pronounced uncertainty about the future of multilateral cooperation on various levels. Against that backdrop of rising tension and rapid change, China has expressed a strong commitment towards a model for economic growth based on equality, the protection of the environment, multilateralism, shared prosperity and the principles of the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals. That stance was underscored by President Xi Jinping in his speech at the 19th National Congress of the Communist Party of China and during his most recent visit to ECLAC headquarters in November 2016. The region and China share common views on those issues, and that provides a solid foundation on which to build our bilateral cooperation over the coming years.

The Second Ministerial Meeting of the Forum of China and the Community of Latin America and Caribbean States (CELAC) offers a propitious opportunity to strengthen the many different ties that exist between Latin America and the Caribbean and China, in order to further the inclusive and sustainable development of both. In that context, ECLAC reaffirms its firm commitment to support the creation of new models for cooperation between the region and China in the twenty-first century.

This publication's seven chapters are intended to cover the key issues in the relationship between Latin America and the Caribbean and China. The first chapter analyses the current international economic situation, which is seeing a recovery in growth but is also marked by uncertainties regarding macroeconomics, technology and the governance of globalization. It notes that the Chinese economy remains buoyant at a time of far-reaching reforms, while our region is experiencing a modest recovery of economic activity. Chapter two analyses the social context in the region and in China

and the common challenges facing both in areas such as eradicating poverty and making progress with education and health. The third chapter provides an overview of our bilateral trade and notes that the diversification of the region's export basket to China is still the main challenge it faces. The fourth chapter highlights the opportunities that exist for building a renewed relationship in the area of foreign direct investment (FDI). In 2016, while China became the world's second largest foreign investor, FDI flows to Latin America and the Caribbean fell for the second year running. A major realignment of that relationship would be possible if both sides develop strategies that simultaneously expand and diversify the sectors in the region that receive Chinese investment.

Chapter five makes the point that the region's levels of infrastructure investment remain inadequate and that China could make a major contribution towards reducing the shortfall. It also examines the shared challenge of climate change and the mitigation commitments that both sides have assumed. The sixth chapter provides a comparison of the region and China in terms of their policies for research and development, human resource training and the fourth industrial revolution. Finally, in chapter seven, some proposals are made for furthering different forms of cooperation between Latin America and the Caribbean and China.

Alicia Bárcena
Executive Secretary
Economic Commission for Latin America
and the Caribbean (ECLAC)

I. The economies of China and Latin America and the Caribbean in an uncertain global context

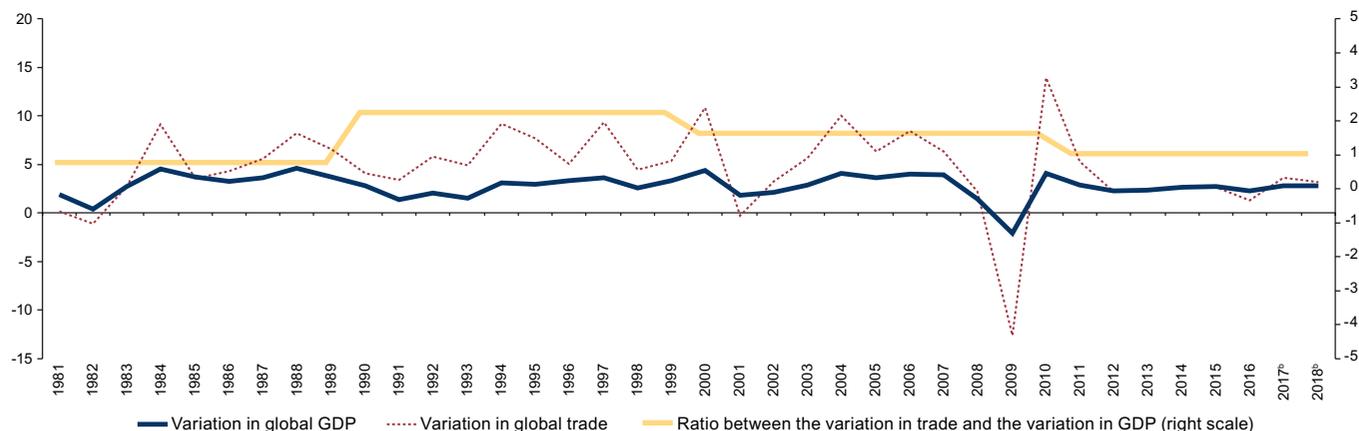
A. The international context: recovery, but uncertainty remains

1. A slight upturn in global output and trade

- The global economy recovered slightly in 2017, a trend that is expected to continue in 2018 on the back of greater momentum in investment, industrial production and trade. This increased activity also led to greater levels of consumer and business confidence. However, the recovery has not occurred across the board. Sub-Saharan Africa, the Middle East, and Latin America and the Caribbean have recorded low levels of growth. Furthermore, various sources of uncertainty (as described below) could hinder the global economy's growth potential in the medium term.
- Global trade in goods also recovered in 2017 and grew 3.6%, with expectations of 3.2% growth in 2018. These rates, however, are much lower than those experienced during the expansion of world trade before the global financial crisis of 2008 and 2009. While trade grew at an annual average rate of 6.3% between 2000 and 2007, it dropped to 2.2% per annum between 2012 and 2016, and over the latter year recorded a sluggish 1.3%. Consequently, whereas trade grew on average 1.7 times faster than global GDP during the first period, both variables converged around a similar growth rate between 2012 and 2016.

■ Figure I.1 ■

Annual variation in the volume of global trade in goods and in global GDP, and ratio between both variations, 1981-2018^a
(Percentages and multiples)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Trade Organization (WTO), *World Trade Statistical Review 2017*, Geneva, 2017, and "WTO upgrades forecast for 2017 as trade rebounds strongly," Geneva, 21 September 2017 [online] https://www.wto.org/english/news_e/pres17_e/pr800_e.htm.

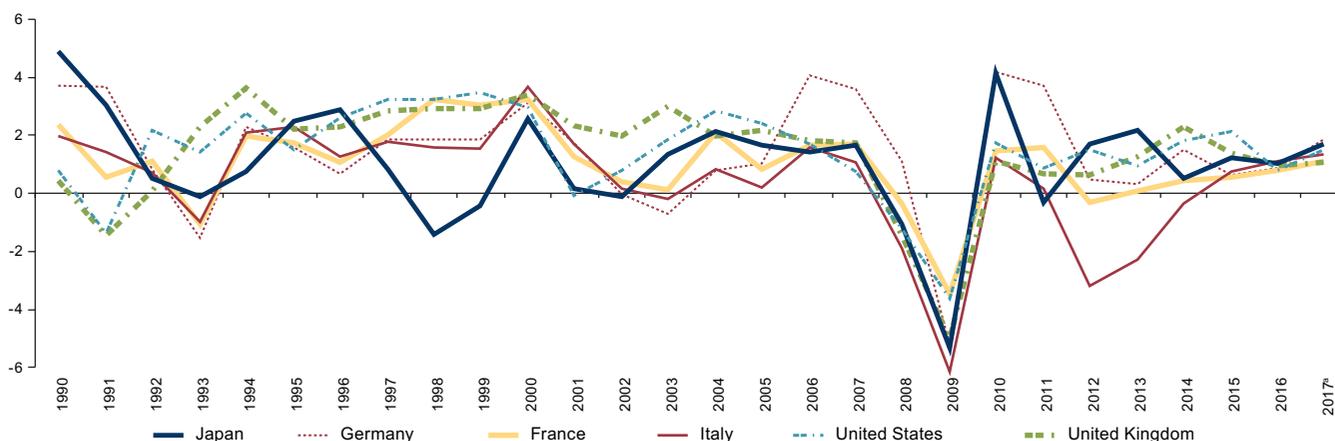
^a Global trade corresponds to the average of exports and imports. Ratios between the variation in trade and the variation in GDP refer to the averages for each decade.

^b Figures for 2017 and 2018 are projections.

2. Developed economies resume growth, but investment remains low

- In 2017, the economies of the eurozone grew in concert and faster than expected, mainly on account of investment and private consumption. For the first time since the 2008/2009 crisis, the labour market is experiencing positive momentum, with higher employment levels and reduced unemployment rates. However, the uncertainty resulting from the Brexit negotiations raises questions about this recovery.
- In the United States, the economic expansion has been boosted by larger-than-expected investment levels. While employment continues to grow and the unemployment rate remains around 4%, wages are reporting a weak recovery.
- The Japanese economy also showed renewed activity levels, owing to a rise in investment and a greater demand for its exports, especially from the rest of Asia.
- However, the major economies are reporting significant decelerations in per capita GDP growth compared to historical trends.
- At the same time, investment levels are still below pre-crisis levels in most of the major developed economies. Productive capital has grown slowly, thus resulting in productivity growing at rates below the average levels of the past two decades.

■ **Figure I.2** ■
Selected advanced economies: per capita GDP growth, 1990-2017^a
(Percentages)

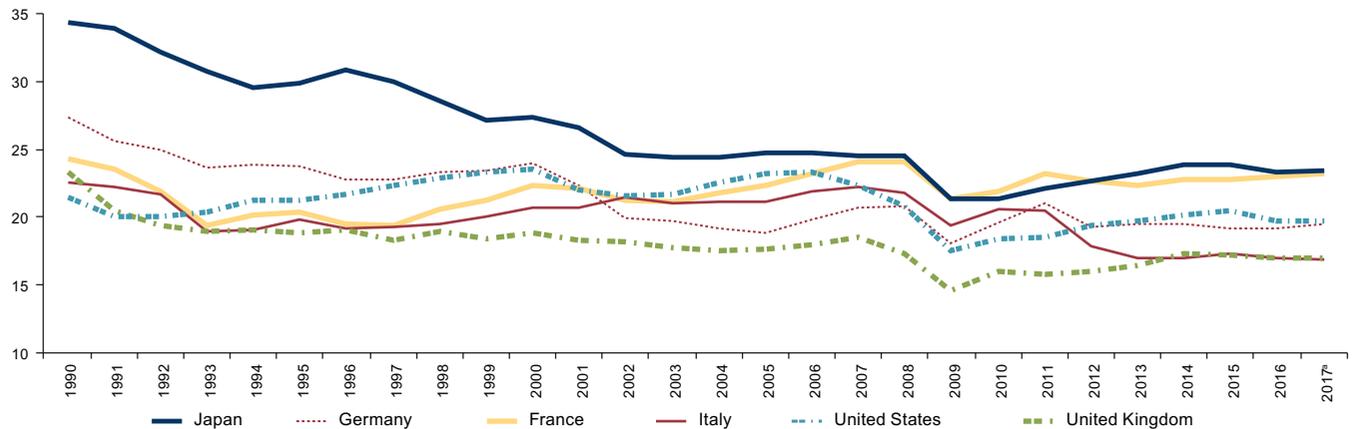


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Monetary Fund (IMF), World Economic Outlook (WEO) database, October 2017.
^a Figures for 2017 are projections.

■ **Figure I.3** ■

Selected advanced economies: investment as a share of GDP, 1990-2017

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Monetary Fund (IMF), World Economic Outlook (WEO) database, October 2017.
^a Figures for 2017 are projections.

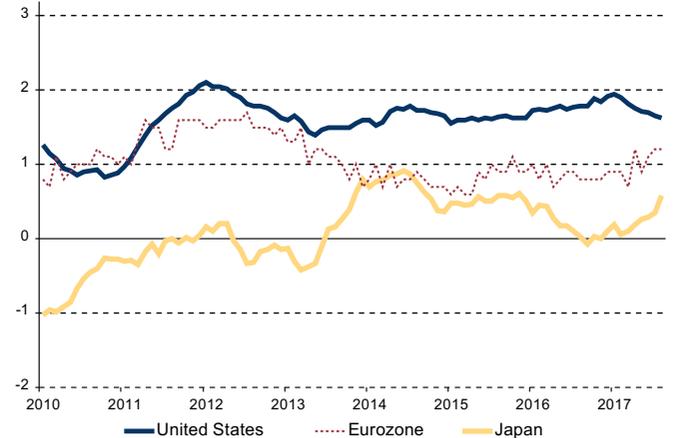
3. Doubts arise about the dominant macroeconomic model

- Despite low unemployment levels and economic growth, especially in Japan and the United States, inflation has not reacted as expected. This suggests a weakening in the relationship between these variables and raises doubts on the validity of certain traditional economic models.
- These countries' macroeconomic authorities interpret the low responsiveness of inflation to labour market dynamics and economic growth as a temporary phenomenon and expect a return to the normal situation.
- Another view maintains that the forces involved are more structural and long-term, and that economic and monetary policy instruments should take those forces and their effects on board in order to restore predictability. These forces include globalization and the technological revolution, which could have affected the determination of wages and prices.

■ **Figure I.4** ■

United States, Japan and eurozone: monthly variation in core inflation compared with the same month the previous year, 2010-2017^a

(Percentages)



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

^a Inflation for the United States on the basis of the personal consumption expenditures (PCE) price index of the Federal Reserve's economic data; for the eurozone, on the basis of the Eurostat harmonized index of consumer prices (HICP); and for Japan, on the basis of the Bank of Japan's consumer price index (CPI), excluding the impact of changes in the consumption tax.

4. The impact of robotization and the digital revolution on employment

- The development of new technologies has accelerated and their impact has expanded across the economy and society. This can be seen in the exponential growth, since 2007, in the installed capacity for broadband cross-border flows. In the last two years, new fields of action have opened up in the areas of robotics and artificial intelligence which have now become commonplace in policy discussions on account of their potential impact. These technological advances have radical effects on business structures.
- New technologies, especially robotics and artificial intelligence, have multiple effects, but their impact on the level and quality of employment is probably the most important for policymaking, and possibly also the most uncertain. Estimates made from 2013 onwards reach very different conclusions. However, most studies point to negative effects, especially in contexts characterized by slow employment growth or a rapidly expanding working-age population.

■ Box I.1 ■

Expected impacts of automation in employment

Recent studies into the impact of new technologies on employment contain a set of pessimistic forecasts made by various authors.

Frey and Osborne (2013)

47% of jobs in the United States face a serious threat of automation.

Citigroup/Oxford University (2016)

57% of jobs in the countries of the Organization for Economic Cooperation and Development (OECD) are susceptible to automation.

World Economic Forum (2016)

5.1 million jobs could be lost in 15 large economies between 2015 and 2020, as a result of a net loss of 7.1 million jobs and a gross creation of 2 million jobs.

McKinsey Global Institute (2017)

60% of occupations have at least 30% of their activities that are automatable.

Acemoglu and Restrepo (2017)

Estimates suggest that one extra robot per 1,000 workers reduced the employment to population ratio by between 0.18 and 0.34 percentage points, and salaries by between 0.25% and 0.5%.

Other authors, however, reach more optimistic conclusions and estimates on the relationship between automation and employment:

Graetz and Michaels (2015)

An analysis of 17 countries for the 1993–2007 period showed that the introduction of robots did not translate into a reduction of either salaries or employment.

Arntz, Gregory and Zierahn (2016)

Only 9% of jobs in 21 OECD countries could be automated.

Gregory, Salomons and Zierahn (2016)

The technical changes that led to substitutions in routine work had a positive net impact on total employment for a sample of 27 countries between 1999 and 2010, as positive externalities prevailed over the substitution of labour by capital.

Source: McKinsey Global Institute, *A Future that Works: Automation, Employment, and Productivity*, January 2017; C. Frey and M. Osborne, "The future of employment: how susceptible are jobs to computerisation?"; *Working Paper*, Oxford, Oxford University, 17 September 2013; Citigroup/University of Oxford, *Technology at Work v2.0: the future is not what it used to be*, Oxford, January 2016; M. Arntz, T. Gregory and U. Zierahn, "The risk of automation for jobs in OECD countries: A comparative analysis"; *OECD Social, Employment and Migration Working Paper*, No. 189, Paris, May 2016; World Economic Forum, "The future of jobs: employment, skills, and workforce strategy for the fourth industrial revolution"; *Global Challenge Insight Report*, Cologne, January 2016; T. Gregory, A. Salomons and U. Zierahn, "Racing with or against the machine? Evidence from Europe"; *Discussion Paper*, No. 16-053, Mannheim, Centre for European Economic Research, 2016; G. Graetz and G. Michaels, "Robots at work"; *CEP Discussion Paper*, No. 1335, Centre for Economic Performance (CEP), 2015; D. Acemoglu and P. Restrepo, "Robots and jobs: evidence from US labor markets"; *NBER Working Paper*, No. 23285, National Bureau of Economic Research, March 2017.

5. Tensions rise in the governance of global trade

- Uncertainty regarding the governance of global trade, which was already undergoing a redefinition process, increased after Donald Trump took office as President of the United States. The country's new trade policy, under the "America First" slogan, is characterized by openly protectionist rhetoric, a shift from multilateralism to bilateralism, a focus on reducing trade deficits and efforts to bring about the reshoring of industries and jobs.
- Against this backdrop, the incoming Government withdrew the United States from the Trans-Pacific Partnership (TPP) and from the Trade in Services Agreement (TISA). Additionally, it has openly criticized the World Trade Organization (WTO) and began negotiations to modernize the North American Free Trade Agreement (NAFTA). It has also intimated that the agreements with Chile, Colombia, Panama, Peru, the Central American countries and the Dominican Republic could be renegotiated once the NAFTA negotiations are concluded.

■ Table I.1 ■

United States: the shift from multilateralism to bilateralism, 2017

Action	Implications
Withdrawal from the Trans-Pacific Partnership (TPP)	<ul style="list-style-type: none"> - Possible bilateral agreements with Japan and other partners in Asia - Certain elements of TPP (for example, those referring to digital commerce) could be reinstated in the renegotiation of the North American Free Trade Agreement (NAFTA)
Renegotiation of the North American Free Trade Agreement (NAFTA)	<ul style="list-style-type: none"> - A new NAFTA, with better terms for the United States - Possible renegotiation of agreements with other Latin American countries
Suspension of the Transatlantic Trade and Investment Partnership (TTIP)	<ul style="list-style-type: none"> - Possible bilateral agreements with the United Kingdom
World Trade Organization (WTO) and multilateral system called into question	<ul style="list-style-type: none"> - Greater autonomy to develop and implement national legislation in trade and fiscal

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

B. China in the global economy

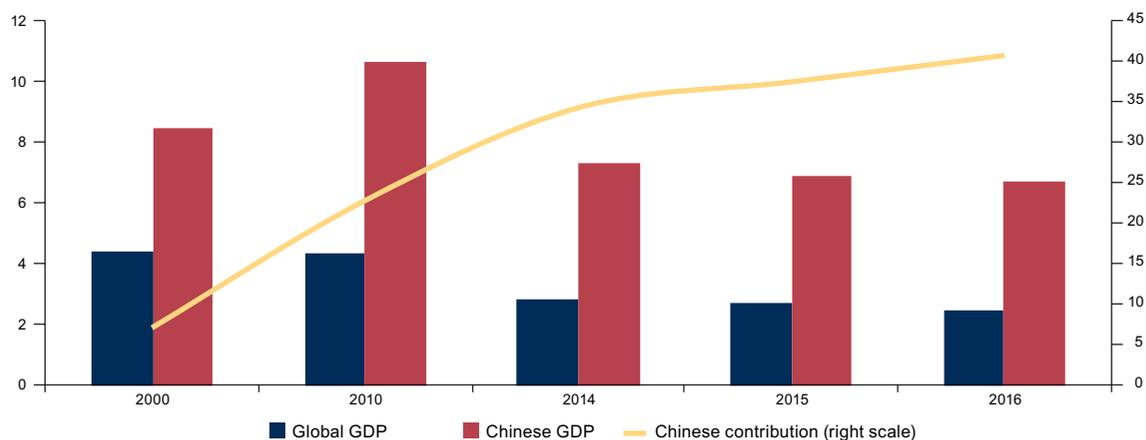
1. China has contributed significantly to the expansion of the global economy

- China has been one of the most important engines of global GDP growth, and its contribution has been even more noticeable in the aftermath of the global financial crisis.
- In 2000, China grew at an annual rate of 8.5% and accounted for close to 3.6% of global GDP, thus contributing close to 0.3 percentage points to global growth. In 2010, China's economy grew at an annual rate of 10.6% and represented close to 9.2% of global GDP. Since 2010, the country has contributed almost 1 percentage point a year to the global GDP growth rate and, in 2016, accounted for more than 40% of the expansion.
- In 2016, the Chinese economy accounted for more than 15% of global GDP and was the world's second largest economy after that of the United States. It has the world's largest industrial GDP, insofar as it represents 22.5% of this global metric. Similarly, it is the largest agricultural producer in the world, accounting for 30% of the aggregate value of global agricultural activity.
- The country is the second largest economy in terms of household end consumption (9.6% share), behind only the United States, which accounted for 28.9% of global consumption in 2016.

■ Figure I.5 ■

Chinese and global GDP annual growth rates, and China's contribution to global growth

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, World Development Indicators (WDI).

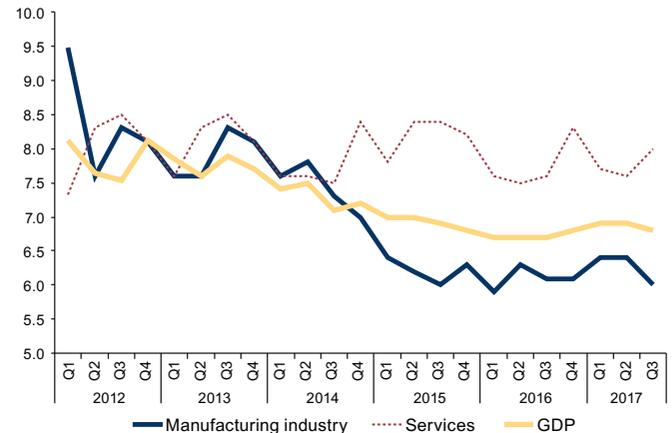
2. The Chinese economy continues growing at a fast rate, but its composition has changed

- Chinese economic growth is stabilizing between 6.4% and 6.7% for the 2016–2018 period. Despite this growth rate being lower than the two-digit level recorded by the country after the global financial crisis, it nonetheless remains one of the highest in the world.
- Furthermore, the Chinese economy continues its transition from an investment and manufacturing paradigm to a new model based on consumption and services.
- This greater momentum in the services sector is in part attributable to the growth of consumption—which is more service intensive—outstripping that of gross fixed capital formation. Lower investment levels are partially a consequence of the decline in construction, especially in small and medium-sized cities, but these levels are still much higher than those of investment in other economies.

■ **Figure I.6** ■

China: year-on-year growth in GDP, industry and services, first quarter 2012 to third quarter 2017

(Percentages)



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

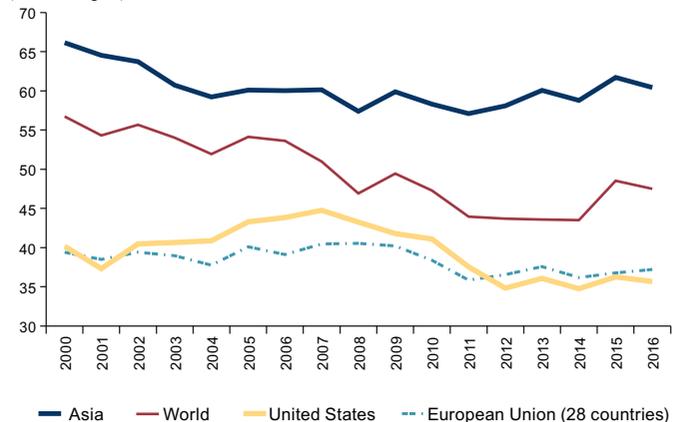
3. China shortens its value chains

- Today China produces many inputs that it previously had to import, as can be seen in the fall of 9 percentage points (from 57% to 48%) in the share of parts and components in its non-oil imports since 2000.
- Over the past few decades, China has been transforming its manufacturing sector, evolving towards industries with a growing technological and knowledge-based content. Today it is the world's largest producer of steel and many other industrial products, such as automobiles.
- At the same time, the country is increasingly using domestic output to substitute its imports of high-tech and knowledge-based parts and components. This trend is driven by a range of policies that constitute the Made in China 2025 plan, which was launched in 2015 and which has, as one of the objectives, raising the domestic content of components and materials to 40% in 2020 and 70% in 2025.

■ **Figure I.7** ■

China: share of parts and components in total imports (excluding oil) from the rest of the world and selected partners, 2000–2016

(Percentages)

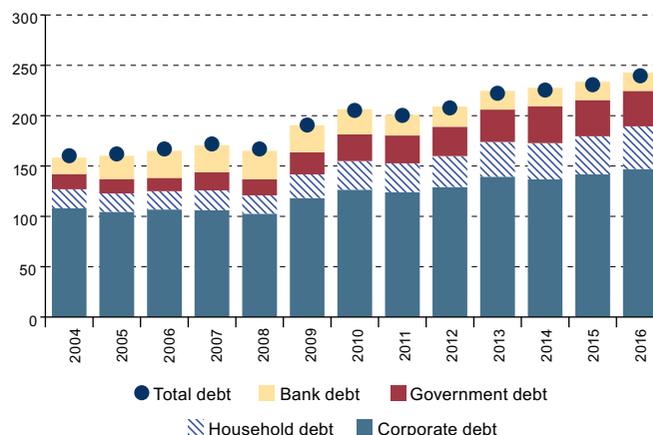


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from United Nations Commodity Trade Statistics Database (COMTRADE).

4. Growing public and private debt in China could put a brake on the economy

- The dynamics of the Chinese economy could be affected by rising business loan defaults. That risk is growing on account of increased leverage and the rise in corporate debt as a percentage of GDP. Taking other types of debt into consideration, the total indebtedness of the Chinese economy reached nearly 250% of GDP in 2016, compared to 165% immediately prior to the global financial crisis.
- Corporate debt in China is particularly high compared to Organization for Economic Cooperation and Development (OECD) countries and other emerging economies. The increased indebtedness is largely concentrated among state-owned enterprises. At the same time, non-performing and problem loans are growing, as are defaults in the corporate bond market. A sharp uptick in defaults could trigger a deleveraging by banks and significant interest rate hikes, which would adversely affect private investment.

■ **Figure I.8** ■
China: debt levels, by type, 2004-2016
 (Percentages of GDP)



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

5. The Belt and Road Initiative is an expression of China's growing global role

- In 2013, President Xi Jinping announced the Belt and Road Initiative, a large-scale infrastructure project to connect Asia, Europe and Africa and bolster economic growth and international cooperation.
- The Belt and Road Initiative has two main components: the Silk Road Economic Belt, a land corridor, and the 21st Century Maritime Silk Road, a sea route. The initiative entails the construction of roads, rail lines, pipelines and ports. In addition, air routes will be created and cooperation in the areas of the digital economy, artificial intelligence, cloud computing and smart cities will be fostered to create a Digital Silk Road.
- The Belt and Road Initiative will be financed by the Silk Road Fund, with support from the China Development Bank,

the Export-Import Bank of China, the Asian Infrastructure Investment Bank, the New Development Bank of the BRICS countries (Brazil, the Russian Federation, India, China and South Africa) and other institutions. Total funding for the Belt and Road Initiative could amount to a trillion dollars. The Government of China has announced several types of financial support, including an increase of US\$ 14.5 billion for the Silk Road Fund, development aid in the amount of 60 billion yuan (US\$ 8.7 billion) for the countries involved in the construction of the initiative over the next three years, US\$ 300 million for emergency food programmes in the participating countries and US\$ 145 million in South-South cooperation subsidies.

■ Map I.1 ■

Land and sea routes of the Belt and Road Initiative



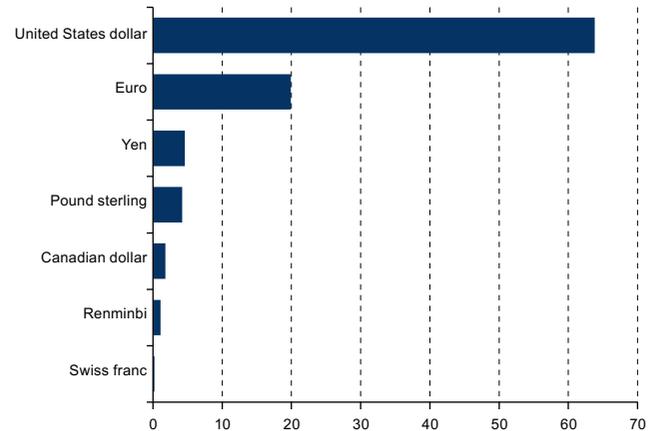
Source: McKinsey and Company, “One Belt and One Road: Connecting China and the world” [online] <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/one-belt-and-one-road-connecting-china-and-the-world>.

6. The renminbi has become a key asset on international financial markets

- The renminbi is growing in importance as a reserve currency. On 1 October 2016, the International Monetary Fund included the renminbi among its special drawing rights basket currencies; as a result, it can now be used as one of the currencies for loans.
- China’s central bank recently announced that more than 60 countries and regions include renminbi holdings in their international reserves. For example, the European Central Bank has invested the equivalent of 500 million euros of its reserves in renminbi. In the region, several countries have announced the inclusion of the renminbi in their reserve currency portfolios. Similarly, the renminbi has been included in the sovereign fund portfolios of various countries.
- China is also a supplier of liquidity in financial markets. Since 2008, China’s central bank has signed at least 30 currency swap agreements with different central banks, for a total of more than US\$ 474 billion. The recipients include Argentina, Brazil, Chile and Suriname. These agreements have been used to promote bilateral trade and to strengthen reserve positions (see section D).

■ Figure I.9 ■

World: currency composition of official foreign exchange reserves, second quarter of 2017
(Percentages)



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

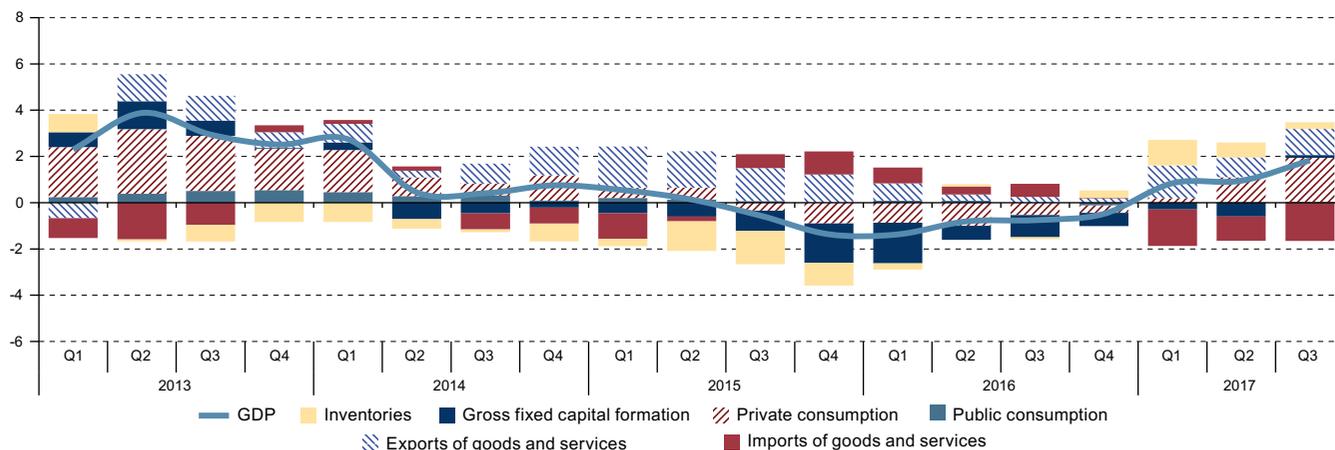
C. Recent performance of the economies of Latin America and the Caribbean

1. The region's economy is growing for the third consecutive quarter, after two years of contraction

- Economic activity in Latin America and the Caribbean is expanding, driven by private consumption and exports: growth was 1.3% in 2017 and is expected to reach 2.2% in 2018, and domestic demand rose by 1.5% over the first three quarters of 2017. This is the result of increased investment (up 2.3%) and of expanding private consumption (up 1.7%), together with, albeit to a lesser extent, an uptick in public consumption, which rose by 0.1%.
- The trade balance improved in 2017, owing to the fact that exports grew faster than imports, largely as a result of higher commodity prices. Export growth of 11% over the 2016 result is expected, on the back of an 8% rise in prices and a 3% increase in volume; imports also stand to rise 8% over their 2016 levels, thanks to a 4% rise in prices and a 4% rise in import volumes. Because of this performance, the region's terms of trade improved by 3% in 2017.
- Unemployment rose from 8.9% to 9.4% between 2016 and 2017, on account of rising participation rates and stagnated employment rates. The unemployment rate is expected to fall to 9.2% in 2018, as increased aggregate demand fuels higher employment.

■ Figure I.10 ■

Latin America: GDP growth rates and contribution by expenditure components to growth, first quarter of 2013-third quarter of 2017
(Percentages)



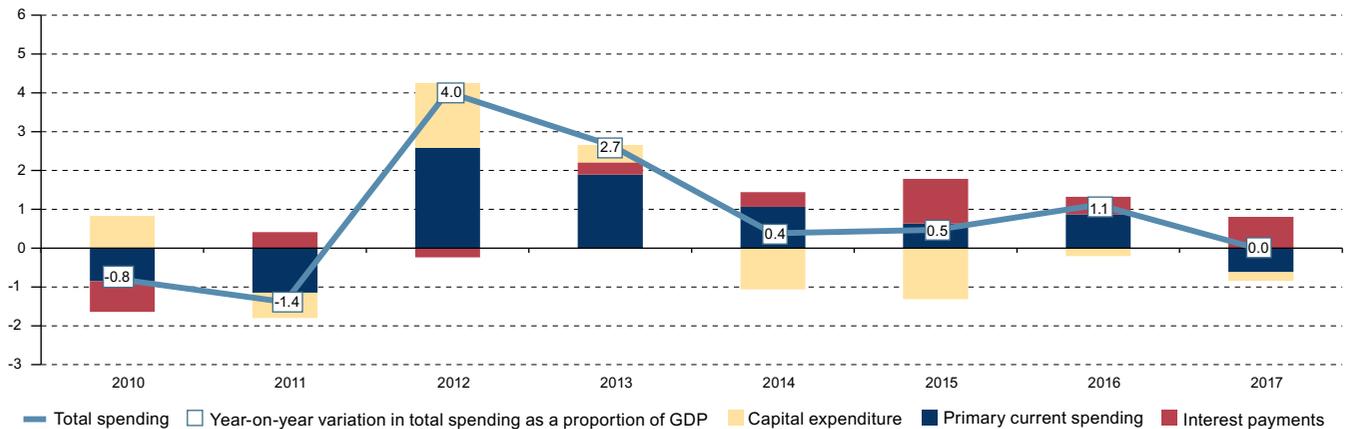
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures.

2. Fiscal consolidation continued to set the tenor of fiscal policy in the region in 2017

- The persistence of public-sector deficits has put greater pressure on the region's governments to adopt fiscal consolidation measures. In particular, the deterioration of primary balances between 2013 and 2016 in South America and in some of the Central American countries has brought the issue of public debt sustainability to the fore. Reflecting that intention, there has been a slowdown in Latin America's public spending growth rate.
- The improvement in primary deficits recorded between 2016 and 2017, together with the uptick in economic activity, led to a slowdown in the growth rate of public debt in Latin America over the past year. In the third quarter of 2017, Latin America's gross public debt amounted to 38.4% of GDP, which was similar to the level recorded at the close of 2016. This indicates a significant shift in the evolution of public debt, which increased by about 10 percentage points of GDP between 2011 (28.8% of GDP) and 2017 (38.4% of GDP).

■ Figure I.11 ■

Latin America (17 countries): contribution of public spending components to year-on-year change in total spending as a proportion of GDP, 2010-2017^a
(Percentages)



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

^a The figures refer to the central Government. They indicate annual change in the average value of the variables in terms of GDP in the countries for which information is available: Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru and Uruguay.

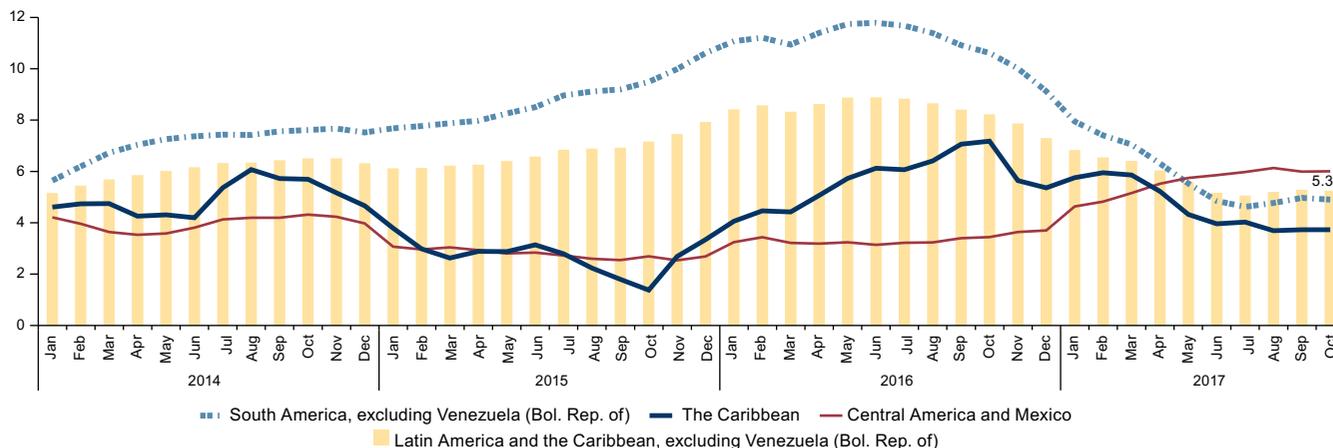
3. Greater nominal stability in the region as a whole has shaped monetary policy

- Inflation in the region has fallen. During the first 10 months of 2017, average inflation in Latin America and the Caribbean continued the downward trend that started in mid-2016, falling by 2.9 percentage points year-on-year (from 8.2% at October 2016 to 5.3% at October 2017). Inflation dynamics vary within the region, with decreases in South America and the Caribbean and increases in Central America and Mexico. Although different factors contributed to these subregional disparities, exchange-rate dynamics and anti-inflationary monetary policies were certainly the most significant. In the economies of South America, currency appreciation favoured falling prices.
- In Central America and Mexico, depreciating currencies contributed to rising inflation.
- The region's currencies were more stable in 2017 than in 2016. Increased financial flows and lower risk perceptions have helped reduce currency volatility. At the same time, international reserves continue to rise: an accumulation of US\$ 34.671 billion over the year yielded a 4.2% increase over the total reserves posted at the close of 2016.
- Changes in inflation and exchange rate volatility determined the margins for monetary policy, allowing monetary policy reference rates to be held stable or to be cut in the south of the region while they rose in Central America and Mexico.

■ Figure I.12 ■

Latin America and the Caribbean: consumer price index (CPI), weighted average 12-month rates of variation, January 2014–October 2017

(Base year: 2005=100)



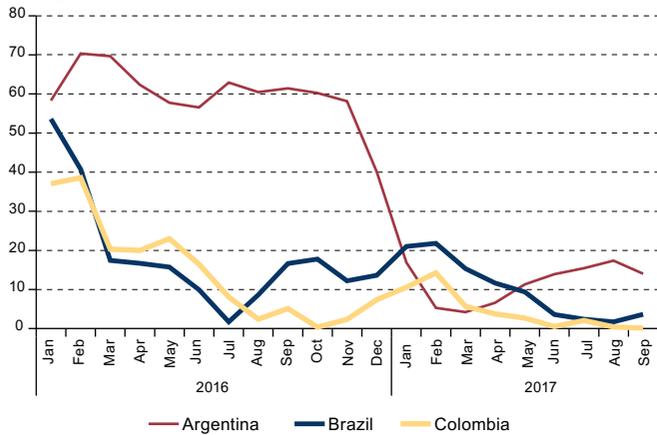
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures.

■ Figure I.13 ■

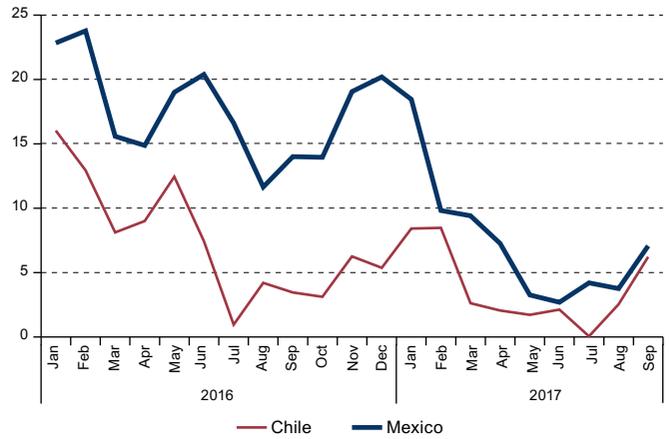
Latin America (selected countries): year-on-year changes in exchange rates, absolute terms, January 2016-September 2017

(Percentages)

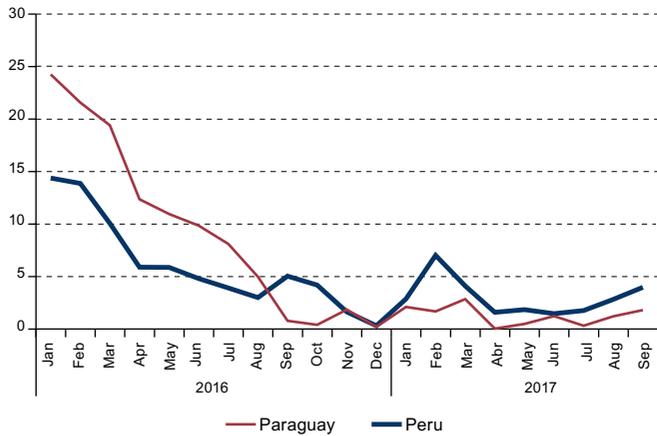
A. Argentina, Brazil and Colombia



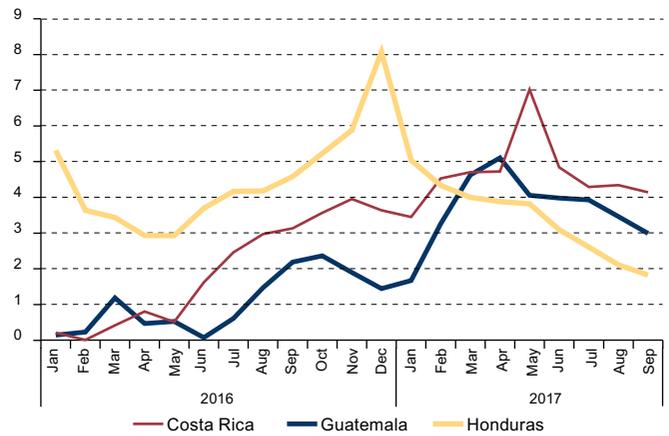
B. Chile and Mexico



C. Paraguay and Peru



D. Costa Rica, Guatemala and Honduras



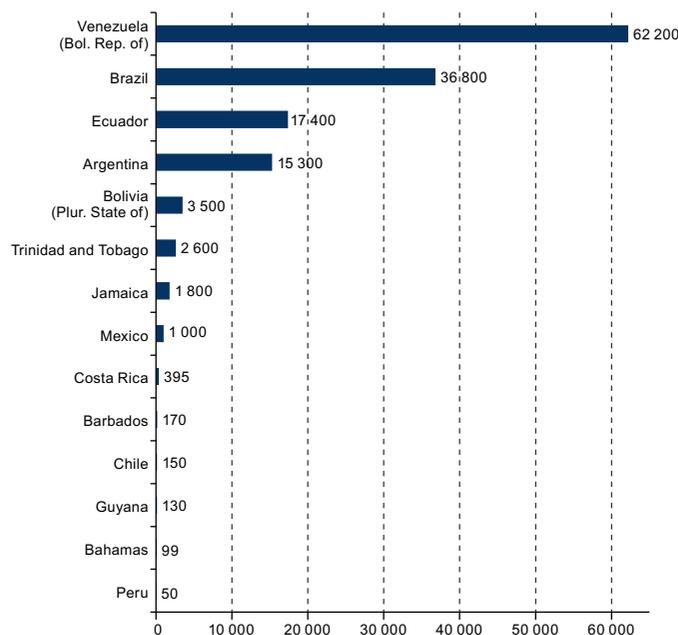
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures.

D. China's role in financing the economies of Latin America and the Caribbean

1. China is playing a rising role in financing the region's economies

- Although the official information available from the Chinese development banks is not sufficiently detailed to provide a case-by-case breakdown of the funding given to individual countries, sectors or projects, estimates indicate that China's loan commitments to Latin American and Caribbean governments for the 2005-2016 period total more than US\$ 141 billion.¹
- The China Development Bank and the Export-Import Bank of China are the institutions of the State that have, since 2005, provided almost all of China's development funding in the region. The China Development Bank participated in 80% of the loans to Latin America and the Caribbean made over the 2005-2016 period.
- The main countries in the region that receive Chinese funding have significant hydrocarbon deposits, and so the terms of some of the loan agreements include a counterpart commitment of supplying petroleum products. The breakdown of those loans made between 2005 and 2016 reveals that most of the funding (93%) was extended to the Bolivarian Republic of Venezuela (44%), Brazil (26%), Ecuador (12%) and Argentina (11%).

■ **Figure I.14** ■
Latin America and the Caribbean: main recipients of Chinese financing, 2005-2016
 (Millions of dollars)



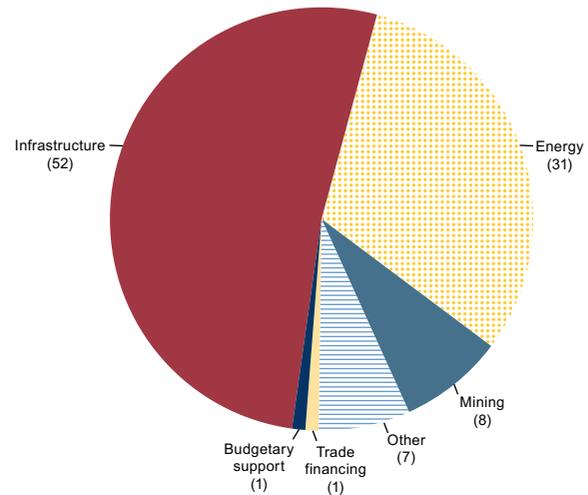
Source: K. Gallagher and G. Cipoletta, "El financiamiento para el desarrollo de China en América Latina y el Caribe", 2017, unpublished.

¹ This exceeds the amount of funding that Latin America and the Caribbean received from institutions such as the Inter-American Development Bank (IDB), the World Bank and the Development Bank of Latin America (CAF), which over the same period granted sovereign credits to the region in the amounts of US\$ 117.8 billion, US\$ 85.5 billion and US\$ 55.1 billion, respectively.

2. Chinese financing in the region is focused on infrastructure and energy

- Chinese banks funnel more than half their total lending in the region into infrastructure, almost a third is spent on hydrocarbons and power generation and distribution, and the rest is used for trade funding, budgetary support and other mixed projects.
- In addition to loans and credit lines, Chinese funding in the region makes extensive use of an innovative instrument whereby loans are extended in exchange for oil, and these “loan-for-oil” deals account for around 50% of the total funding. Through this mechanism, the Chinese banks ensure that their loans are paid back in the shape of oil shipments. This type of instrument ensures China better returns in more risky markets, because lower risk premiums are guaranteed as borrowing countries wishing to export their products to China do so by paying off their debts.
- Such instruments have been used to channel over US\$ 74 billion in just four years. The main recipients have been the Bolivarian Republic of Venezuela (six loans since 2008, for US\$ 44 billion), Brazil (in 2009, a loan worth US\$ 10 billion) and Ecuador (four loans since 2009, for a total amount of US\$ 5 billion).
- The interest rates on Chinese loans could be slightly higher than other market options for many of the region’s countries; that is not always the case, however, especially for countries with more restricted access to international capital (which is true for several of China’s leading borrowers). The lowest interest rates seen (2%) were granted by the Export-Import Bank of China in loans to the Plurinational State of Bolivia and Jamaica in 2010, which China posts on its books as part of its official development assistance.

■ **Figure I.15** ■
Latin America and the Caribbean: main recipient sectors of Chinese financing, 2005-2016
(Percentages)



Source: K. Gallagher and G. Cipoletta, “El financiamiento para el desarrollo de China en América Latina y el Caribe”, 2017, unpublished.

3. New financing instruments have been introduced, which will encourage use of the renminbi

- The significant growth in flows of Chinese finance into the region since 2005 is on account of an economic and political strategy adopted by the country's Government. The loans made by the major Chinese development banks to Latin American governments are primarily the result of the strategy of diversifying the countries' foreign exchange reserves, with a view to promoting the international use of the Chinese currency, the renminbi. They also support a strategy of directing and assisting Chinese enterprises to invest in natural resources, a geopolitical strategy and a strategy for consolidating allegiances.
- Similarly, another financing instrument that China has used in Latin America since 2009 are the currency swap agreements it has struck with four of the region's central banks (those of Argentina, Brazil, Chile and Suriname) for a total of close to US\$ 49 billion. These agreements were intended to facilitate trade and investment in yuan, but they were also introduced to improve financial conditions through the use of the loans as a relief measure against the weakening of foreign exchange reserves (for example, in Argentina in 2015).
- At the First Ministerial Meeting of the Forum of China and the Community of Latin America and Caribbean States (CELAC), held in 2015, the Chinese Government announced that over the next decade the country would increase its trade with Latin America and the Caribbean to US\$ 500 billion and would make investments in the region in the amount of US\$ 250 billion (mostly in infrastructure projects). The Second Ministerial Meeting of the China-CELAC Forum, which is to take place in 2018, is expected to further the discussions, cooperation and fund allocation commitments and, especially, to expand their fields of action into industry, infrastructure and sustainable development.

Map I.2

Latin America and the Caribbean: main countries with the presence of Chinese banks and currency swaps, 2005-2016



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of D. Arner and A. Soares, *A Globalized Renminbi: Will it reshape Latin America?*, Washington, D.C., Atlantic Council, May 2016.

° Renminbi Qualified Foreign Institutional Investor (RQFII) programme.

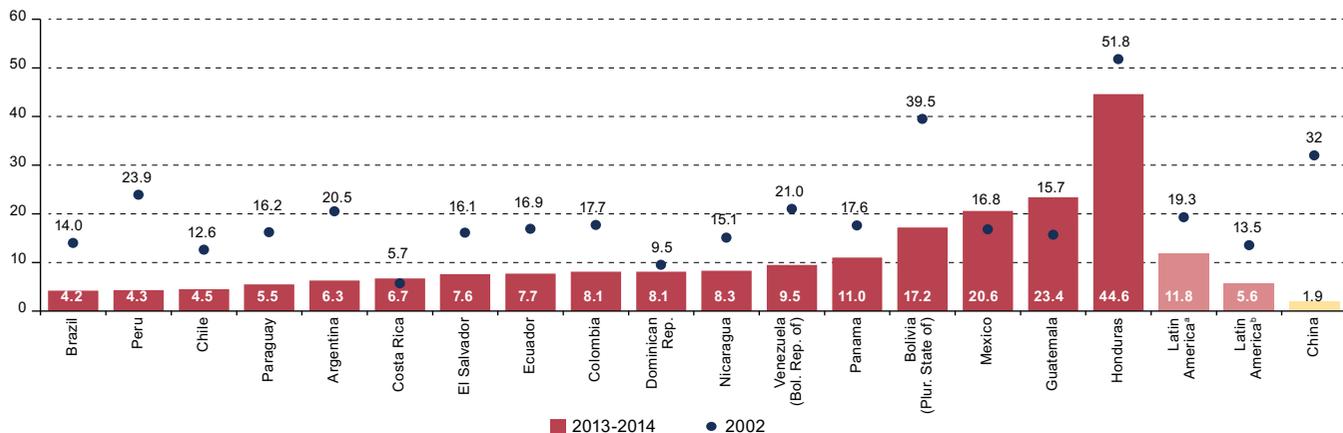
II. Social context in China, Latin America and the Caribbean and sustainable development challenges

1. Poverty levels have fallen in Latin America and China, but inequality remains high

■ Figure II.1 ■

Latin America (17 countries) and China: population living in extreme poverty, around 2002 and 2013-2014

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of special tabulations of data from household surveys conducted in the respective countries for Latin America, and figures from the World Bank for China.

Note: On the basis of US\$ 1.90 per person per day at 2011 purchasing power parity (PPP). The data correspond to the values published by each country for the year closest to 2002 and for the period 2013-2014.

^a Weighted average, calculated on the basis of special tabulations of data from household surveys conducted in the respective countries.

^b Weighted average, calculated on the basis of World Bank population and poverty data of US\$ 1.90 per person per day at 2011 purchasing power parity (PPP).

- Extreme poverty levels have been reduced considerably in both Latin America and China over the course of this century. However, in six Latin American countries 10% or more of the population still live in extreme poverty, while in three of them the figure is 20% or more. The regional total is 38 million people.¹ Using comparable series reveals that the level of extreme poverty in Latin America is three times that of China.²
- The size of the population living in poverty has shrunk considerably in Latin America and China, but between one and two thirds of the population in seven Latin American countries is still affected by poverty—an estimated total of 168 million people across the region—which, according to World Bank data,³ is similar to the number of people living in poverty in China.
- According to comparable data series, at the beginning of the century China had poverty rates similar to those of the Latin American countries with the highest levels of poverty. While China reduced its poverty rate by 45 percentage points, Latin America reduced it by 12.4 percentage points between the two comparison periods.⁴

¹ ECLAC estimate of the number of people living with incomes below the indigence line, on the basis of special tabulations of data from household surveys conducted in the respective countries.

² World Bank, on the basis of income below US\$ 1.90 per capita at purchasing power parity (PPP).

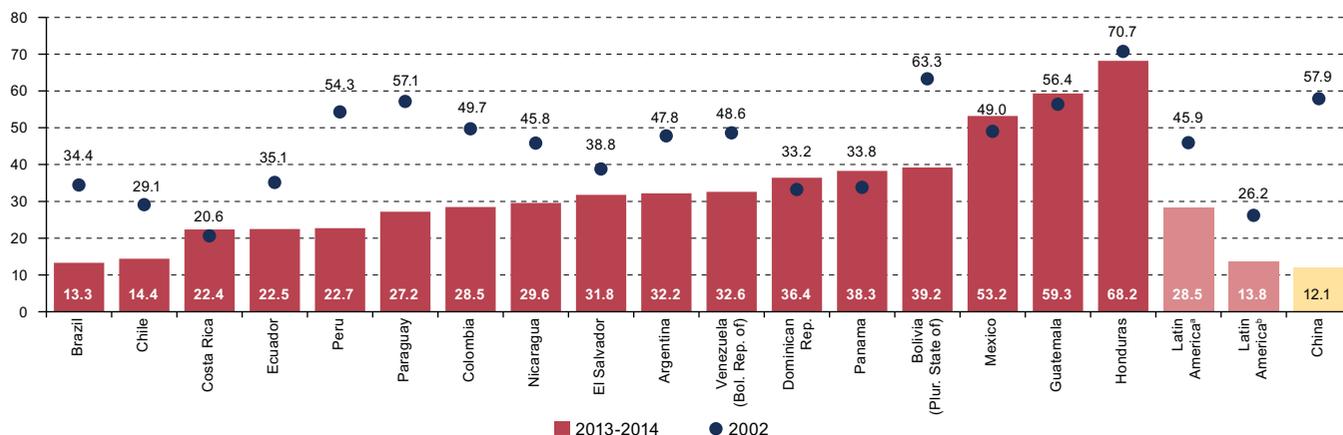
³ The regional total is an ECLAC estimate of the number of people living with incomes below the poverty line, on the basis of special tabulations of data from household surveys conducted in the respective countries.

⁴ The fall in China's poverty rate is an estimate calculated using World Bank data, on the basis of income below US\$ 3.20 per capita at PPP.

■ **Figure II.2** ■

Latin America (17 countries) and China: population living in poverty, around 2002 and 2013-2014

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official data from the respective countries for Latin America and figures from the World Bank for China.

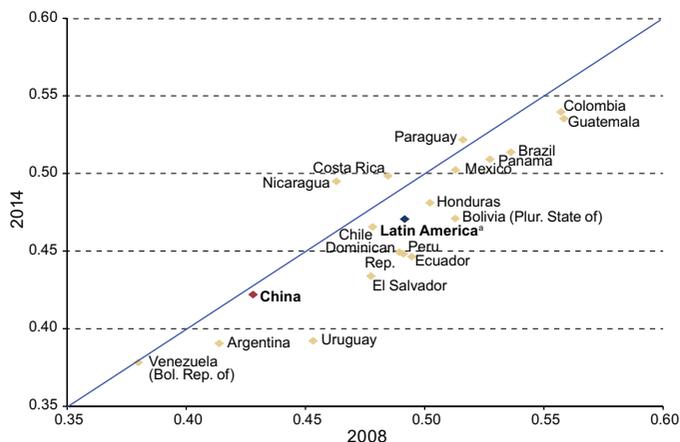
Note: On the basis of US\$ 3.20 per person per day at 2011 purchasing power parity (PPP). The data correspond to the values published by each country for the year closest to 2002 and for the period 2013-2014.

^a Weighted average, calculated on the basis of special tabulations of data from household surveys conducted in the respective countries.

^b Weighted average, calculated on the basis of World Bank population and poverty data of US\$ 3.20 per person per day at 2011 purchasing power parity (PPP).

■ **Figure II.3** ■

Latin America (18 countries) and China: Gini coefficient, 2008 and 2014



Source: Economic Commission for Latin America and the Caribbean (ECLAC), inequality estimates on the basis of special tabulations of data from household surveys conducted in the respective countries for Latin America, and World Bank figures for China.

Note: Data for China refer to 2008 and 2012.

^a Simple average of the countries.

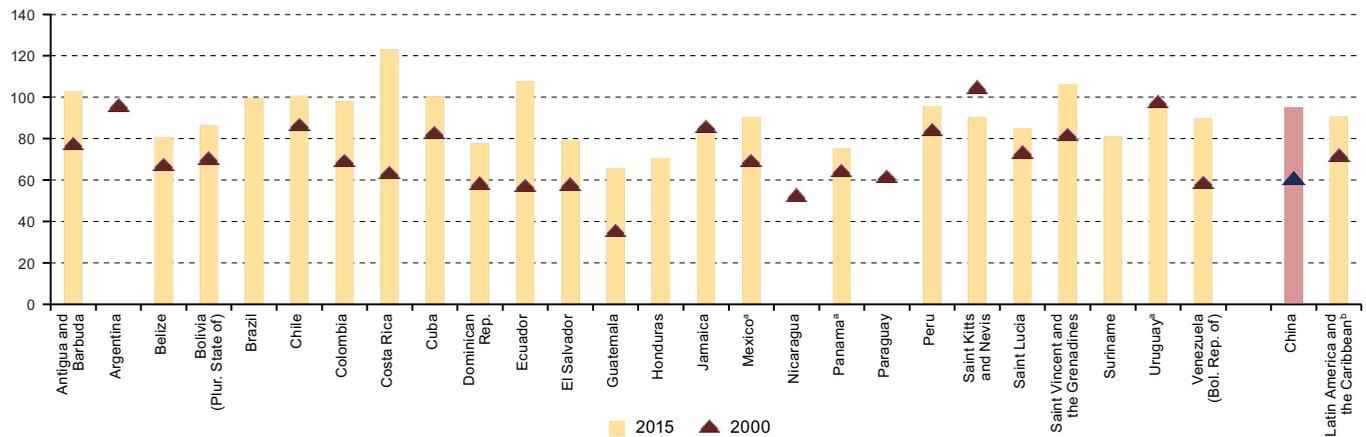
Although income inequality has decreased, it remains high in both Latin America and China. This inequality is heterogeneous among the countries of the region, and the improvements in the Gini coefficient in some Latin American countries (for example, Chile, Mexico and the Bolivarian Republic of Venezuela) and in China were very modest during the period under consideration. Significant progress was made in other countries of the region (such as the Plurinational State of Bolivia, Ecuador, El Salvador, Peru, Dominican Republic and Uruguay). In contrast, Costa Rica, Nicaragua and Paraguay suffered setbacks. In addition to a reduction in income inequality, most of the region's countries saw an improvement in the functional distribution of income (wages as a share of GDP).

2. Both the region and China have expanded education coverage, but significant challenges remain

- China has close to 260 million students and over 15 million teachers, and a broad and diverse education system to cover the entire population. The decentralized education system is State-run with little involvement of the private sector. In addition, the Ministry of Education has shifted from direct control to macro-level monitoring of the education system (OECD, 2016).⁵
- Meanwhile, Latin America and the Caribbean has around 128 million students in primary and secondary education (UNESCO Institute for Statistics), with education systems that vary from one country to another.

■ Figure II.4 ■

Latin America and the Caribbean (22 countries) and China: gross enrolment rate in secondary education, 2000 and 2015
(Percentages)



Source: UNESCO Institute for Statistics [online] <http://data.uis.unesco.org/> [date of reference: 4 December 2017].

^a Data refer to 2014.

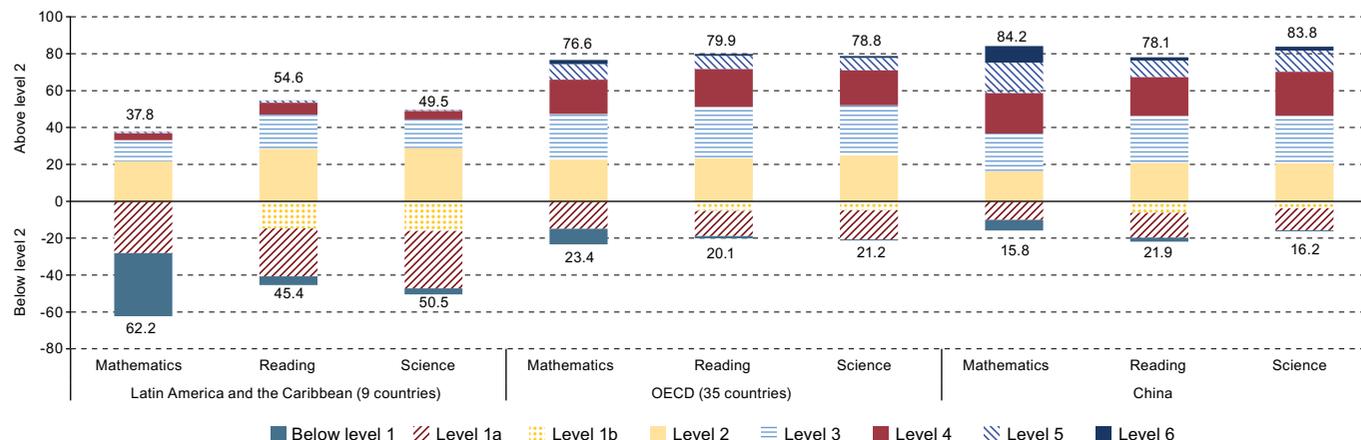
^b Simple averages.

- The gross enrolment rate in primary education reached 109.4% in Latin America and the Caribbean and 104.1% in China in 2015. Both rates are indicative of universal coverage in primary education, although there are differences among the countries of the region, just as there probably are among the different regions of China.
- The gross enrolment rate in secondary education in Latin America and the Caribbean increased from 85.2% to 92.9% between 2000 and 2015. In China, the level in 2015 was similar, but much greater progress was made, as it jumped from 61.0% to 94.3%.

⁵ Organization for Economic Cooperation and Development (OECD), *Education in China: A Snapshot*, 2016 [online] <http://www.oecd.org/china/Education-in-China-a-snapshot.pdf>.

■ **Figure II.5** ■

Latin America and the Caribbean (9 countries), Organization for Economic Cooperation and Development (OECD) (35 countries) and China: average number of students in each proficiency level in the Programme for International Student Assessment (PISA) tests in mathematics, reading and science, 2015^a
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of the Organization for Economic Cooperation and Development (OECD), Programme for International Student Assessment (PISA) 2015.

Note: Latin America and the Caribbean: Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Mexico, Peru, Trinidad and Tobago, and Uruguay. OECD: Australia, Austria, Belgium, Canada, Chile, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States. China: Beijing, Canton, Jiangsu and Shanghai.

^a Simple averages.

- China's performance in the Programme for International Student Assessment (PISA) is similar to that of the countries of the Organization for Economic Cooperation and Development (OECD). In fact, Chinese students achieved higher results in mathematics and science. However, it should be borne in mind that the metrics for China are restricted to four cities with a relatively higher level of development.
- Data from the nine countries studied in Latin America and the Caribbean indicate that much more needs to be done in the region's education systems to achieve high-quality results. A high proportion of the region's students scored poorly: 34% scored below level 1 (basic knowledge) in mathematics and between 45% and 62% scored below level 2 in all three tests. Moreover, a very low percentage

of students achieved level 4 proficiency or above, even among the higher socioeconomic groups.

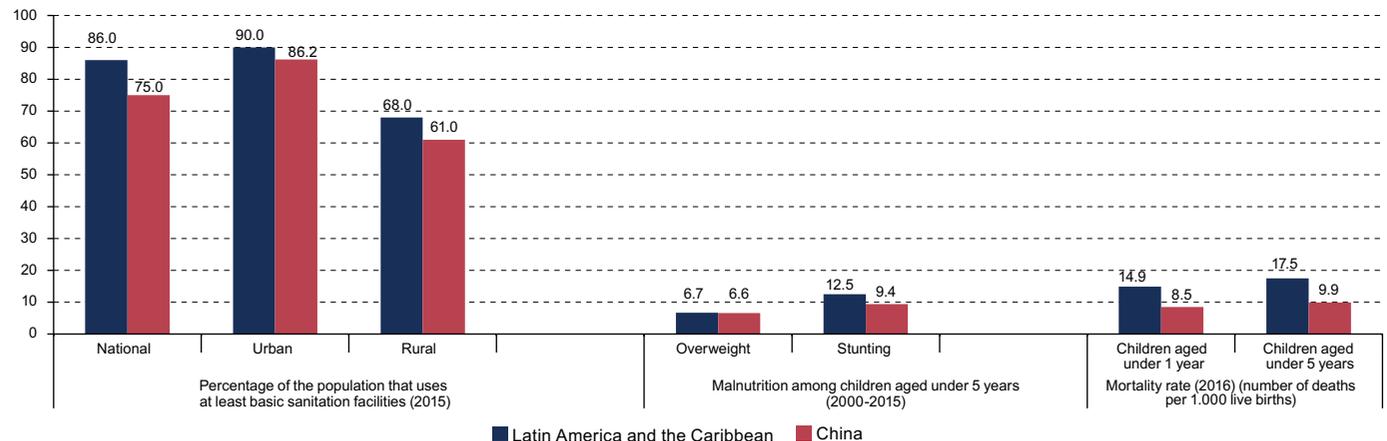
- In higher education, coverage in China and Latin America and the Caribbean is quite similar. Gross enrolment rates at this level stand at 43.4% in China and 46.3% in Latin America and the Caribbean.
- However, there are marked differences among universities. The Academic Ranking of World Universities (ARWU)—also known as the Shanghai ranking—shows that only 10 Latin American universities are among the 500 best in the world, while China has 45 (50 if Hong Kong (Special Administrative Region of China) is included). The only countries of the region whose universities feature in that ranking are Argentina, Brazil, Chile and Mexico.

3. China and Latin America and the Caribbean face similar health and nutrition challenges, especially in rural areas

- While infant mortality rates have fallen in China and the countries of the region, the levels of success have been different. In 2016, the mortality rates in Latin America and the Caribbean for both children aged under one year (14.9 deaths per 1,000 live births) and those aged under five (17.5 deaths per 1,000 live births) were higher than in China. Figures for China were 8.5 and 9.9, respectively.
- According to Global Burden of Disease data, between 1990 and 2016 average healthy life expectancy at birth increased to 68 years in China and 66.3 years in Latin America and the Caribbean.⁶ In both cases, women have, on average, four more years of healthy life than men.
- China and Latin America are both undergoing an active process of nutritional transition. While there are no differences in the prevalence of overweight and obesity, there are differences in stunting, which affects almost 1 in 10 Chinese children aged under 5 years, but is one third higher in Latin America and the Caribbean. Throughout the region, this prevalence is equivalent to 7 million children, but adds up to 8 million in China.
- The region has made huge strides with regard to sanitation—surpassing China—but more needs to be done. In both cases, rural areas have the largest shortfall in even basic sanitary facilities (32% and 39%, respectively).

■ Figure II.6 ■

Latin America and the Caribbean and China: selected health and nutrition indicators, by area of residence, 2000-2015
(Percentages and number per 1,000 live births)



Source: World Health Organization/United Nations Children's Fund (WHO/UNICEF), *Progress on Drinking Water, Sanitation and Hygiene: 2017 Update and SDG baselines*, 2017, for information on sanitation facilities; WHO, official reports on the countries of Latin America and the Caribbean, for information on malnutrition; and the estimates of the Inter-agency Group for Child Mortality Estimation, for information on mortality [online] <http://www.childmortality.org/>.

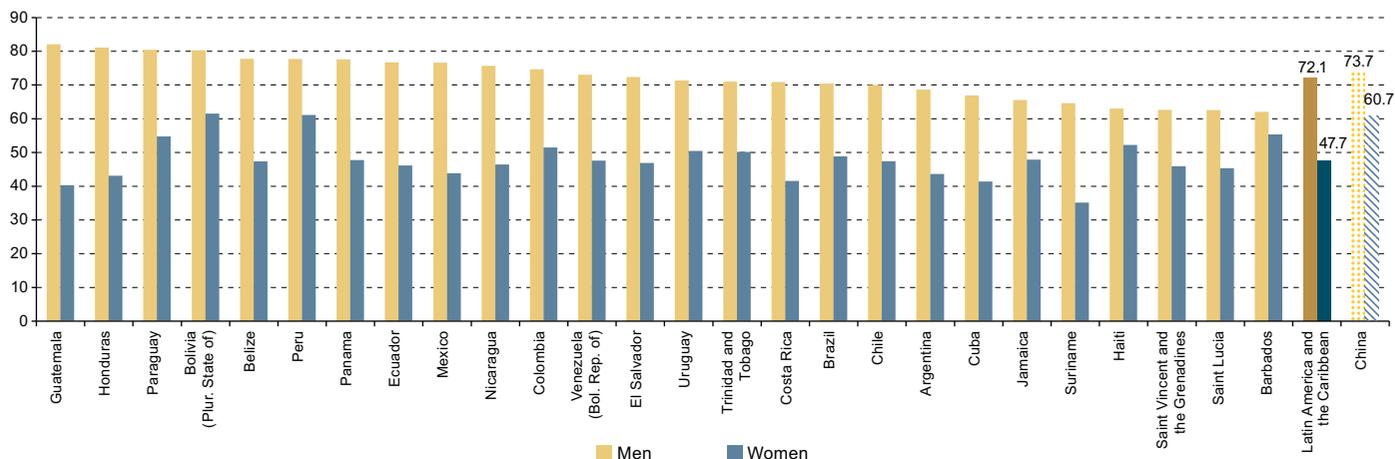
⁶ *The Lancet*, "Global, regional and national disability-adjusted life-years (DALYs) for 333 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016", vol. 390, No. 10100 [online] [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(17\)32130-X/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(17)32130-X/fulltext).

4. Closing the labour market gender gap remains a challenge for the region and China

■ Figure II.7 ■

Latin America and the Caribbean (26 countries) and China: employment rate, by sex, 2016

(Percentages)



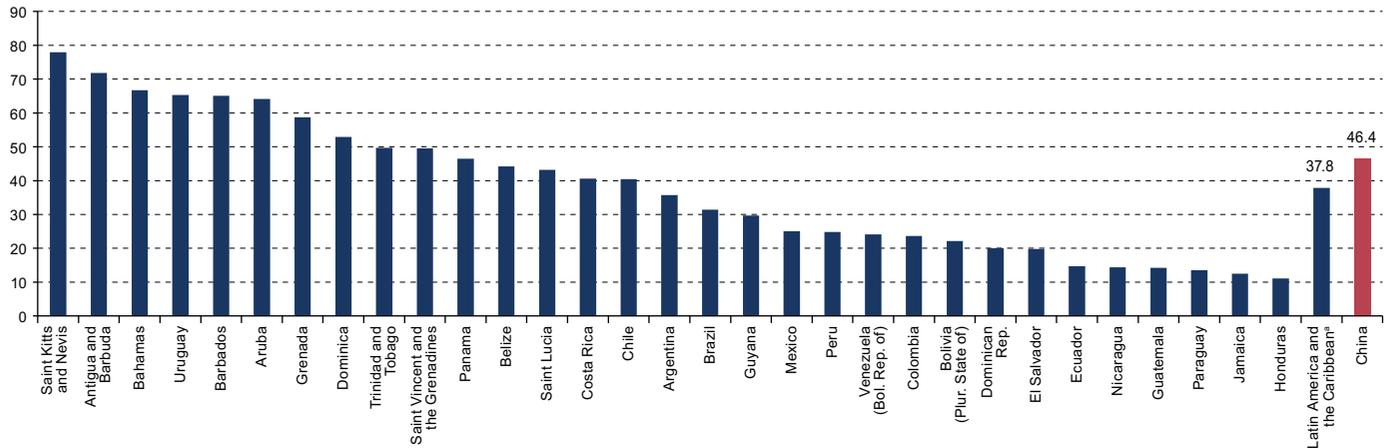
Source: International Labour Organization (ILO), ILOSTAT database [online] <http://www.ilo.org/ilostat/faces/ilostat-home?locale=en>.

- In all the countries analysed, the employment rate of men was much higher than that of women, meaning that the gender gap in the labour market remains a challenge in both Latin America and the Caribbean and in China.
- While the differences are smaller between men, the labour market participation of Chinese women (61%) is 27% higher than that of Latin American and Caribbean women. Only the Plurinational State of Bolivia and Peru saw similar levels, followed by Paraguay and Barbados.

5. Further progress towards an inclusive social protection system is also needed, especially in the region

■ Figure II.8 ■

Latin America and the Caribbean (31 countries) and China: pension system contributors, 2004-2012
(Percentages of the working-age population)



Source: International Labour Organization (ILO), Social protection [online] <http://www.social-protection.org/gimi/gess/ShowSearchIndicators.action>.
^a Simple averages.

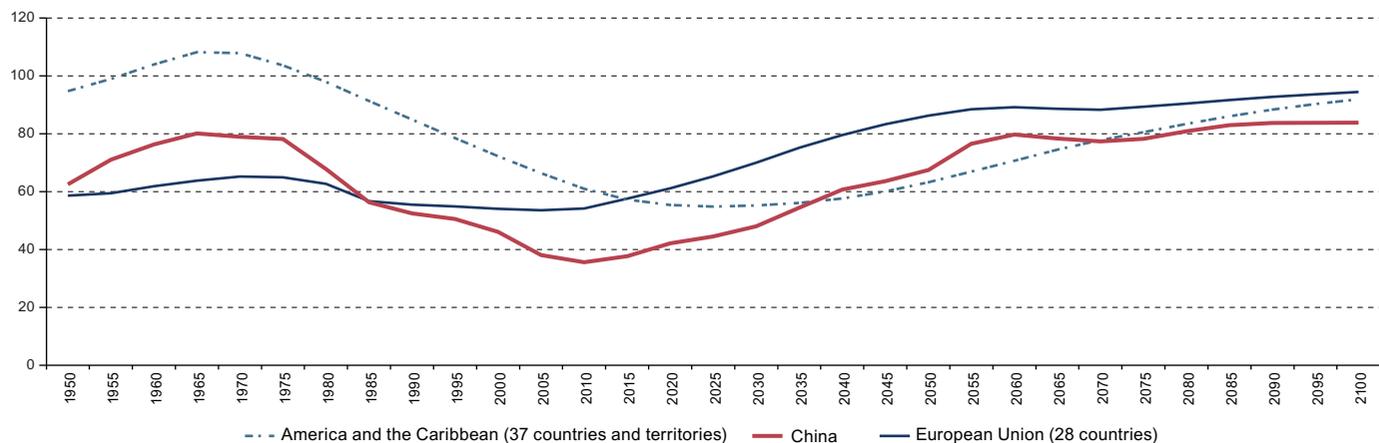
- In both China and Latin America and the Caribbean, the majority of the working-age population does not contribute to the pensions systems. The exceptions are seven countries in the Caribbean and Uruguay, where more than 50% are active contributors.
- In China, the percentage of active contributors to the pension system is more than 8 percentage points higher than the average for Latin America and the Caribbean.

6. The demographic transition offers opportunities, but also poses challenges

- The demographic transition is an opportunity for development and the demographic dividend is the clearest example of this. To take advantage of that opportunity however requires social investment in children and young people, and efforts to address new social protection challenges as a result of the growth of the older adult population, and in particular the increasing demands on the pension and care systems.
- The dependency ratio encapsulates this process and its socioeconomic effect. To date, the trend in China and in Latin America and the Caribbean has been similar, albeit at different levels—the ratio has always been lower in China.
- The future trend for China seems to be more aligned with that of the European Union, albeit at lower levels.
- The dependency ratio in the region is expected to be similar to that of China (around 0.58) by the end of the 2030s, and from then on they should both follow relatively similar patterns and levels until the 2070s. Subsequently, dependency is expected to increase in Latin America and the Caribbean as a result of population ageing.
- Average rates do not reflect territorial heterogeneity, and there are differences in trends and levels both within Latin America and the Caribbean and China.

■ **Figure II.9** ■

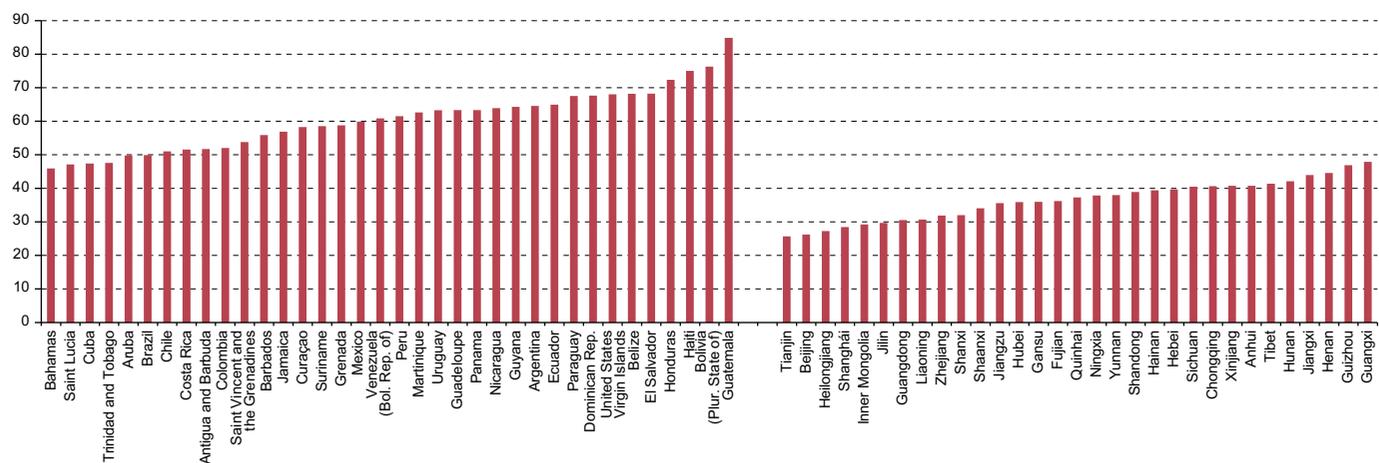
Latin America and the Caribbean (37 countries and territories), European Union (28 countries) and China: dependency ratio, 1950-2100
(Ratios multiplied by 100)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, World Population Prospects: The 2017 Revision, 2017 [online] <https://esa.un.org/unpd/wpp/>.

■ **Figure II.10** ■

Latin America and the Caribbean (36 countries and territories) and regions of China (31): gross dependency ratio, 2015
(Ratios multiplied by 100)

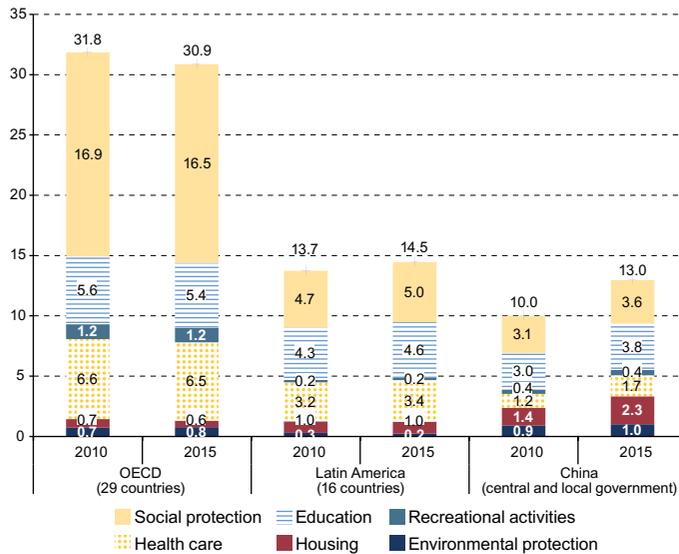


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, World Population Prospects: The 2017 Revision, 2017 [online] <https://esa.un.org/unpd/wpp/>.

7. Given the challenges, China and Latin America and the Caribbean must increase social spending

■ **Figure II.11** ■

Latin America (16 countries), Organization for Economic Cooperation and Development (OECD) (29 countries) and China: social spending, by government functions, 2000 and 2015
(Percentages of GDP)



Source: Organization for Economic Cooperation and Development (OECD), OECD.Stat for OECD countries; Economic Commission for Latin America and the Caribbean (ECLAC), Database on Social Investment in Latin America and the Caribbean [online] <https://observatoriosocial.cepal.org/investment/en> for Latin America; and Ministry of Finance for China.

Note: Data for OECD countries does not include the following countries: Australia, Canada, Chile, Mexico, New Zealand and Turkey. Latin America includes the following countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Paraguay, Peru and Uruguay.

- Social spending in Latin America is still well below that of the OECD countries, but remains slightly higher than that of China.
- China and Latin America show an upward trend. However, while social spending in the region grew by 0.8 percentage points of GDP in the first half of this decade, the increase in China was 3 percentage points of GDP. This occurred against a backdrop of Chinese economic expansion which saw per capita GDP grow by 42%, compared with growth of just 7% in Latin America and the Caribbean between 2010 and 2015.
- Since the late 1990s, China has embarked on a series of reforms of its social welfare system, which includes (old age) pensions, health care, unemployment insurance, work-related disability and maternity benefits. This is reflected in this function's composition and size in the social spending estimates.

III. Trade between Latin America and the Caribbean and China

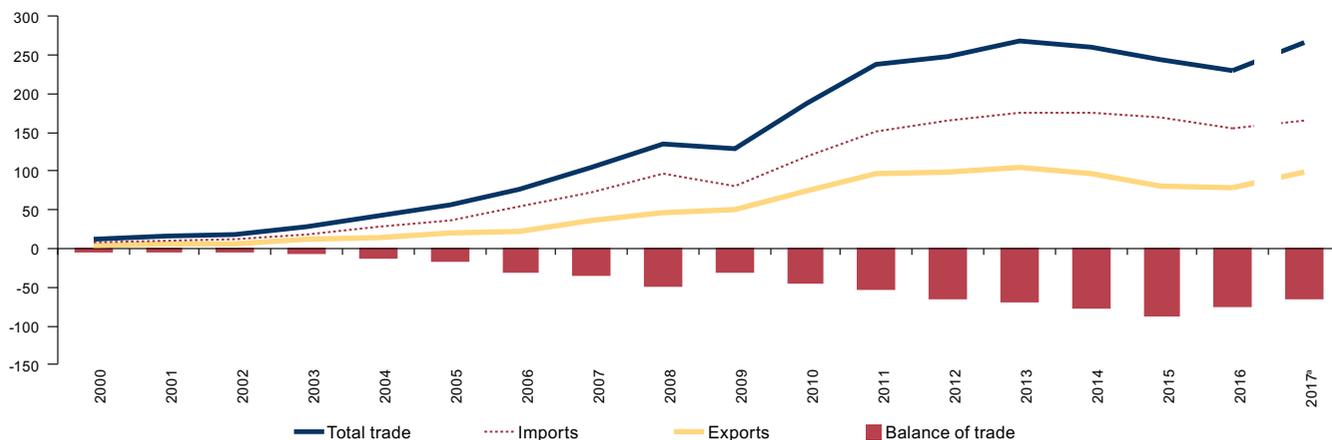
1. After falling in value for three years, trade between the region and China is forecast to post a strong recovery in 2017

- According to projections by the Economic Commission for Latin America and the Caribbean (ECLAC), the value of the trade in goods between the region and China is to grow by 16% in 2017 to reach a total of US\$ 266 billion. While slightly below the record high of US\$ 268 billion recorded in 2013, that figure indicates a significant recovery in the value of bilateral trade after three consecutive years of contraction, during which there was a cumulative drop of 14%. Particularly noteworthy is the recovery in the value of the region's shipments to China, which are projected to grow by 25% in 2017, largely on account of higher prices for oil and other commodities. Between 2013 and 2016, the value of the region's exports to China fell by 25%, which was more than twice the 11% drop in the region's imports from China: that was largely due to the
- end of what was known as the commodities supercycle. The region's trade with China traditionally runs a deficit, and the figure for 2017 has been calculated at close to US\$ 67 billion.
- According to the projections, in 2017 China received 10% of the region's total goods exports and accounted for 18% of the region's imports. This result would mean that China—already the region's second largest source of imports since 2010—is very close to displacing the European Union as the region's second largest buyer of goods. The weight of Latin America and the Caribbean in the Asian nation's foreign trade peaked in 2011, when the region accounted for 6.5% of China's exports and 7.5% of its imports; the figures have fallen since then, to 5.4% per cent of its exports and 6.4% of its imports in 2016.

■ Figure III.1 ■

Latin America and the Caribbean: goods trade with China, 2000-2017

(Billions of dollars)



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

* Figures for 2017 are projections.

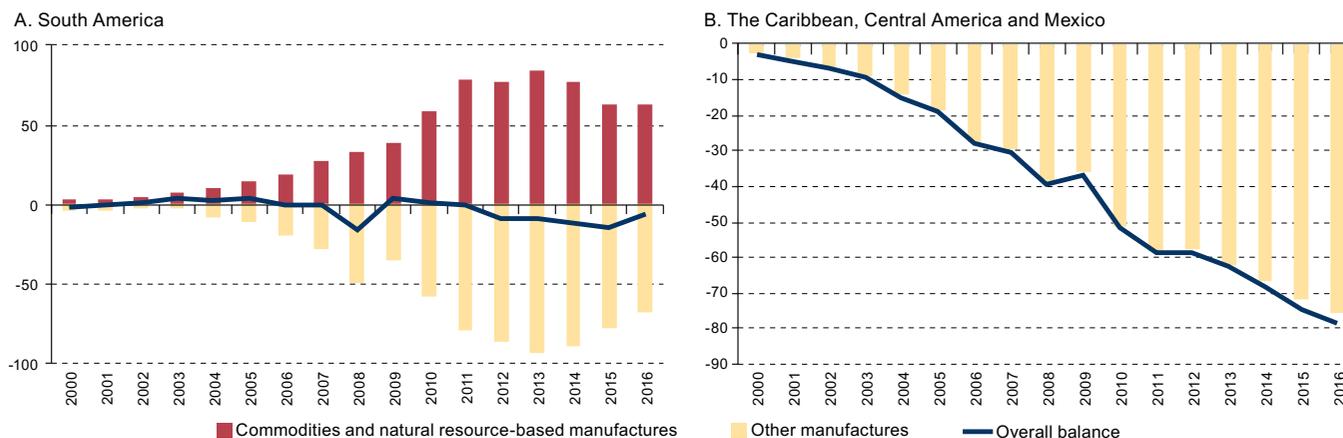
2. South America's trade with China is very different from that of the rest of the region

- With a surplus in commodities and manufactures based on natural resources that is only slightly smaller than its deficit in other manufactured goods, South America's overall trade balance with China sits close to the equilibrium point. In contrast, given their different export specialization,

the Caribbean, Central America and Mexico report an overall deficit with China, which has risen constantly since the start of the century, from US\$ 3.0 billion in 2000 to US\$ 78.0 billion in 2016. Almost all of this deficit is the result of trade in industrial goods.

■ Figure III.2 ■

Latin America and the Caribbean (selected subregions): trade balance with China, 2000-2016
(Billions of dollars)



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

3. Almost all the region's countries have trade deficits with China

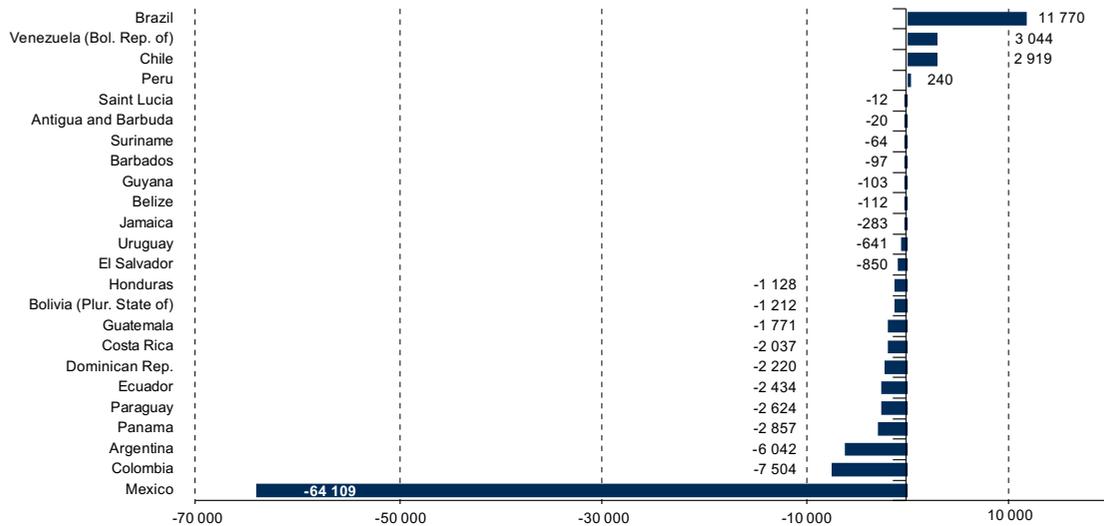
- Traditionally, only three countries in the region have run trade surpluses with China, and all three are from South America: the Bolivarian Republic of Venezuela, Brazil and Chile. Exports of a small number of commodities account for the surpluses of all three. In 2016, this group expanded

to include Peru. At the other extreme is Mexico, which alone accounts for two-thirds of the total trade deficit of all the region's countries that run deficits with China. This is because while only 1.4% of Mexico's 2016 exports went to China, 18% of its imports that year came from there.

■ Figure III.3 ■

Latin America and the Caribbean (24 countries): balance of trade with China, 2016

(Millions of dollars)



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

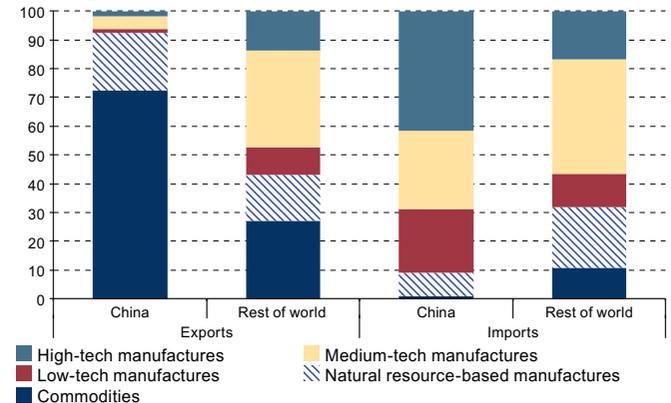
4. The region’s trading relations with China are very different from their trade with the rest of the world

- The export basket China receives from Latin America and the Caribbean is much less sophisticated than the region’s shipments to the rest of the world: in 2016, commodities accounted for 72% of the region’s exports to China, compared to 27% of its shipments to the rest of the world; in contrast, low-, medium- and high-technology manufactures accounted for just 8% of the region’s exports to China, compared to 57% of its global exports. For imports, the situation is reversed: in 2016, while low-, medium- and high-tech manufactures accounted for 91% of the region’s imports from China, their share in imports from the rest of the world —while still high in absolute terms, at 68%— was substantially lower in comparative terms. In other words, trade between Latin America and the Caribbean and China remains clearly inter-industry: raw materials for manufactures.

■ Figure III.4 ■

Latin America and the Caribbean: structure of trade with China and the rest of the world by level of technology, 2016

(Percentages)



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

5. A few commodities dominate the region's shipments to China

- Just five products, all of them commodities, account for 70% of the total value of the region's exports to China. The top 20 exports to China come almost exclusively from the mining and hydrocarbons sectors, along with a few agricultural and forestry products. The only industrial goods that appear on the list are gearboxes and vehicles;

these, however, represent a mere 1% of the region's shipments to China. In line with this, in most of the region's countries, the number of products exported to the region's own market outstrips the number of products exported to China by more than a factor of ten.

■ Table III.1 ■

Latin America and the Caribbean: top 20 products exported to China, 2016

(Millions of dollars and percentages)

Ranking	Code in the Harmonized Commodity Description and Coding System	Description	Amount (millions of dollars)	Share (percentages)
1	120190	Soybeans	17 328	21.8
2	260300	Copper ore and concentrates	12 439	15.6
3	260111	Iron ores and concentrates	10 203	12.8
4	740311	Refined copper (copper cathodes)	8 371	10.5
5	270900	Oil	7 038	8.8
6	470329	Chemical wood pulp, non-coniferous	2 025	2.5
7	020230	Beef, boneless cuts, frozen	1 353	1.7
8	740200	Unrefined copper; copper anodes for electrolytic refining	1 125	1.4
9	020714	Poultry cuts and offal, frozen	998	1.3
10	230120	Flours, meals and pellets, of fish or crustaceans	917	1.2
11	470321	Chemical wood pulp, coniferous	868	1.1
12	170114	Cane sugar, raw	827	1.0
13	080929	Cherries, fresh	671	0.8
14	261610	Silver ores and concentrates	585	0.7
15	271019	Petroleum oils and oils obtained from bituminous minerals	584	0.7
16	740400	Copper waste and scrap	573	0.7
17	260700	Lead ores and concentrates	441	0.6
18	260800	Zinc ores and concentrates	425	0.5
19	870840	Gearboxes for tractors, vehicles for more than 10 people	403	0.5
20	870323	Tourism vehicles	381	0.5
		Total top 20 products	67 554	84.8
		Total exports	79 636	100.0

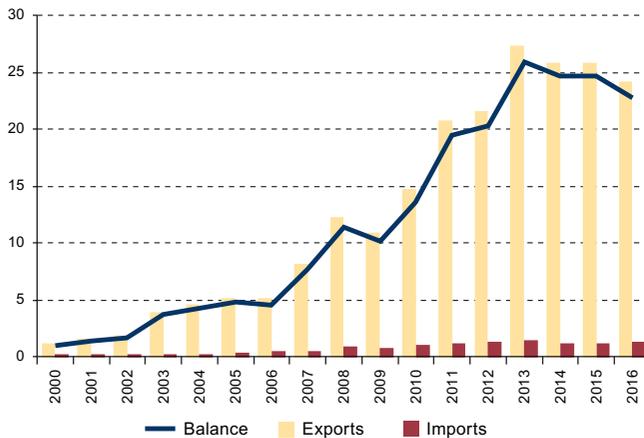
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the United Nations Commodity Trade Statistics Database (COMTRADE).

6. Agriculture is a promising option for diversifying the region's exports to China

- The region runs a sizeable agricultural trade surplus with China, totalling almost US\$ 23 billion in 2016. The share of agricultural products in the region's exports to China has also been on the increase over the current decade, up from 20% in 2010 to 30% in 2016. The share of the region's total agricultural shipments to the world bought by China has also risen sharply, from under 3% in 2000 to 13% in 2016.

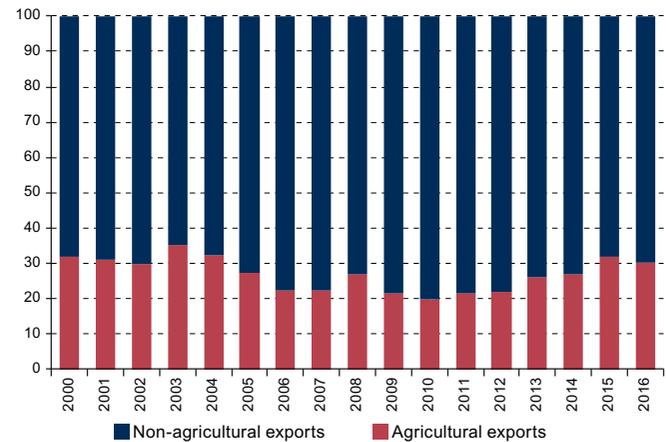
Similarly, the region's weight within China's agricultural imports has increased markedly, from 16% in 2000 to 26% in 2016. That share is almost equal to that of Canada and the United States combined, and is higher than that of competitors such as the Association of South East Asian Nations (ASEAN) (14%) or that of Australia and New Zealand combined (10%).

■ **Figure III.5** ■
Latin America and the Caribbean: agricultural trade with China, 2000-2016
(Billions of dollars)



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

■ **Figure III.6** ■
Latin America and the Caribbean: structure of goods exports to China, 2000-2016
(Percentages)

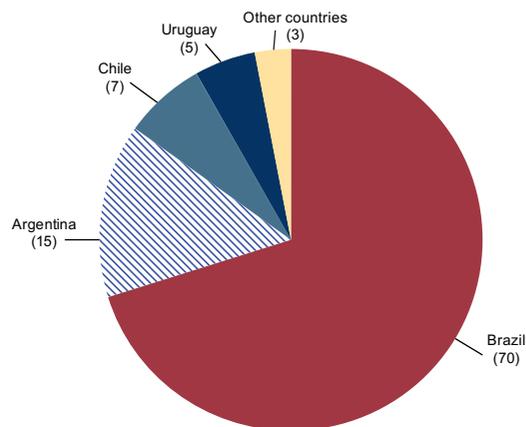


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the United Nations Commodity Trade Statistics Database (COMTRADE).

7. However, the region's agricultural exports to China are highly concentrated in certain countries of origin and products

- The region's agricultural exports to China are even more concentrated than their total shipments to that country: a single product (soybeans) accounted for 72% of the total export value in 2016. With the exception of wine, processed products command a minimal share of the region's current agricultural exports to China. There is also a high level of country concentration: Brazil alone contributes 70% of the value of the sector's shipments to China, and just four countries —Argentina, Brazil, Chile and Uruguay— together account for 97%.

■ **Figure III.7** ■
Latin America and the Caribbean: agricultural exports to China by country of origin, 2016
(Percentages)



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

■ **Table III.2** ■
Latin America and the Caribbean: top 10 agricultural exports to China, 2016
(Millions of dollars and percentages)

Ranking	Code in the Harmonized Commodity Description and Coding System	Description	Amount <i>(millions of dollars)</i>	Share <i>(percentages)</i>
1	120190	Soybeans	17 328	71.6
2	020230	Beef, boneless cuts, frozen	1 353	5.6
3	020714	Poultry cuts and offal, frozen	998	4.1
4	170114	Cane sugar, raw	827	3.4
5	080929	Cherries, fresh	671	2.8
6	240120	Tobacco, partly or wholly stemmed/stripped	343	1.4
7	080610	Grapes, fresh	247	1.0
8	220421	Wine in containers of less than 2 litres	219	0.9
9	020329	Pork, frozen	215	0.9
10	150710	Crude soybean oil	173	0.7
		Total top 10 products	22 373	92.5

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

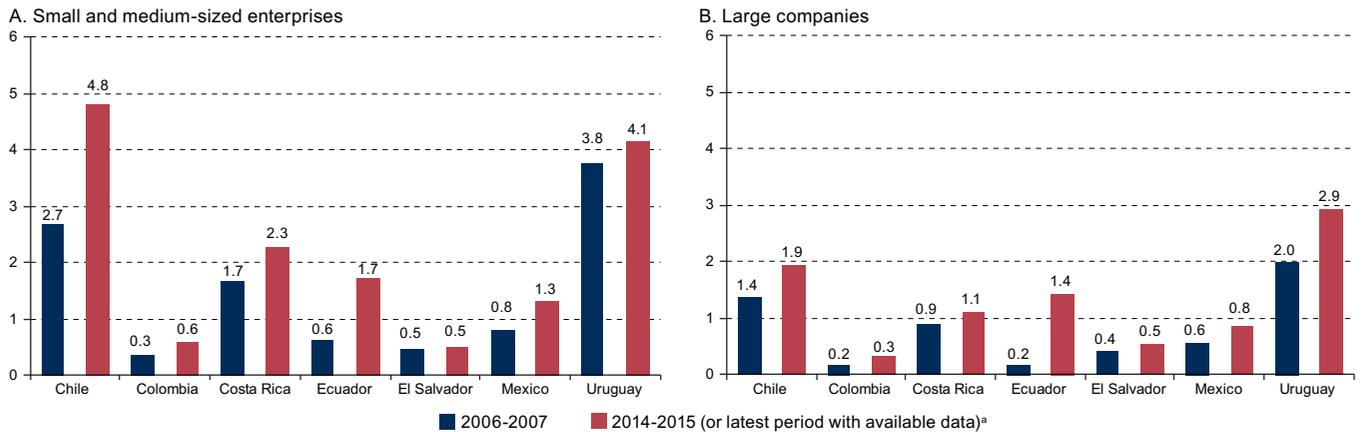
8. The numbers of companies exporting to China and the numbers of products exported per company are evolving differently from one country to the next

- In the seven countries of the region where such information is available, the number of businesses exporting to China per 100,000 inhabitants rose over the past decade, with increases in the numbers of both small and medium-sized

enterprises (SMEs) and large companies. In contrast, the average number of products exported varies dramatically from one company to the next, and several cases of reductions have been reported.

■ Figure III.8 ■

Latin America and the Caribbean (7 countries): number of businesses exporting to China per 100,000 inhabitants, by company size, averages for 2006-2007 and 2014-2015 (or latest period with available data)

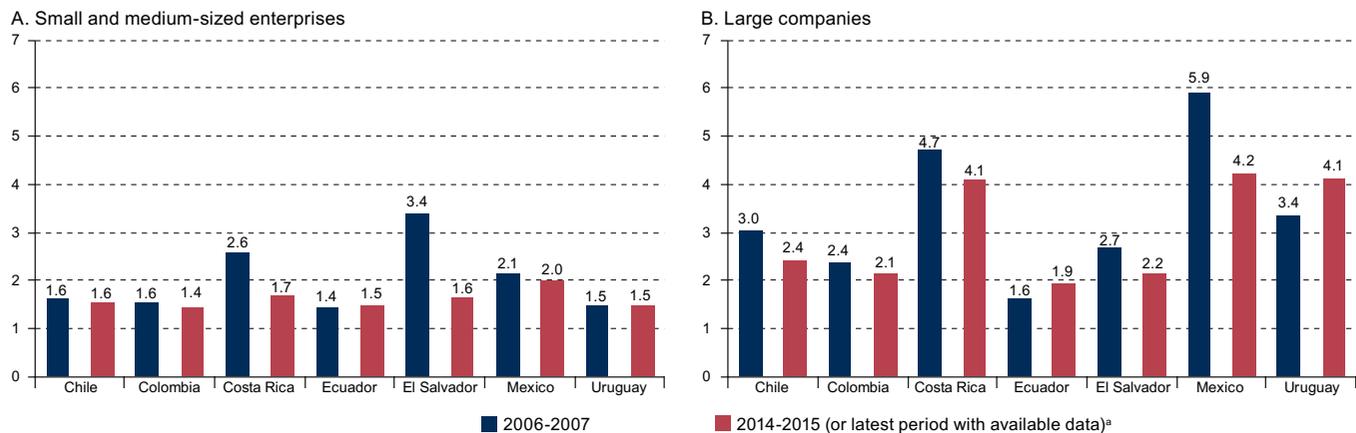


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from the customs services of the respective countries.

^a For Colombia, the most recent period with available data is 2013-2014; for Costa Rica, 2011-2012; for El Salvador, 2012-2013; for Mexico, 2013-2014; and for Uruguay, 2011-2012.

■ Figure III.9 ■

Latin America and the Caribbean (7 countries): average number of products exported to China per company, by business size, averages for 2006-2007 and 2014-2015 (or latest period with available data)



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

^a For Colombia, the most recent period with available data is 2013-2014; for Costa Rica, 2011-2012; for El Salvador, 2012-2013; for Mexico, 2013-2014; and for Uruguay, 2011-2012.

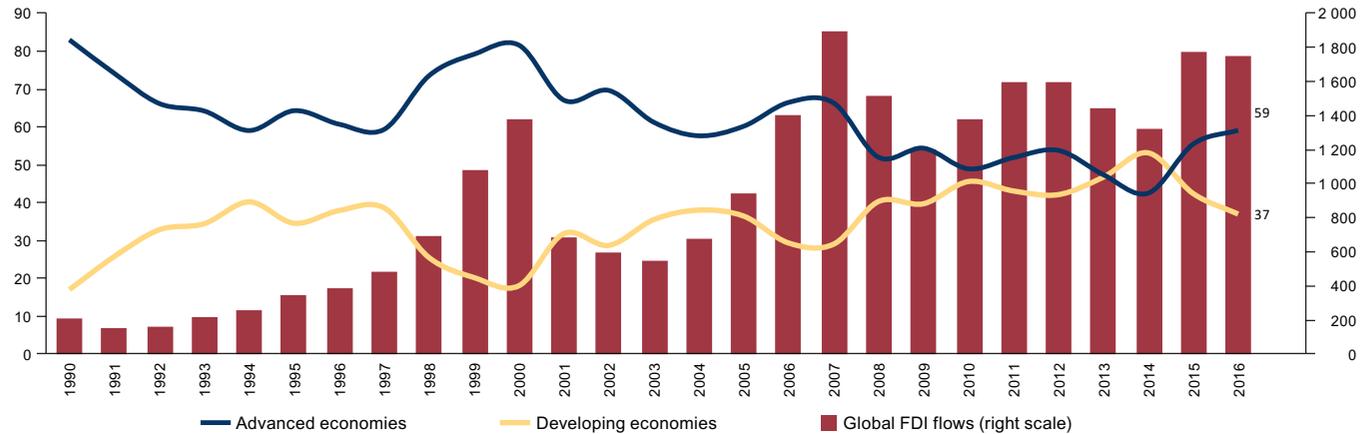
IV. Chinese foreign investment in Latin America and the Caribbean: opportunities to promote a renewed relationship

1. Global flows of foreign direct investment (FDI) returned to the advanced economies in 2016

■ Figure IV.1 ■

Global FDI flows by groups of economies, 1990-2016

(Billions of dollars and percentages)



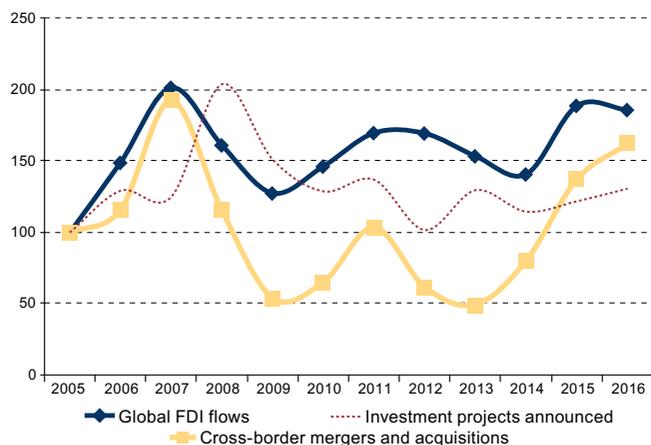
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and United Nations Conference on Trade and Development (UNCTAD), *World Investment Report, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva, 2017.

- 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. 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. All the developing subregions received less investment. FDI declined in Africa (3%), owing to weak mineral prices, and in Asia (15%), while average inflows dropped by 7.8% in Latin America.
- In 2016, the main recipients of FDI were the United States, the United Kingdom and China and Hong Kong SAR. The triad of Europe, the United States and Eastern Asia were once again the top FDI recipients.

2. There has been a dramatic surge in mergers and acquisitions, with the emergence of China as a major buyer

- Cross-border mergers and acquisitions accounted for a large share of investment in 2016. They increased by 18% compared with the previous year, with a net value of \$ 869 billion, accounting for around half of global FDI flows.
- 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%). Unlike mergers and acquisitions which were concentrated in developed countries, the top host countries for new projects were developing economies (62% of the total announced for 2016).
- Cross-border mergers and acquisitions were concentrated in developed economies, driven by greater international liquidity and industry strategies that led to major transactions. Moreover, to develop the capacities needed to deal with the changes arising from the fourth industrial revolution, many companies in traditional sectors acquired high-tech enterprises located mainly in the United States and the European Union, which further increased the weight of transactions in these markets. In 2016, 91% of the global net value of mergers and acquisitions targeted companies in developed economies, where the amount of transactions increased by 24% compared with the previous year, while it fell by 18% in developing economies.
- 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. 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 net.

■ **Figure IV.2 ■**
Global FDI flows, net cross-border mergers and acquisitions and volume of projects announced, 2005-2016
 (Index: 2005=100)

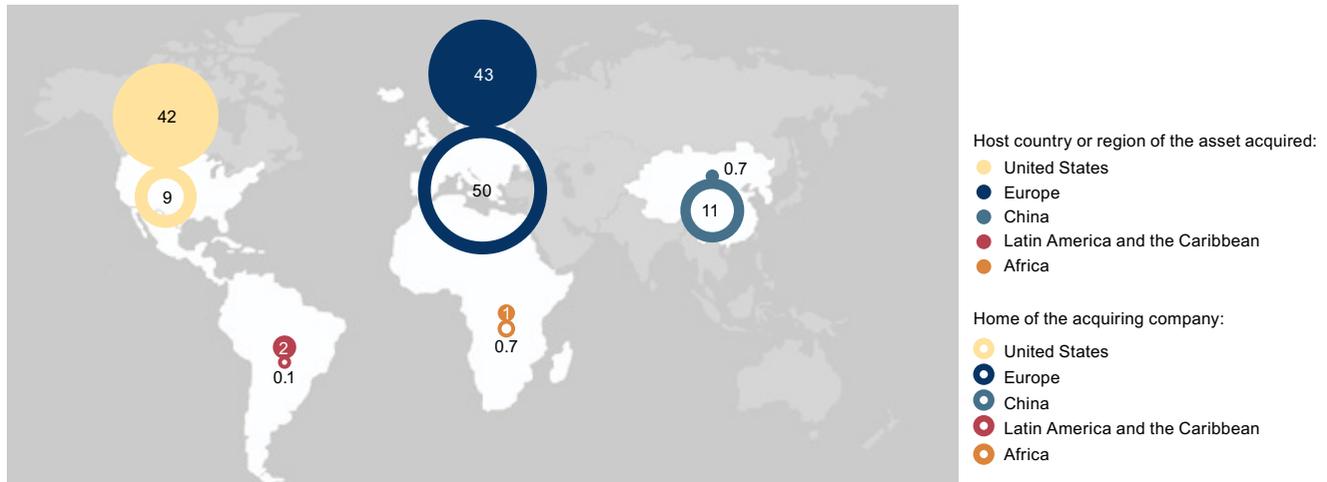


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and United Nations Conference on Trade and Development (UNCTAD), *World Investment Report, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva, 2017, and Financial Times, *fDi Markets*.

■ **Figure IV.3** ■

Share of selected countries and regions in global mergers and acquisitions, 2016

(Percentages)



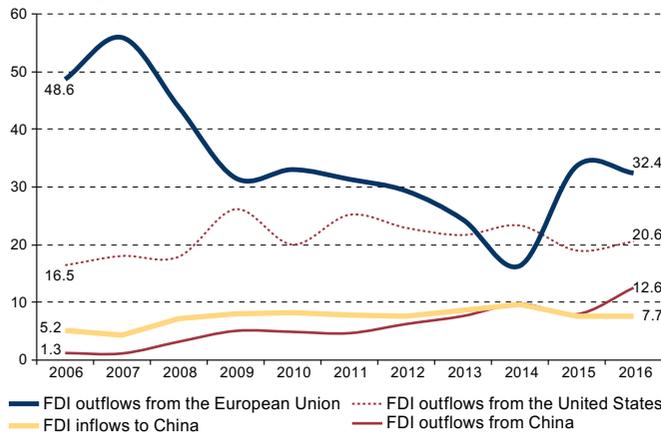
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and United Nations Conference on Trade and Development (UNCTAD), *World Investment Report, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva, 2017.

3. By 2016, China had become the second largest investor country after the United States

■ **Figure IV.4** ■

European Union, United States and China: share of global FDI inflows and outflows, 2006-2016

(Percentages)



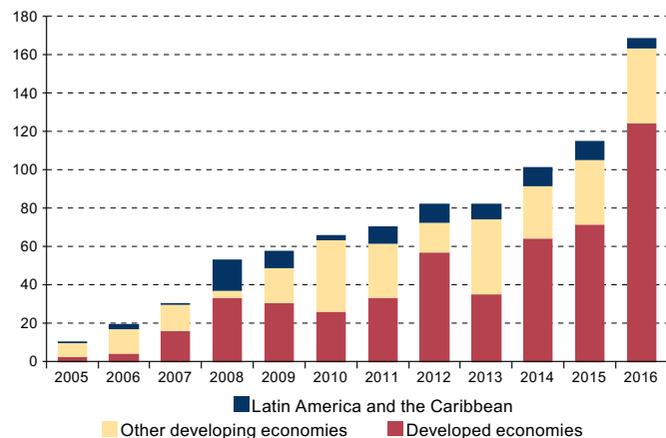
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and United Nations Conference on Trade and Development (UNCTAD), *World Investment Report, 2017: Investment and the Digital Economy* (UNCTAD/WIR/2017), Geneva, 2017.

- FDI inflows into China fell by 1% in 2016, while the country’s share of investments abroad continued to grow. A decade ago, FDI outflows from China accounted for barely 1.3% of global flows, compared with 16.5% for the United States (the largest investor). By 2016, China’s share of global FDI outflows had risen to 12.6%, making it the world’s second largest investor after the United States (20.6%).
- 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, particularly through mergers and acquisitions.
- China’s investments abroad reached a record high of US\$ 183.1 billion in 2016 and, for the first time, exceeded FDI inflows, making that country a net investor.

4. Chinese transnational corporations are looking for opportunities in advanced economies

■ Figure IV.5 ■

China: FDI outflows by groups of destination economies, 2005-2016
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of China Global Investment Tracker; The American Enterprise Institute and The Heritage Foundation.

- The highest growth in FDI outflows from China was due to investments in developed economies. In 2016, 51% of FDI from China went to Europe and North America.
- Although Chinese 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. The total value would have been even higher if antitrust authorities in the United States and the European Union had not blocked the acquisition of Syngenta, 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 Europe and the United States 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.

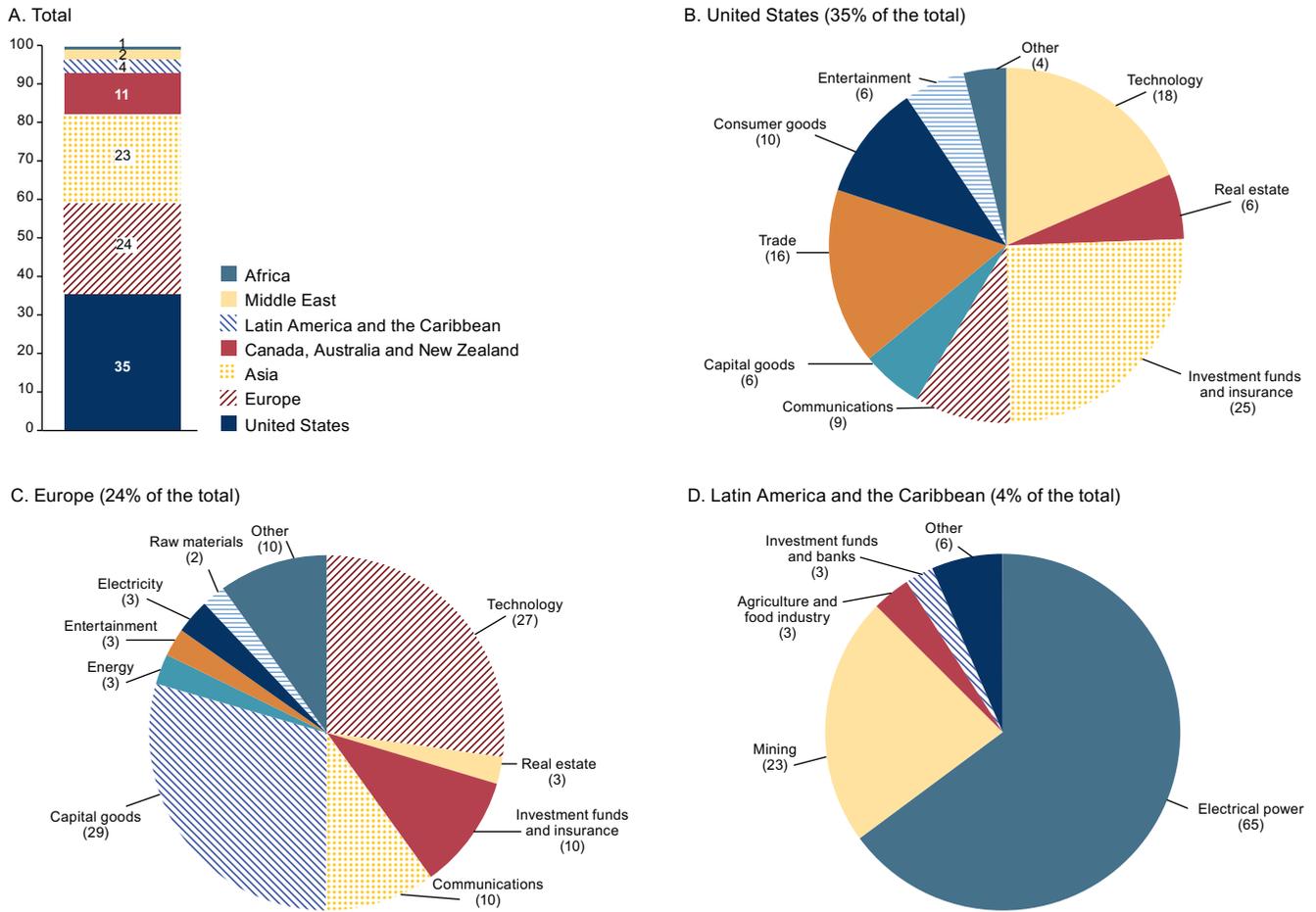
5. Analysis of Chinese mergers and acquisitions reveals a differentiated strategy depending on the geographic market

- Nearly 60% of the value of mergers and acquisitions made by Chinese companies between 2015 and 2016 was concentrated in Europe and the United States. Asia remains a major destination for Chinese companies, which account for 23% of total acquisitions in that region. Meanwhile, a small percentage of Chinese companies' acquisitions, barely 4% of the total, were in Latin America and the Caribbean.
- Analysis of the destination sectors in Europe, the United States and Latin America and the Caribbean reveals a differentiated strategy depending on the region. Most mergers and acquisitions in Europe and the United States were in high-tech activities and capital goods, indicating that Chinese companies are looking for high-quality strategic assets.
- However, Chinese companies invested in just a few sectors in Latin America and the Caribbean. The vast majority of acquisitions (88%) were in the energy and mining sectors, indicating that Chinese companies' strategy in the region is to exploit natural resources and supply the energy market.

■ **Figure IV.6** ■

China: cross-border mergers and acquisitions by country or region and sector, 2015-2016

(Percentages of total value)



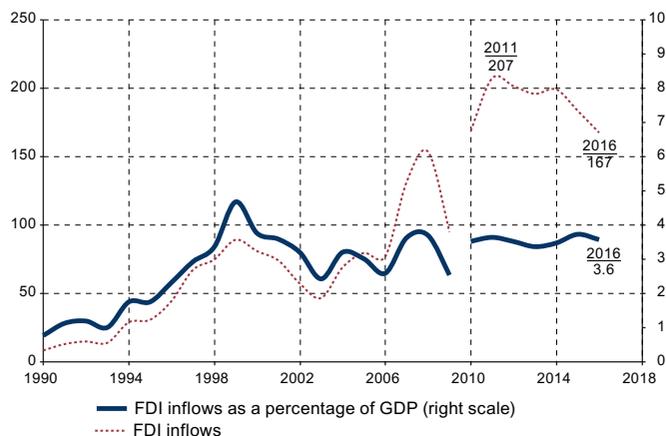
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from Bloomberg.

6. Total FDI inflows to Latin America and the Caribbean fell by 7% in 2016

■ Figure IV.7 ■

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.

- In 2016, investment in Latin America and the Caribbean fell for the second year in a row, reaching levels similar to those seen six years ago. In spite of this, FDI flows stood at 3.6% of GDP, while the global average was 2.5%, revealing the importance of transnational corporations in the region's economies.

- While the situation among countries and subregions has been heterogeneous, 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). With the exception of Paraguay, FDI inflows to other South American countries decreased. 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.

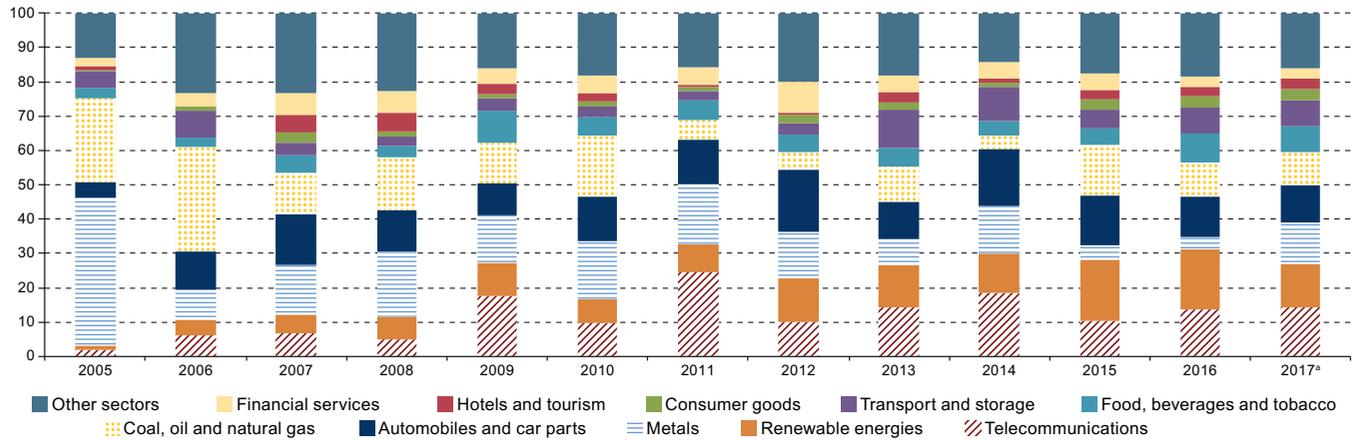
7. The development of non-conventional energy presents an opportunity for Chinese investment

- The sectoral composition of investment projects announced in the region changed substantially between 2005 and 2017, owing to the end of the commodity price boom, the expansion of the digital economy, the upturn in the automotive industry in Brazil and Mexico, and the rapid development of renewable energies.
- The value of investment announced in the fossil fuel sector fell from 30% of the region's total in 2006 to 10% in 2017. This decline was offset by the strong growth in renewable energies, with announced investments increasing from 1% of the total in 2005 to 18% of investment in the region in 2016, amounting to US\$ 13 billion.
- The alternative energy sector was the main recipient of new FDI projects in the region in 2016 (as of October 2017, it was second, behind the telecommunications sector). The increase in the number of non-conventional renewable energy projects reflects the enormous potential of Latin American and Caribbean countries to support a global transformation that can tackle the risks associated with climate change and develop alternative, clean and efficient sources of energy.

■ **Figure IV.8** ■

Latin America and the Caribbean: investment announcements, by sector, 2005-October 2017

(Percentages)



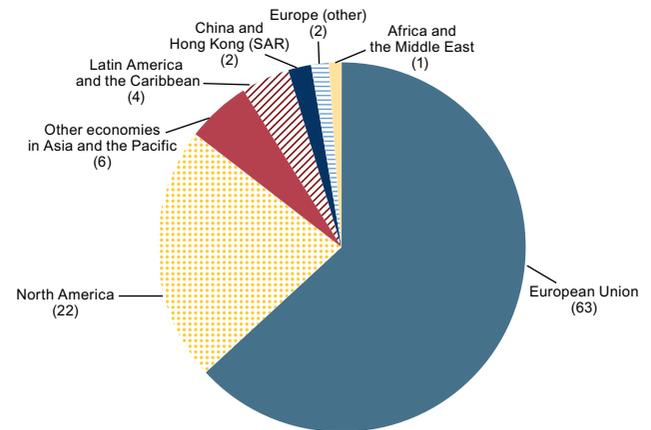
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, *fDi Markets*.
 * January-October.

- Despite China's considerable clout in alternative energy production globally, investment announced by Chinese companies only accounted for 2% of the total in the sector in Latin America and the Caribbean between 2005 and October 2017. However, that does not reflect the substantial increase in Chinese investments in renewable energies in the region, which went from nonexistent before 2010 to making up 5% of the total announced by China between 2011 and 2016.

■ **Figure IV.9** ■

Latin America and the Caribbean: announcements of investment in renewable energy, by region of origin, 2005-October 2017

(Percentages)

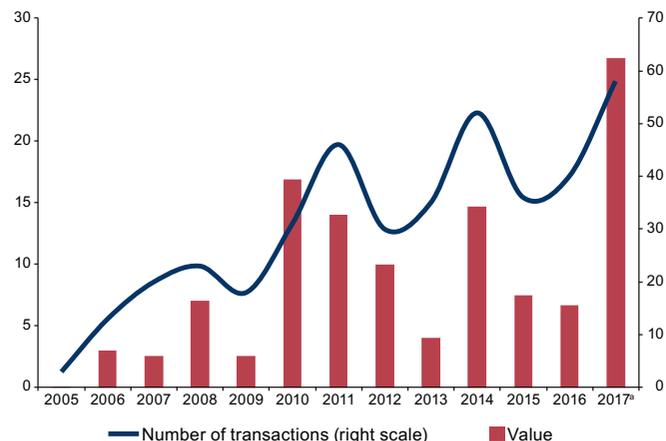


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, *fDi Markets*.

8. Chinese FDI in Latin America and the Caribbean has increased markedly over the last 10 years, but remains concentrated in a few countries

- Close to US\$ 90 billion have entered the region from China between 2005 and 2016, representing approximately 5% of FDI inflows to Latin America and the Caribbean.
- However, the information available suggests that it is quite likely that there will be a marked increase in both the absolute value and in China's share in the FDI inflows to the region in 2017. Investment by Chinese companies in Latin America and the Caribbean in 2017 is estimated to be more than US\$ 25 billion, equivalent to around 15% of total inflows to the region that year.
- The acquisition of Brazilian electricity companies had a significant impact on the 2017 figures, as will be seen below.
- Brazil has received 55% of investments made by Chinese companies in the region since 2005, including 2017 estimates, followed by Peru, with 17%, and Argentina, 9%. Thus, the top three recipient countries account for 81% of Chinese FDI inflows to the region.

■ **Figure IV.10** ■
Latin America and the Caribbean: estimated FDI inflows from China, 2005-October 2017
(Billions of dollars and number of transactions)

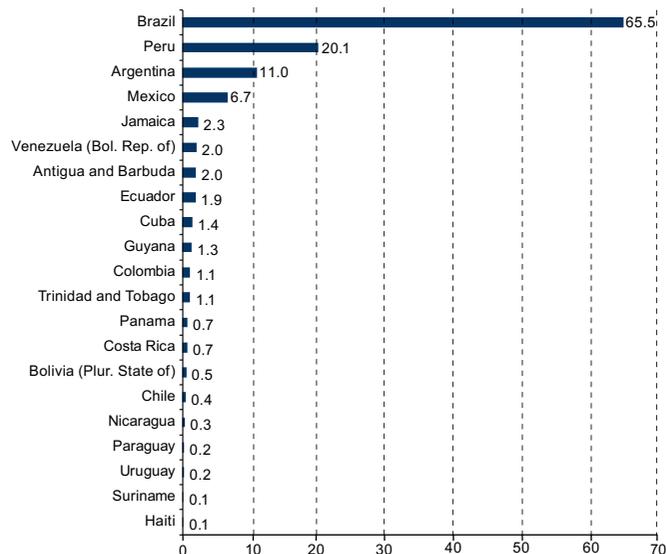


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, *fDi Markets*, and Bloomberg.

Note: The estimate includes the value and number of mergers and acquisitions and projects announced.

^a January-October.

■ **Figure IV.11** ■
Latin America and the Caribbean (21 countries): estimated FDI inflows from China, by country of destination, 2005-October 2017
(Billions of dollars)



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

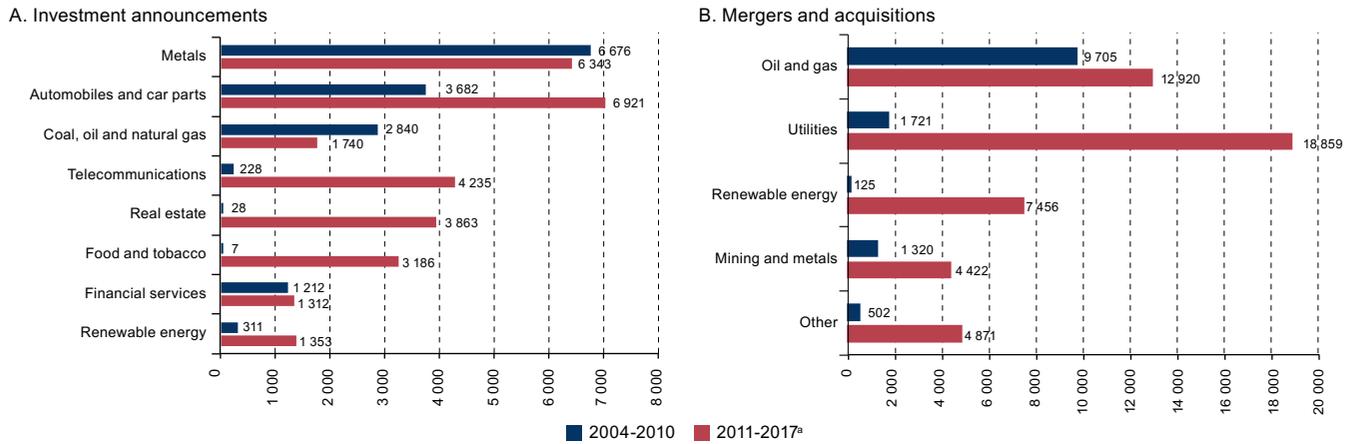
Note: The estimate includes the value of mergers and acquisitions and projects announced.

9. Since 2010, Chinese FDI in the region has diversified and embraced new sectors

■ Figure IV.12 ■

Latin America and the Caribbean: destination sectors for investment announcements and for mergers and acquisitions, by Chinese companies, 2004-October 2017

(Millions of dollars)



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

^a Data for 2017 cover the period January-October.

- To date, mining has been the most attractive sector for the development of new Chinese investment projects in the region, receiving 27% of the total value of investments announced between 2004 and October 2017. In recent years, however, there has been some diversification at the sectoral level. While metals and fossil fuels accounted for 42% and 18%, respectively, of the total announced between 2004 and 2010, more recently (2011-2017) those sectors accounted for only 20% and 6%, respectively. This change was offset by higher investments in sectors such as telecommunications, real estate, food or renewable energy, indicating that Chinese companies are interested in entering new sectors in the region.
- The energy sector has been the main target of mergers and acquisitions by Chinese companies in Latin America and the Caribbean. With regard to acquisitions by Chinese companies in the region, 49% of the total amount went to this sector and 12% to renewable energy. Meanwhile, mining and utilities accounted for 9% and 33% of the total, respectively. In this connection, the considerable growth in Chinese investments in 2017 was due to the sale of major Brazilian energy companies, the value of which exceeded US \$ 17 billion.

■ **Table IV.1** ■**China: major acquisitions in Latin America and the Caribbean, 2016-2017**

	Corporation	Assets acquired	Asset location	Sector	Value (millions of dollars)
2016	China Molybdenum Co. Ltd.	Anglo American-niobium and phosphates	Brazil	Mining	1 500
	China Three Gorges Corporation	Duke Energy International, Brazil Ltda.	Brazil	Energy	1 200
	Hainan Airlines Co. Ltd.	Azul S.A. (23.7%)	Brazil	Transport	450
January to November 2017	GIC Pte Ltd (Singapore), Brookfield Infrastructure Partners LP (Canada), China Investment Corporation (China)	Nova Transportadora Do Sudeste SA (90%)	Brazil	Energy	5 200
	State Grid Corporation of China	CPFL Energia SA (100%)	Brazil	Energy	10 290
	State Power Investment Corporation	Sao Simao Hydroelectric Power Plant Brazil	Brazil	Energy	2 250
	CITIC Agricultural Industry Fund Management Co Ltd	Dow Agro Sciences Sementes & Biotecnologia Brasil Ltda	Brazil	Chemicals	1 100
	Shandong Gold Mining Co Ltd	Barrick Gold Corporation gold mine in Veladero (50%)	Argentina	Mining	960

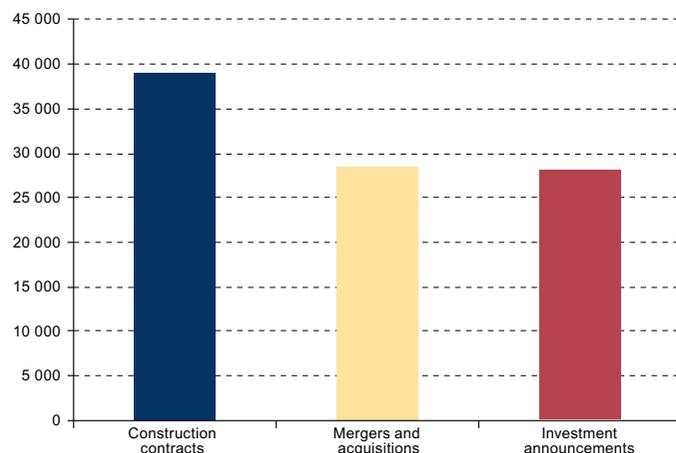
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from Bloomberg.

10. In addition to traditional investments, China and the countries of Latin America and the Caribbean have established links through construction contracts

■ **Figure IV.13** ■

China: construction contracts and investment in Latin America and the Caribbean, 2011-2016

(Millions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of China Global Investment Tracker; The American Enterprise Institute; The Heritage Foundation; Financial Times, *fDi Markets* and Bloomberg.

- In addition to investment projects and mergers and acquisitions, construction contracts with Chinese companies took on increasing importance in Latin America and the Caribbean. In many cases, these construction contracts are awarded by the State and receive funding from Chinese banks.
- Between 2011 and 2016, a number of Chinese companies were awarded construction contracts in the region worth nearly US\$ 40 billion, 40% higher than the total value of new projects and of mergers and acquisitions during the same period, which amounted to US\$ 28 billion.
- Most of the contracts were in the energy (accounting for 66% of the contracts' total value between 2011 and 2016) and transport (16%) sectors. Large hydroelectric projects accounted for the majority (40%) of those contracts.

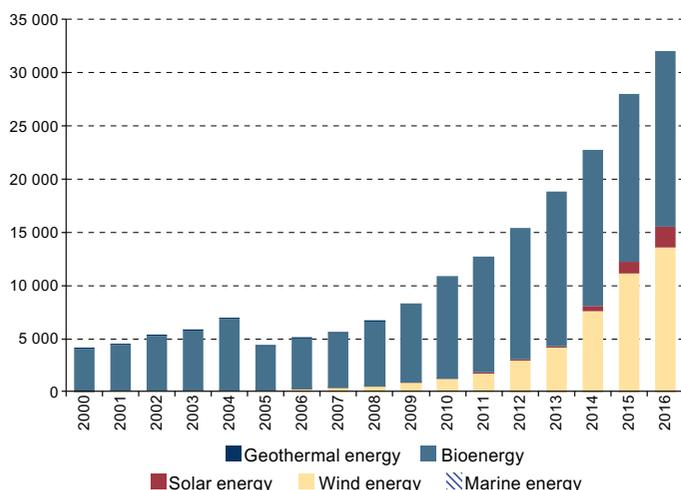
V. Opportunities for cooperation between China and Latin America and the Caribbean in renewable energy, energy interconnection and infrastructure, in the framework of the global commitment to tackle climate change

A. Renewable energy, energy interconnection and infrastructure

1. There have been significant and promising developments in renewable and clean energy in Latin America and the Caribbean in recent years

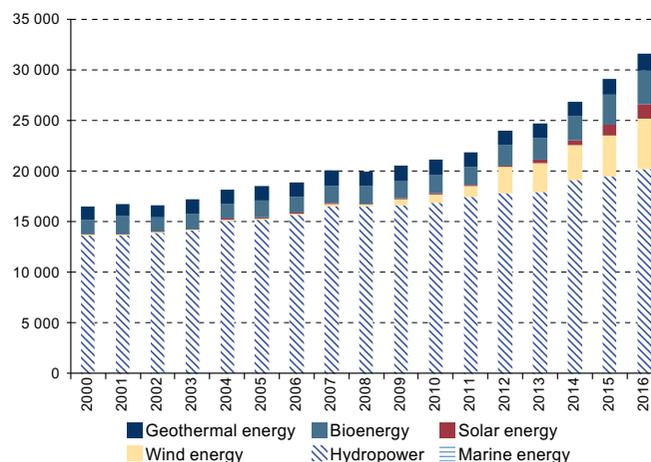
- In South America, solar energy has been incorporated into the renewable energy matrix only in the last three years. In the same period, wind power production expanded considerably thanks to new facilities, particularly in Brazil and Uruguay. Hydroelectricity has also increased sharply since 2014. Meanwhile, the relative importance of bioenergy has declined since the biofuels boom between 2008 and 2013 (mainly in Brazil and Colombia). At the same time, the contribution of new geothermal plants in the subregion has been insignificant.
- In Central America, the Caribbean and especially Mexico, new installations led to rapid growth in solar energy production in 2015, but that growth slowed sharply in 2016. Wind energy production followed a similar trend, although new installed capacity has been in place since 2012; the sector expanded considerably in Mexico. In the hydroelectric sector, where the number of new plants installed has been dwindling since 2011, production picked up sharply in 2016 as new (relatively large) stations came online in some Central American countries. At the same time, the relative importance of bioenergy has increased since 2014, as facilities began to grow again at a rate last seen in the mid-2010s, while new geothermal plants in the subregion have made no significant contribution over the last four years.

■ **Figure V.1** ■
South America: incorporation of new renewable energy installed capacity, excluding hydropower, 2000-2016
(Megawatts)



Source: International Renewable Energy Agency (IRENA), Resource dashboard, 2017.
Note: Does not include hydropower, which on average accounted for 93% of new installed capacity during this period.

■ **Figure V.2** ■
Mexico, Central America and the Caribbean: incorporation of new renewable energy installed capacity, 2000-2016
(Megawatts)

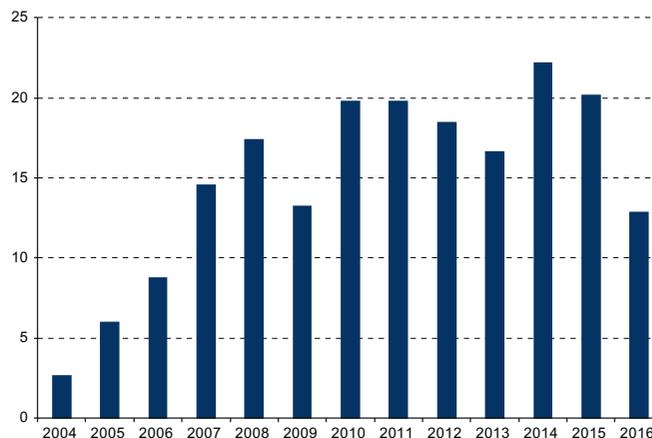


Source: International Renewable Energy Agency (IRENA), Resource dashboard, 2017.

2. Investment in renewable energy peaked in 2014 but has declined since then, owing to falling oil prices, among other factors

- In Latin American and Caribbean countries, excluding Brazil, investment in renewable energy increased considerably in 2010 and reached a peak in 2014 (US\$ 14 billion), but fell sharply in the last biennium, especially in 2016, when it tumbled by almost 50%. One of the main reasons for this was the substantial drop in oil prices since 2013.
- In Brazil, investment peaked in 2008 (US\$ 11.5 billion), owing mainly to investments in large bioethanol plants and the implementation of the Alternative Sources of Energy Incentive Programme (PROINFA), which promotes the installation of wind, small hydroelectric and biomass plants. Notwithstanding the economic crisis that began in 2015, investment in renewable energy in Brazil has, to date, held steady at about US\$ 7 billion per year, particularly in new wind and bioenergy plants.

■ **Figure V.3** ■
Latin America and the Caribbean: total investment in renewable energy, 2004-2016
(Billions of dollars)



Source: International Renewable Energy Agency (IRENA), Resource dashboard, 2017.

3. Unlocking the region's enormous renewable energy potential will require investment in transmission and storage within and among countries

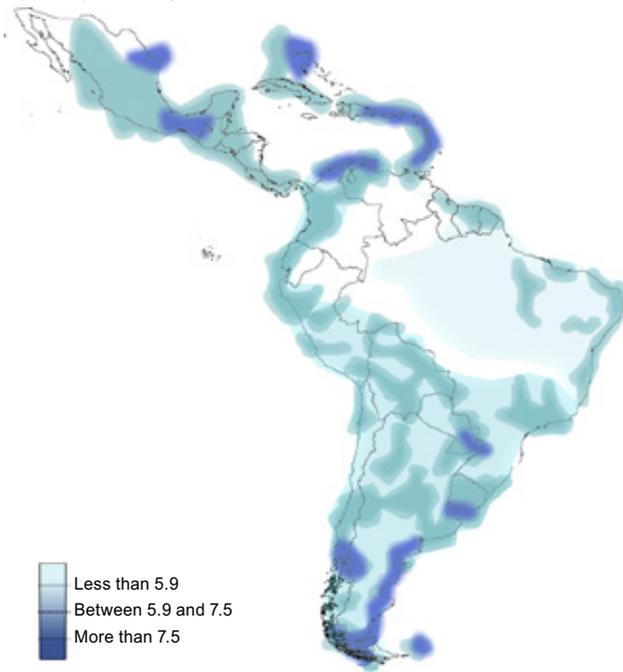
- The region has unparalleled solar and wind energy resources. It is also rich in hydraulic resources that could provide “natural storage” for energy produced by intermittent

sources (such as solar and wind). Hence, investment is needed in electrical interconnections to manage and transfer these resources within and among countries.

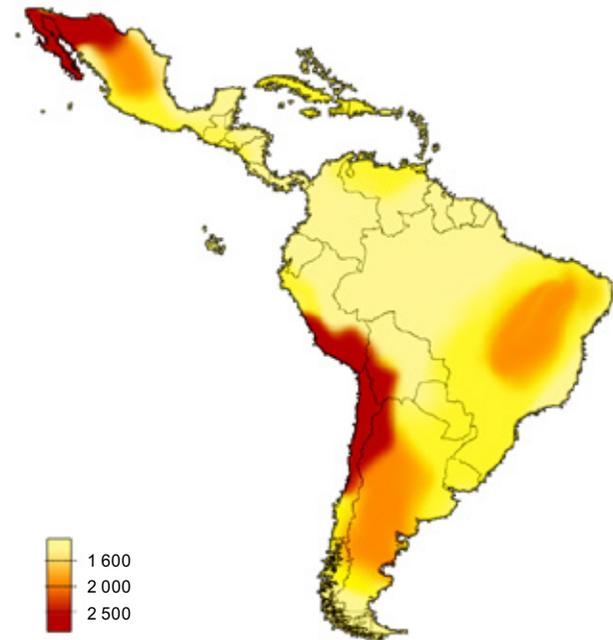
■ Map V.1 ■

Latin America and the Caribbean: wind and solar energy potential

A. Wind speed at 80 metres
(metres per second)



B. Annual average direct solar radiation, 2009-2013
(kilowatt hours per square metre)



Source: J. Paredes, *La Red del Futuro: Desarrollo de una red eléctrica limpia y sostenible para América Latina*, Inter-American Development Bank (IDB), 2017.

4. There are plans to expand electricity generation in South America through medium-sized plants, a strategy that may not be entirely successful owing to the lack of interconnections within and among countries

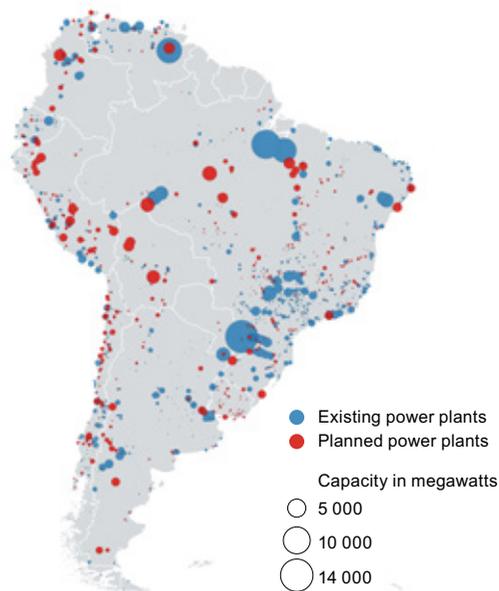
- Unlike in previous years, when the focus was on building large plants (represented on map V.2A by blue circles), plans for expanding electricity generation in South American countries to meet future demand will prioritize medium-sized plants (represented by red circles).
- Demand for electricity is expected to increase considerably along the length of the Andes, offering an opportunity to

implement the Andean Electrical Interconnection System (SINEA) advocated by the Inter-American Development Bank (IDB). However, as can be seen on map V.2B, there is a serious lack of interconnections, potentially providing an opportunity for cooperation between China's technological and financial capacities and the strategic plans of the region's countries.

■ Map V.2 ■

South America: existing and projected capacity for electricity generation and interconnections

A. Existing and projected capacity for electricity generation



B. Existing interconnections



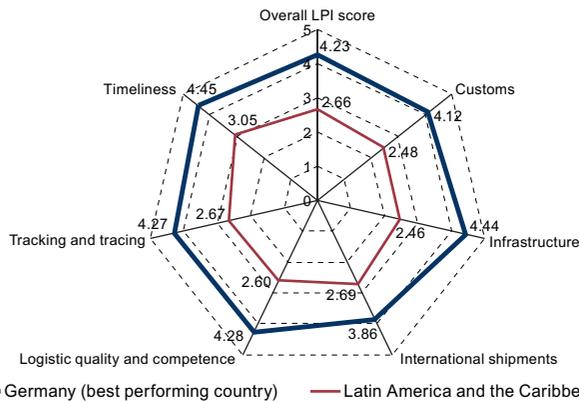
Source: Economic Commission for Latin America and the Caribbean (ECLAC), "Situación y perspectivas de las redes de energía en América Latina", 2017, unpublished.

5. The region lags behind in the provision and quality of infrastructure services, which hinders economic progress and negatively affects the well-being of the population

- Infrastructure development remains insufficient across Latin America and the Caribbean, which limits economic growth and the well-being of the population, and, given its cross-cutting role, directly affects countries ability to implement the 2030 Agenda for Sustainable Development.
- For example, according to the Logistics Performance Index prepared by the World Bank, among the factors assessed that have an impact on logistics performance in the transport sector, infrastructure quality is responsible for the widest performance gap, a gap that has continued to grow in recent years.

■ Figure V.4 ■

Latin America and the Caribbean and Germany: perception of logistics quality according to the Logistics Performance Index, 2016
(On a scale from 1 (low) to 5 (high))

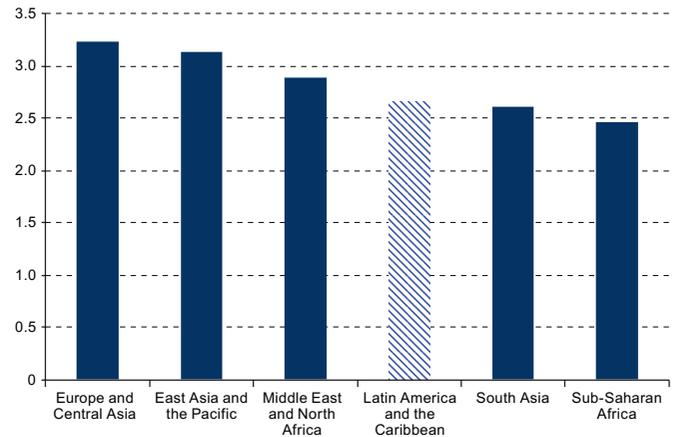


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, Logistics Performance Index, 2016.

Note: The Logistics Performance Index reflects the perceptions of a country's logistics based on six areas: the efficiency of customs and border management clearance (customs); the quality of trade and transport infrastructure (infrastructure); the ease of arranging competitively priced shipments (international shipments); the competence and quality of logistics services (logistic quality and competence); the ability to track and trace consignments (tracking and tracing); and the frequency with which shipments reach consignees within scheduled or expected delivery times (timeliness). The index is based on a scale from 1 to 5, where 5 is the best performance. The data are from surveys conducted by the World Bank, in association with academic and international institutions, private companies and persons involved in international logistics.

■ Figure V.5 ■

Logistics Performance Index, by region, 2016
(On a scale from 1 (low) to 5 (high))



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of J. F. Arvis and others, *Connecting to Compete 2016: Trade Logistics in the Global Economy—The Logistics Performance Index and its Indicators*, Washington, D.C., World Bank, 2016.

Note: The Logistics Performance Index of the World Bank reflects the perceptions of a country's logistics. The index is based on a scale from 1 to 5, where 5 is the best performance. Data are from surveys conducted by the World Bank, in association with academic and international institutions, private companies and persons involved in international logistics.

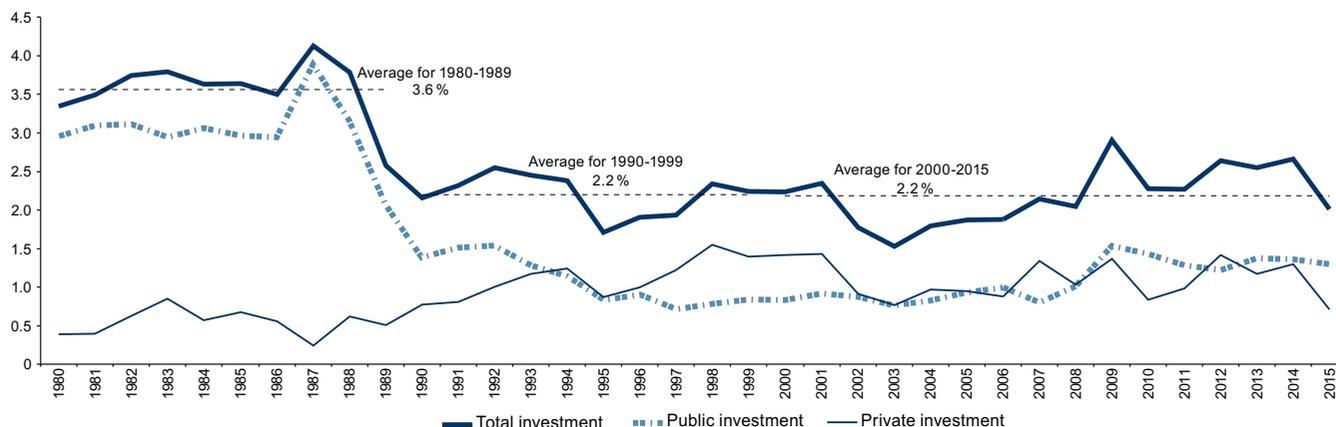
6. Historically, the region has followed a pattern of limited investment in infrastructure compared with other countries and regions

- Weak public and private infrastructure investment is one of the reasons why the provision and quality of these services are severely limited in Latin America. In the region, investment flows into the sector were highest in the 1980s, when combined public and private investment amounted, on average, to 3.6% of GDP for the period 1980-1989 and peaked at 4.1% of GDP in 1987.
- While Latin American countries invest a similar or even larger percentage of GDP compared with other regions of the world, their per capita investment is lower, including than that of China, where infrastructure not only expanded but also improved in quality between 2007 and 2016.

■ Figure V.6 ■

Latin America: infrastructure investment, total, public and private, 1980-2015

(Percentages of GDP)



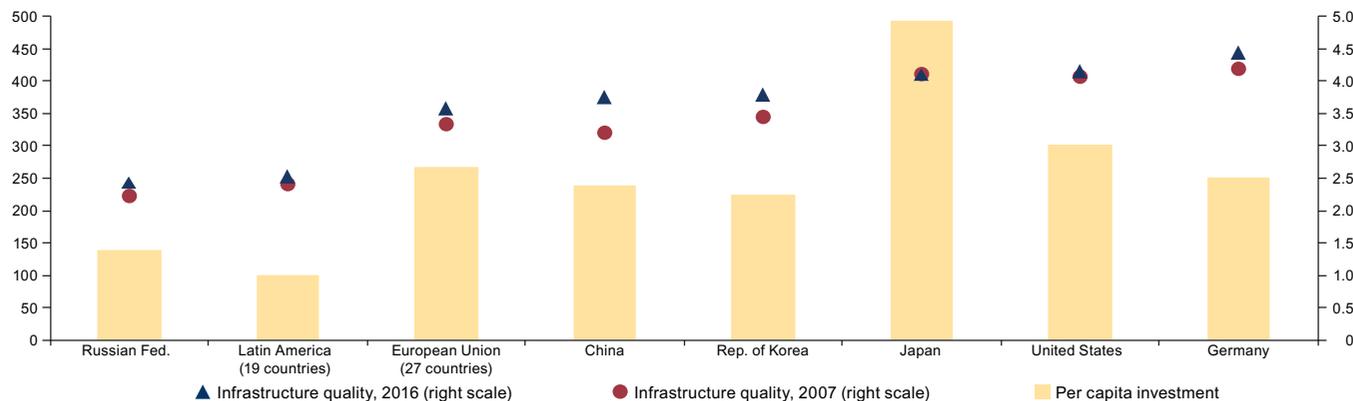
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official information for 1980-2006; C. Calderón and L. Servén (2010), "Infrastructure in Latin America", *World Bank Policy Research Working Paper*, No. 5317, Washington, D.C., World Bank, 2010; figures for 2007-2013 provided by the initiative for measuring economic infrastructure investment of the Inter-American Development Bank (IDB), Development Bank of Latin America-CAF and ECLAC.

Note: For more details see R. Sánchez and others, "Inversiones en infraestructura en América Latina: tendencias, brechas y oportunidades", *Recursos Naturales e Infraestructura series*, No. 187 (LC/TS.2017/132), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2017.

■ Figure V.7 ■

Selected regions and countries: average per capita investment in transport infrastructure (highways and railways), 2008-2015, and perception of transport and trade infrastructure quality according to the Logistics Performance Index, 2007 and 2016

(Dollars per capita and on a scale from 1 (low) to 5 (high))



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Organization of Economic Cooperation and Development (OECD), World Bank, World Development Indicators and Logistics Performance Index.

Note: The World Bank's Logistics Performance Index reflects the perceptions of a country's logistics. The index is based on a scale from 1 to 5, where 5 is the best performance. The Index's "quality of trade and transport infrastructure" criterion was used to measure infrastructure quality. Data are from surveys conducted by the World Bank, in association with academic and international institutions, private companies and persons involved in international logistics.

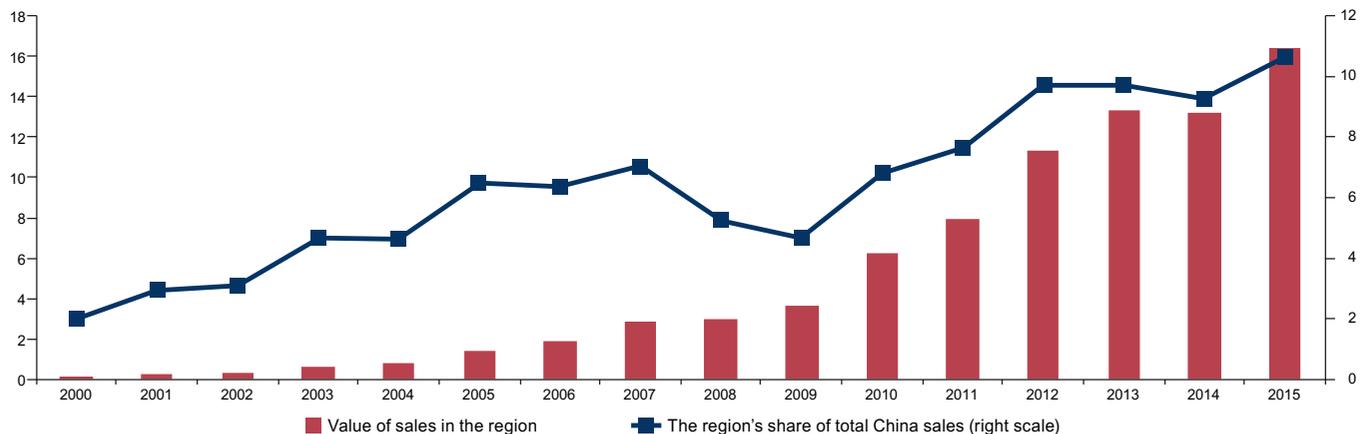
7. China has a clear preference for turnkey projects, as well as remarkable adaptability and experience of undertaking such projects in different international contexts

- With its history of high investment in infrastructure and carrying out large-scale transport and energy projects, China is an important potential partner for the region, owing to the competencies and experience developed in executing and managing projects in China itself and to the financing opportunities for infrastructure projects.
- To date, the involvement of Chinese companies in infrastructure development in Latin America and the Caribbean has been concentrated mainly in turnkey projects,¹ both in terms of business volume and of the region's share of total global sales by Chinese firms generated by this type of contract.
- China's total turnover in the region stemming from these projects rose from US\$ 168 million in 2000 (2% of China's total sales) to US\$ 16.4 billion in 2015 (10.6% of China's total sales). This means that Latin America and the Caribbean is the third most important destination region, behind Asia (44.8%) and Africa (35.6%). The countries of the region which have signed the largest turnkey contracts with Chinese companies in terms of value are the Bolivarian Republic of Venezuela (38.3%), Brazil (15.4%), Ecuador (12.9%), Mexico (6.6%) and Argentina (5.3%).

■ Figure V.8 ■

Latin America and the Caribbean: value of executed construction contracts with Chinese companies and share of China's total sales, 2000-2015

(Billions of dollars and percentages)



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

Note: The concept of annual value of executed contracts refers to construction work completed during the reference period, expressed in monetary value terms, including construction completed on projects signed (and initiated) prior to that period. It includes the countries of the region where contracts have been registered: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Dominica, the Dominican Republic, Costa Rica, Cuba, Ecuador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, the Plurinational State of Bolivia) Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks and Caicos Islands, and Uruguay.

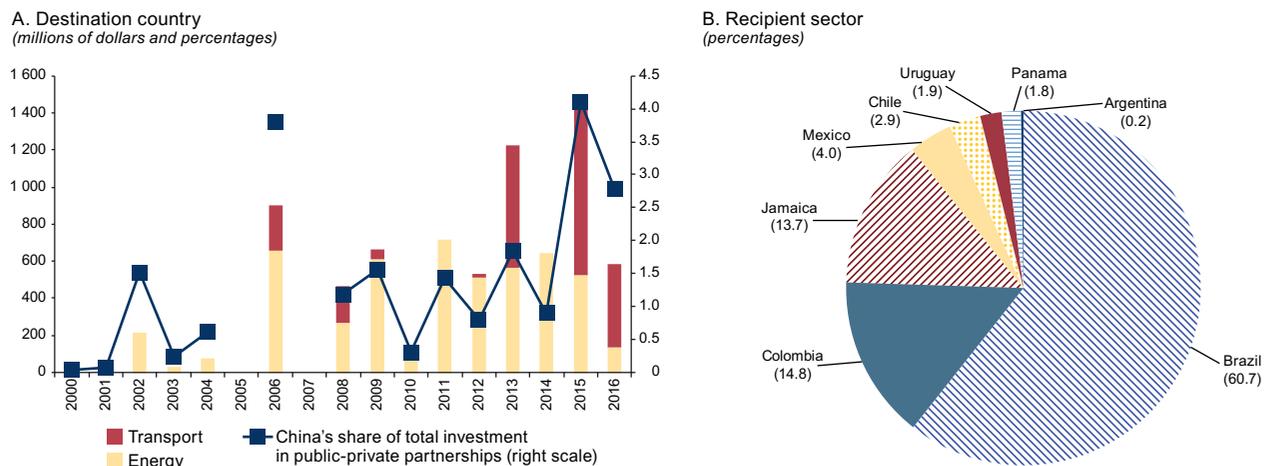
¹ The term "turnkey project" refers to conventional contracts to deliver public or private works, such as construction or design and construction projects, which can also be categorized and classified as engineering, provision or construction projects, under which the construction period and price are generally agreed upon beforehand and the contractor assumes responsibility once construction is complete.

8. China has had limited involvement in public-private partnerships to provide infrastructure in the region, focused on a few countries and on the energy and transport sectors

- To date, Chinese companies have shown little appetite for public-private investment projects in Latin America and the Caribbean, which require greater commitment and present long-term risks. The US\$ 7.663 billion that China invested in the energy and transport sectors through these partnerships in 2000-2016 represented just 1.3% of the total amount invested in the region by all countries in the same period (US\$ 592 billion).
- Chinese-sponsored investment in public-private partnerships has focused mainly on Brazil (60.7% of the total), where almost all of these funds (99%) were injected into the energy sector. The remaining investment flowed to Colombia (14.8%), Jamaica (13.7%) and Mexico (4.0%), where, unlike Brazil, the transport sector was the main recipient. Chinese sponsors did not invest in the water and sanitation or telecommunications sectors.

■ Figure V.9 ■

Latin America and the Caribbean: Chinese companies' sponsorship of public-private partnerships, by sector and destination country, 2000-2016



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of figures by World Bank, Private Participation in Infrastructure Projects Database [online] <http://ppi.worldbank.org/>.

Note: All types of private infrastructure projects available in the database are considered, with the exception of management and lease contracts, cancelled projects and distressed projects. The calculation for investment includes the value of physical assets, adjusted for the percentage of private investment in the project. The countries included are: Antigua and Barbuda, Argentina, Belize, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, the Dominican Republic, Ecuador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, the Plurinational State of Bolivia, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Uruguay. Data for Chile and Uruguay only cover the period up to 2015.

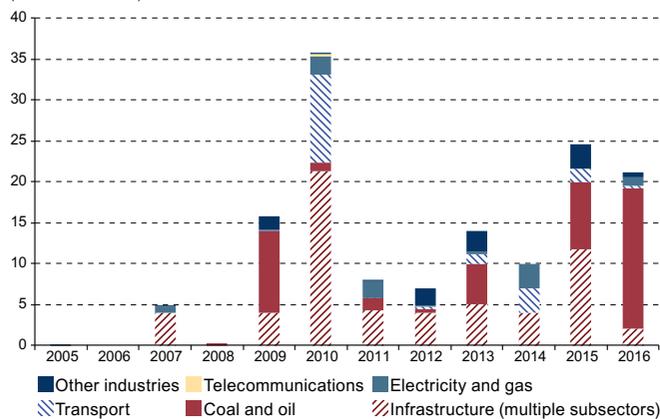
9. Financing from public and private Chinese banks has facilitated the development of construction projects and presents a tremendous opportunity which should be seized to bridge the infrastructure gap in the region

- Funds from Chinese public banks, the China Development Bank and the Export-Import Bank of China, as well as Chinese commercial banks have enabled varied and numerous projects in different industries in the region to be financed, including infrastructure projects. With regard to Chinese public banks, the amount of financing provided to Latin America and the Caribbean since 2010 has exceeded the individual loans from the Inter-American Development Bank (IDB), the World Bank and the Development Bank of Latin America (CAF). Financing was initially limited but later increased and grew steadier. The total amount provided was US\$ 30 million in 2005 and peaked at US\$ 35.7 billion in 2010. The figure declined in 2011 but subsequently recovered to reach an average of US\$ 14.1 billion per year between 2011 and 2016.
- Most of these loans and credit lines (93%) were received by the infrastructure sector, which includes oil and coal extraction (31.0%), transport (12.2%), electricity and gas (6.8%) and other economic infrastructure items (undifferentiated line items across multiple sectors, 42.8%).
- Funding has been concentrated in the countries of the region that have had the greatest difficulty accessing external credit or that are rich in natural resources, for example the Bolivarian Republic of Venezuela (44.0%), Brazil (26.0%), Ecuador (12.3%) and Argentina (10.8%). Around 15% of the amount provided by China to Latin America took the form of loans underwritten by commodities such as oil, which offsets the default risk for lenders, or include variations such as commodity-export agreements with lending countries. There is also a certain correlation between the countries receiving this bank financing and those that are the sites of turnkey projects.
- Lastly, three regional investment funds were established between 2014 and 2015, which are beginning operations: the US\$ 20 billion China-LAC Industrial Cooperation Investment Fund and the US\$ 10 billion Special Loan Program for China-LAC Infrastructure Project, both administered by the China Development Bank; and China-LAC Cooperation Fund of between US\$ 10 billion and US\$ 15 billion administered by the Export-Import Bank of China.

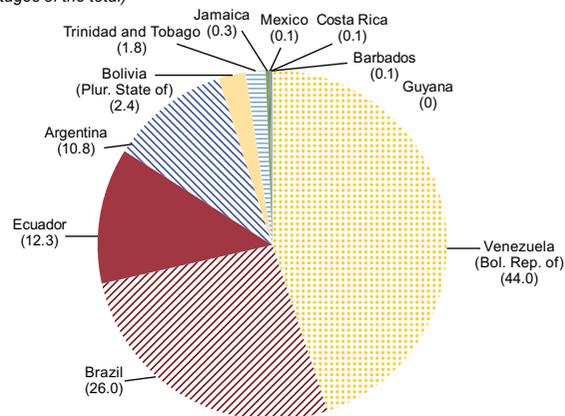
■ Figure V.10 ■

Latin America and the Caribbean: funding provided by Chinese public banks, 2005-2016

A. Amount by recipient subsector (billions of dollars)



B. Total share by destination country (percentages of the total)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of China-Latin America Finance Database [online] www.thedialogue.org/map_list/ and sector news.

B. Latin America and the Caribbean and China: common challenges relating to climate change

1. The effects of climate change are increasingly worrying and Latin America and the Caribbean and China are particularly vulnerable owing to their geographical, economic and social conditions

- Greenhouse gas emissions from human activities have increased steadily since the pre-industrial era. As a result, the concentration of CO₂ in the atmosphere has risen from 280 parts per million to 407 parts per million, the highest level seen in at least the last 800,000 years. This increase is the main driver behind the rise in the global temperature.
- The warmest year temperature² on record since modern recordkeeping began in 1880 was 2016. The temperature

in 2016 was approximately 1°C higher than the average for the period 1951-1980. Meanwhile, 16 of the 17 warmest years on record have occurred since 2001.

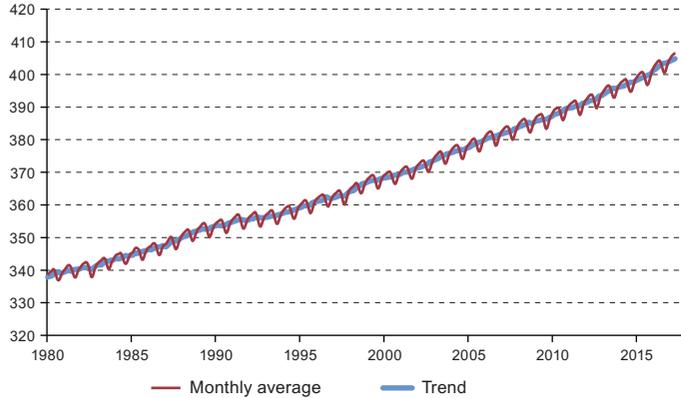
- Sea levels have also been rising. Satellite measurements carried out since 1993 show an increase of 86 mm, at a rate of 3.4 mm per year. Meanwhile, the Arctic ice sheet has been retreating, which will eventually raise sea levels further.

² The average global temperature is based on land and ocean data.

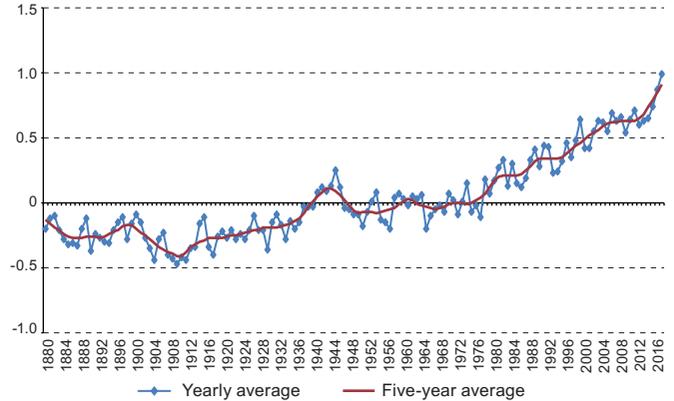
■ Figure V.11 ■

Origin and effects of climate change

A. Concentration of CO₂ in the global atmosphere, monthly average, 1980-2017 (parts per million)



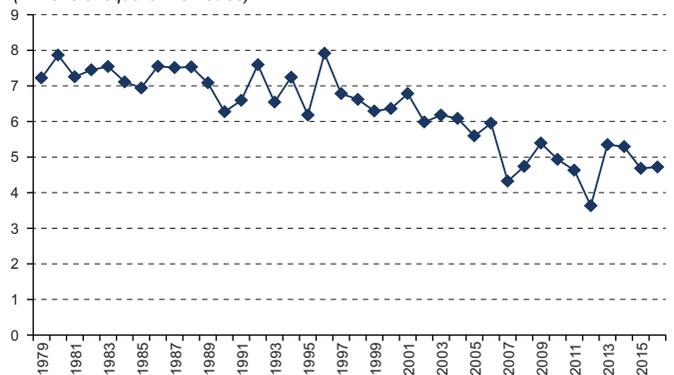
B. Global land-ocean temperature index, 1880-2016 (change in °C relative to 1951-1980 average temperatures)



C. Change in average sea level, 1993-2017 (millimetres)



D. Arctic sea ice extent as of September, 1979-2016 (millions of square kilometres)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of National Oceanic and Atmospheric Administration (NOAA), Earth System Research Laboratory [online] www.esrl.noaa.gov/gmd/ccgg/trends/, the Goddard Institute for Space Studies and National Snow and Ice Data Center (NSIDC) of the United States.

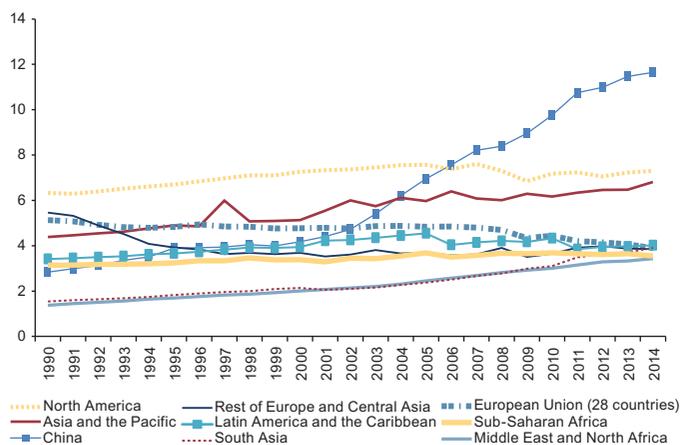
2. Greenhouse gas emissions, which cause global warming, continue to rise

- Global greenhouse gas emissions continue to rise, making it difficult to achieve the goal of holding the increase in the global average temperature to well below 2°C above pre-industrial levels. In 2014, global greenhouse gas emissions reached 48.8 gigatons of CO₂-equivalent (GtCO₂-eq).
- Latin America emits around 4 GtCO₂-eq per year, while China emits 11.6 GtCO₂-eq. Emissions from Latin America and the Caribbean have increased by just 0.7% per year since 1990, thanks to efforts to halt deforestation. Meanwhile, China's emissions have increased at a rate of 6% per year.
- Economic growth is responsible for a considerable proportion of the increase in emissions. Emerging regions are expected to continue to grow at a faster rate than developed economies, so their share of emissions would continue to increase.
- Given the speed of emissions growth, the share of Latin America and the Caribbean in total global emissions has decreased since 1990, while that of China has increased. In 1990, China generated 8% of global emissions and Latin America and the Caribbean 10%. Today, Latin America and the Caribbean are responsible for roughly 8%, while China's share has jumped to 24%.

■ **Figure V.12** ■

Greenhouse gas emissions, by region, 1990-2014

(Gigatons of CO₂-equivalent)

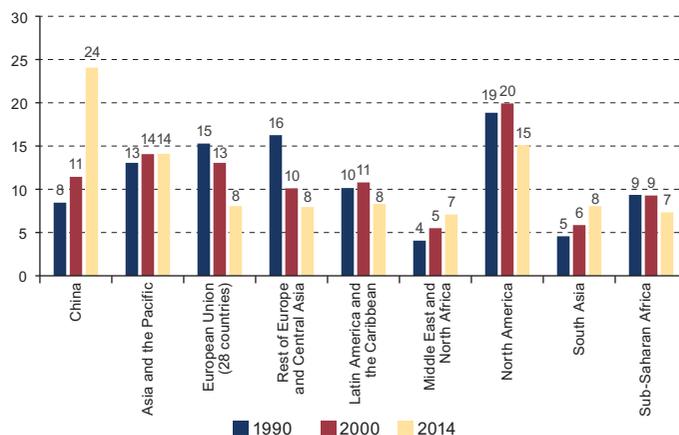


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Resources Institute (WRI), "CAIT 2.0. WRI's Climate Data Explorer", Washington, D.C., 2017 [online] <http://cait2.wri.org>.

■ **Figure V.13** ■

Regional shares of global greenhouse gas emissions, 1990, 2000 and 2014

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Resources Institute (WRI), "CAIT 2.0. WRI's Climate Data Explorer", Washington, D.C., 2017 [online] <http://cait2.wri.org>.

3. The energy sector is responsible for most of the emissions in China and Latin America and the Caribbean

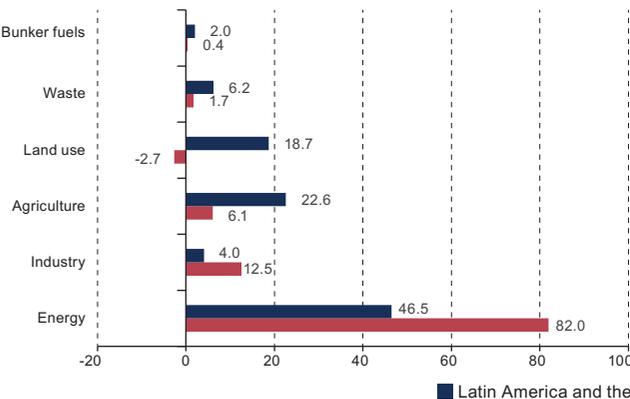
- The energy sector is the main source of greenhouse gas emissions worldwide. Emissions from the energy sector—electricity and heating, manufacturing and construction, transport and other categories— currently account for almost three quarters of total global emissions.
- In the European Union, the energy sector accounts for 86% of the total, making it one of the target sectors for mitigation policies. In particular, electricity and heating account for 40% of the sector’s emissions.
- In Latin America and the Caribbean, energy is currently the most important sector and accounts for 46% of total emissions. The main source is fuel consumption for transport, a sector that is one of the main drivers of emissions in the region.
- Emissions from agricultural activities and land-use change and forestry are still significant in Latin America and the Caribbean, as together they account for 42% of the region’s emissions. However, policies to reduce deforestation have curbed these emissions drastically.

■ Figure V.14 ■

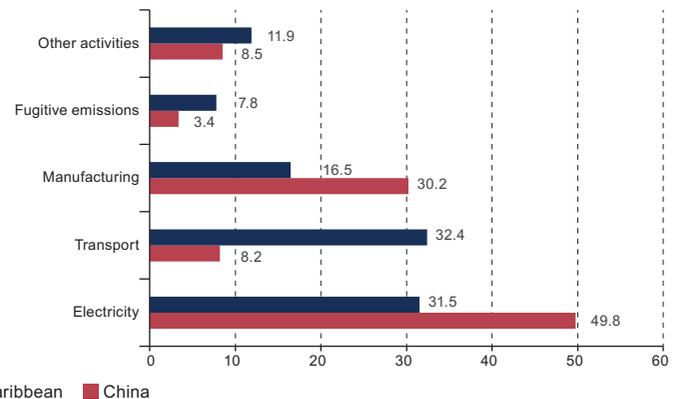
Latin America and the Caribbean and China: greenhouse gas emissions, by sector, 2014

(Percentages)

A. Total emissions, by sector



B. Energy sector emissions, by subsector

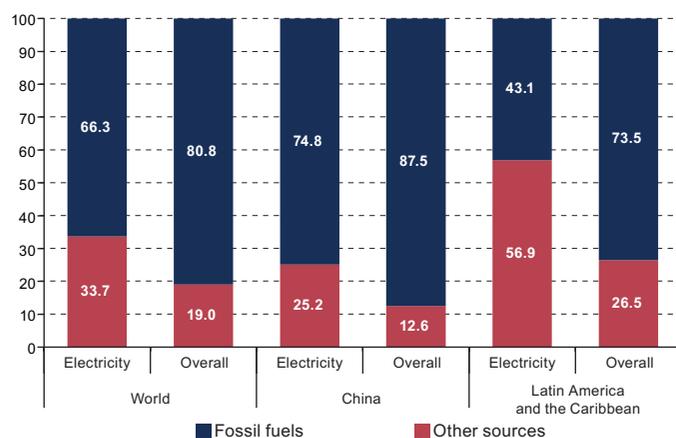


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Resources Institute (WRI), “CAIT 2.0. WRI’s Climate Data Explorer”, Washington, D.C., 2017 [online] <http://cait2.wri.org>.

4. Electricity generation is integral to the transition to low-carbon economies; the share of renewable energy has increased in China and in Latin America and the Caribbean

- The share of fossil fuels —coal, oil and natural gas— in the energy matrix affects, to a large extent, the generation of greenhouse gas emissions. Fossil fuels are currently the main source of energy, accounting for 74% of energy production in Latin America and the Caribbean, and 88% in China. Worldwide, the share of fossil fuels is 81%.
- Latin America and the Caribbean is one of the regions with the lowest use of fossil fuels to generate electricity, mainly because hydroelectric plants are used: 57% of electricity is currently generated from non-fossil fuel sources.

■ **Figure V.15** ■
Share of fossil fuels in the electricity generation matrix and the overall energy matrix, 2014
(Percentages)

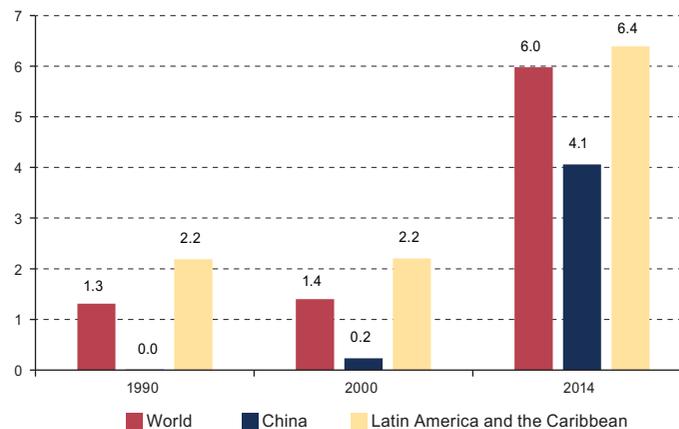


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank, World Development Indicators.

- At the same time, the share of renewable energy has increased significantly in recent decades, particularly, in the last few years. In China, the share of renewable energy (excluding hydropower) was negligible until 2000; by 2014, it had risen to 4% and is likely to continue to grow, given that China is a leading producer of renewable energy

technologies. In Latin America and the Caribbean, the share of renewable energy rose from 2% in 1990 to 6% in 2014. The region could potentially use its wealth of wind, solar and geothermal energy to generate much of its electricity, which is why the share of these renewable energy sources is also expected to increase in the future.

■ **Figure V.16** ■
Share of renewable energy (excluding hydropower) in the electricity generation matrix, 1990, 2000 and 2014
(Percentages)



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

- More than 90% of the energy used for transport comes from fossil fuel sources, both at the global level and in Latin America and the Caribbean and China. Given how the rate of motorization has increased around the world, a massive effort will be needed to switch to new energy sources.
- Currently, North America (Canada and the United States) has the highest motorization rate in the world, with 806 vehicles per 1,000 inhabitants, followed by the European Union, with 577 vehicles per 1,000 inhabitants.

The motorization rate in Latin America and the Caribbean is approximately one third of that of the European Union and one quarter of the rate in North America, while that of China is slightly more than one eighth of the rate in North America.

- However, the motorization rate has increased noticeably in the emerging regions. In the East Asia and Pacific region and South Asia, this rate jumped 120% and 88%, respectively, between 2005 and 2015, while in Latin America

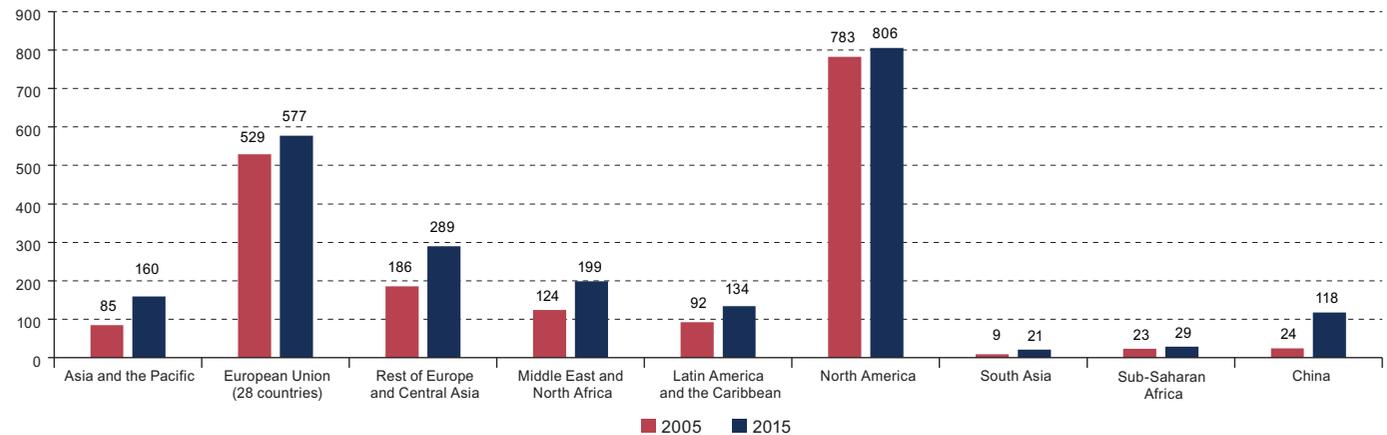
and the Caribbean and in China, it grew by 61% and 387%, respectively, over the same period.

- The rapid increase in the number of vehicles in use around the globe will have a significant impact on greenhouse gas emissions, as 90% of the energy used by the transport sector comes from fossil fuels. This trend also generates other externalities, such as a higher incidence of respiratory diseases related to the emission of pollutants at the local level and the increase in congestion and travel times.

■ Figure V.17 ■

Motorization rate, by region, 2005 and 2015

(Number of vehicles in use per 1,000 inhabitants)



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

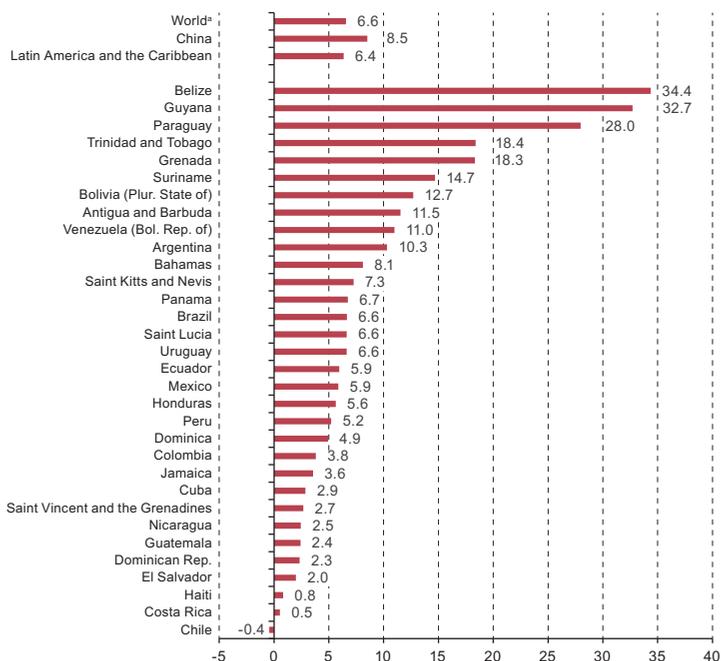
5. Global actions are still not enough to achieve the global goal of reducing greenhouse gas emissions to around 2 tons per capita per year

- It is estimated that to maintain temperatures at non-catastrophic levels, global greenhouse gas emissions must be reduced to a maximum of 2 tons per capita by 2050 and to close to zero, or even removed, by the end of the century.
- The region of Latin America and the Caribbean currently emits 6.4 tons of CO₂-equivalent per inhabitant per year, while China emits 8.5 tons of CO₂-equivalent.
- In Latin America and the Caribbean, only Chile, Costa Rica, El Salvador and Haiti produce 2 tons per capita or less at present.
- To cut emissions by the necessary amount efforts must be made in all sectors of the economy and production and consumption patterns changed. Therefore, policies must be coordinated to facilitate massive investment in environmentally friendly sectors.

■ Figure V.18 ■

China and Latin America and the Caribbean: greenhouse gas emissions per capita, 2014

(Tons of CO₂-equivalent)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Resources Institute (WRI), "CAIT 2.0. WRI's Climate Data Explorer", Washington, D.C., 2017 [online] <http://cait2.wri.org>.

* Countries included in the Climate Analysis Indicators Tool (CAIT).

6. Stopping deforestation is one of the main challenges facing Latin America and the Caribbean. By contrast, China has increased its forest area

- Forests are one of the largest natural resources in Latin America and the Caribbean. With 927 million hectares of forests and rainforests, it is one of the regions with the highest forest cover and accounts for around one quarter of the world total. Forest cover in China was 208 million hectares, 5% of the world total.
- One of the main challenges that Latin American and Caribbean countries face is the conservation and sustainable exploitation of forests and rainforests. Around 97 million hectares were lost in the region between 1990 and 2015, which will have a significant impact on the emissions generated by land-use changes. Agriculture is the leading cause of deforestation around the world. China, by contrast, increased its forest cover by 51 million hectares in the same period.
- It is estimated that between 1990 and 2014, Latin America and the Caribbean was one of the regions with the highest emissions from land-use changes, second only to Sub-Saharan Africa. During this period, the region produced 34.9 gigatons of CO₂-equivalent of greenhouse gases. By contrast, China increased its forest cover, thus removing around 8.4 GtCO₂-eq.
- However, deforestation in Latin America and the Caribbean has slowed in the last two decades, which has reduced emissions. Stopping deforestation is a priority for the region, both to maintain natural wealth and to tackle climate change.
- Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Mexico, Panama and Peru have ratified the New York Declaration on Forests, which was opened for signature at the 2014 Climate Summit. This Declaration includes the goal to halve the rate of loss of natural forests globally by 2020 and to end natural forest loss by 2030.

■ Table V.1 ■

World forest cover and trends, 1990-2015

(Millions of hectares and percentages)

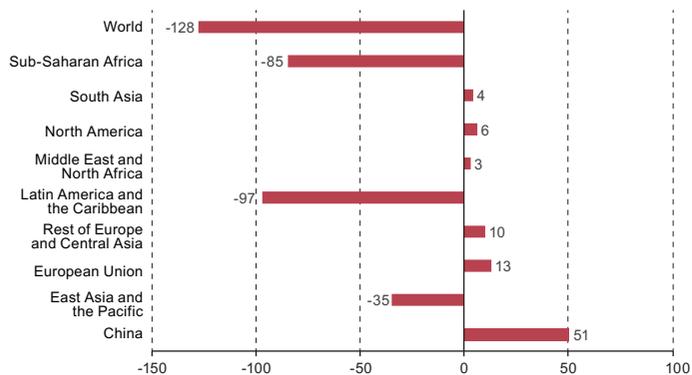
Region	Forest area (millions of hectares)				Change (annual percentage)		
	1990	2000	2010	2015	1990-2000	2000-2010	2010-2015
China	157	177	200	208	1.2	1.3	0.8
East Asia and the Pacific	462	441	430	427	-0.47	-0.24	-0.13
European Union	147	154	159	161	0.45	0.29	0.23
Rest of Europe and Central Asia	872	873	881	882	0.02	0.09	0.01
Latin America and the Caribbean	1 024	979	938	927	-0.44	-0.43	-0.23
Middle East and North Africa	19	20	23	23	0.28	1.21	0.06
North America	650	651	656	657	0.01	0.07	0.03
South Asia	78	79	82	83	0.01	0.46	0.16
Sub-Saharan Africa	698	661	628	614	-0.54	-0.51	-0.46
World	4 112	4 039	4 000	3 984	-0.18	-0.10	-0.08

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

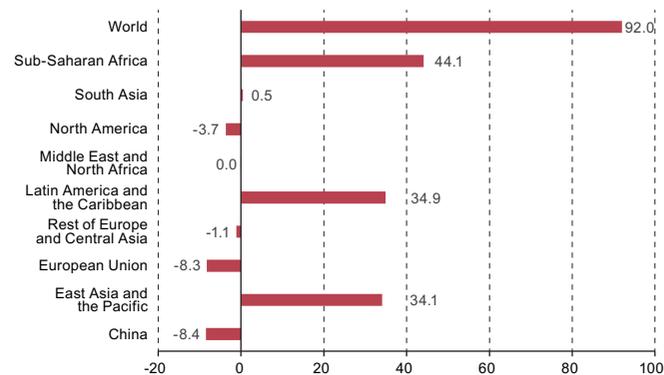
■ **Figure V.19** ■

Cumulative change in global forest cover and total global emissions from land-use changes and forestry

A. Cumulative change in global forest cover, 1990-2015
(millions of hectares)



B. Total global emissions from land-use changes and forestry, 1990-2014
(gigatons of CO₂-equivalent)



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

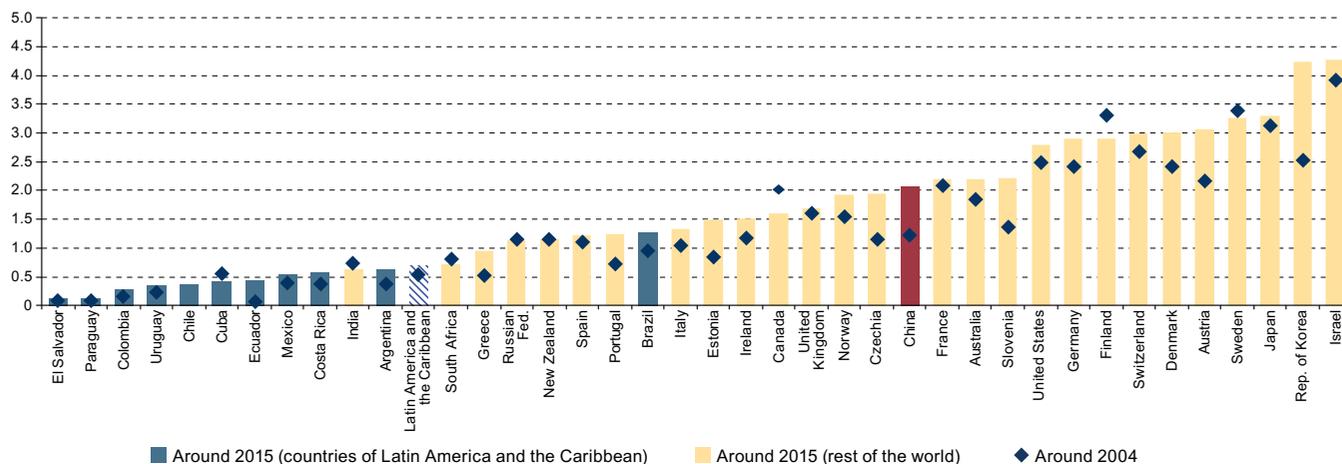
VI. Science, technology and innovation in Latin America and in China

1. Latin America allocates a mere 0.7% of GDP to research and development (R&D) compared to 2.2% allocated by China

■ Figure VI.1 ■

Selected countries: investment in research and development, around 2004 and 2015

(Percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from United Nations Educational, Scientific and Cultural Organization (UNESCO) and Ibero-American Network of Science and Technology Indicators (RICYT).

- With the exception of Brazil, Latin American countries have a low propensity to invest in R&D. Argentina, Costa Rica and Mexico follow, but do not come near the level of innovation of the more advanced countries. At the same time, the data show the wide variations in the region's economies in this regard.
- Worldwide, countries can be divided into five groups based on their R&D investment intensity. The first group, with R&D spending above 2% of GDP, consists of China and some developed countries, with Israel, Japan, the Republic of Korea and Sweden as the leading investors. The second group (R&D between 1% and 2% of GDP) includes economies such as Canada, Czechia, Ireland, Norway, Spain and the United Kingdom. Brazil (1.28%) is the only country in the region that belongs to this group. The third group (R&D between 0.5% and 1%) consists of countries such as Greece, India and South Africa, along with Argentina, Costa Rica and Mexico from Latin America. The fourth group (between 0.2% and 0.5%) comprises Chile, Colombia, Cuba, Ecuador and Uruguay. Lastly, the fifth group (less than 0.2%) includes El Salvador and Paraguay.
- China is becoming a world leader in technological innovation on the back of the promotion of technological development, its share of the aggregate value of global manufacturing activity and the development and use of new production technologies such as digital and automation technologies and advances in robotics. The strategies and policies implemented by the Government include the National Medium- and Long-Term Plan for the Development of Science and Technology (2006–2020), the State Council decision to accelerate the development of strategic emerging industries (2010) and the Made in China 2025 (2015) and Internet Plus (2015) programmes.
- Over the last decade, Latin American countries have been strengthening their innovation policies and establishing new instruments and institutions. While it is true that the

amount of resources allocated to science and technology development remains low compared with China and other developed countries, there is evidence that the specialized institutions are in the learning stages and their creativity is reflected in the constant generation of new varieties of support instruments.

- However, one of the glaring weaknesses in the array of policies implemented in the countries of Latin America is their disregard for the restrictions that the production structure imposes on effectiveness and impact. The privilege of using

horizontal and demand-based policy instruments and the reluctance to establish policies for building capacities in new or emerging sectors have tended to monopolize efforts on activities with limited impact and stifle the potential boost of structural changes to innovation.

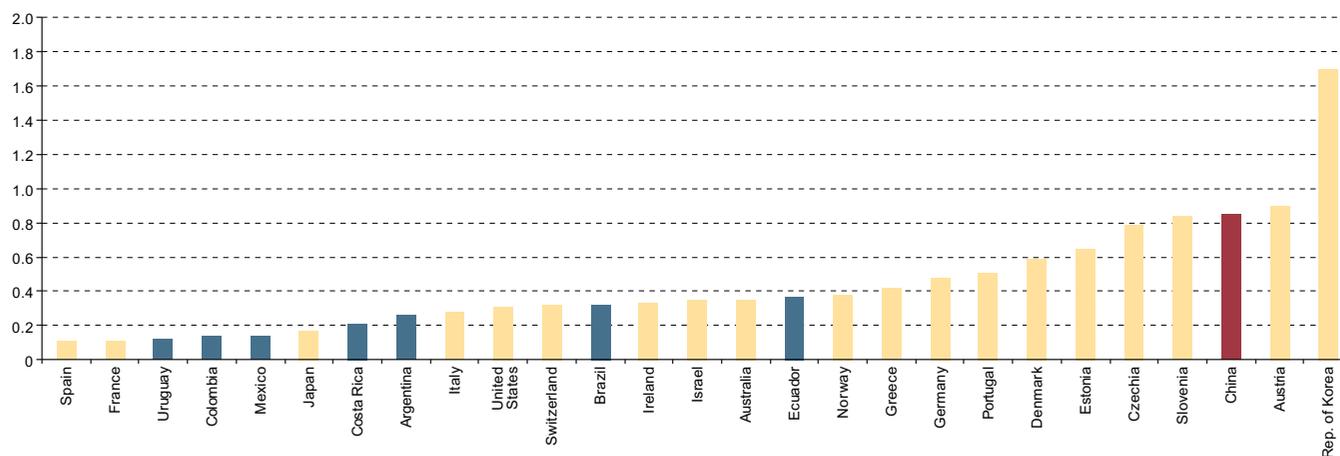
- This is in stark contrast to the policies implemented in countries like China, Finland and the Republic of Korea, which have been able to close the productivity gaps with developed countries relatively quickly.

2. In one decade, China increased the GDP share allocated to R&D by 0.8 percentage points; in the region, only a few countries exceeded the world average in R&D spending

■ Figure VI.2 ■

Selected countries: variation in GDP share allocated to research and development (R&D), 2004-2015

(Percentage points)

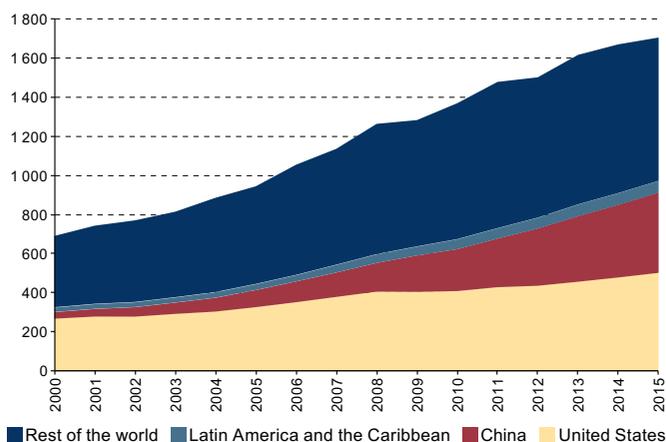


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from United Nations Educational, Scientific and Cultural Organization (UNESCO) and Ibero-American Network of Science and Technology Indicators (RICYT).

- The countries of the region began to give greater priority to science, technology and innovation policies in the 2000's and have since learned much in the field of design and implementation, albeit at a dissimilar pace and with varying success. The most notable achievement in terms of analytics was the incorporation of the concept of the national innovation system, regarded as a complex, non-linear and systemic mechanism that depends not only on the efforts of companies or research centres working in isolation, but also on the interaction of stakeholders (companies or some universities and research centres who respond to market-based or other incentives) with the public institutions that create incentives and regulatory systems.
- However, investment in R&D by Latin American countries is stalling or showing very modest growth relative to China and other emerging economies, which have pushed back their technological frontiers—even relative to technologically mature and advanced countries. In a first group of countries including the Republic of Korea, Austria, China, Slovenia and Czechia in that order, spending on R&D increased by more than 0.7 percentage points of GDP between 2004 and 2015.
- The second group comprises countries that increased R&D spending by between 0.4 and 0.6 percentage points; in descending order, they are Estonia, Denmark, Portugal, Germany and Greece. The third group, which includes several countries from the region (such as Ecuador, Brazil, Argentina and Costa Rica) along with a number of developed countries (for example Israel and the United States) increased their investment by more than 0.2 percentage points, but without exceeding 0.4 points. The fourth group includes some of the countries in which the share of GDP allocated to R&D grew by less than 0.2 percentage points, such as Colombia, Mexico and Uruguay, as well as several mature economies whose growth in this area has slowed over the last few years (for example France and Spain).
- The countries that have invested most in R&D, particularly China, are focusing those efforts on advanced manufacturing, with a renewed policy approach that includes convergence between disciplines, technologies and systems, upgrading emerging technologies and developing innovation capacity in manufacturing. To this end, R&D efforts support the parallel evolution of and convergence between operation technologies, linked to the automation of industrial processes, and new information technology platforms such as the Internet of things, next-generation networks, cloud computing, big data analytics and artificial intelligence.
- In this regard, the Made in China 2025 programme identifies 10 priority sectors: next-generation information technology; high-end numerical control machinery and robotics; aerospace and aviation equipment; maritime engineering equipment and high-tech maritime vessel manufacturing; advanced rail equipment; energy-saving and new-energy vehicles; electrical equipment; agricultural machinery and equipment; new materials; and biomedicine and high-performance medical devices.

3. China ramped up its share in global investment in R&D from 4.7% to 24% as Latin America continues to hover at around 3% of the global total

■ **Figure VI.3 ■**
Global investment in research and development (R&D), 2000-2015
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from United Nations Educational, Scientific and Cultural Organization (UNESCO).

- Global investment in R&D has doubled in the last 15 years, outpacing global economic growth. After stalling briefly in 2008 and 2009, it has regained its pace thanks to the momentum generated in the emerging economies. China has become the second largest investor in global R&D after the United States, spending more than twice as much as Japan and outspending all of the European Union countries combined.
- Although the United States remains the leading investor (accounting for 29% of global R&D expenditure in 2015), its hegemony has started to come under threat from the progress made by China, which increased its share from 4.7% in 2000

to 24% in 2015. China has elaborated a growth strategy based on bolstering its international presence through technological development, readily providing the link between supply and demand for knowledge. This has enabled China to position itself as a leader in advanced manufacturing.

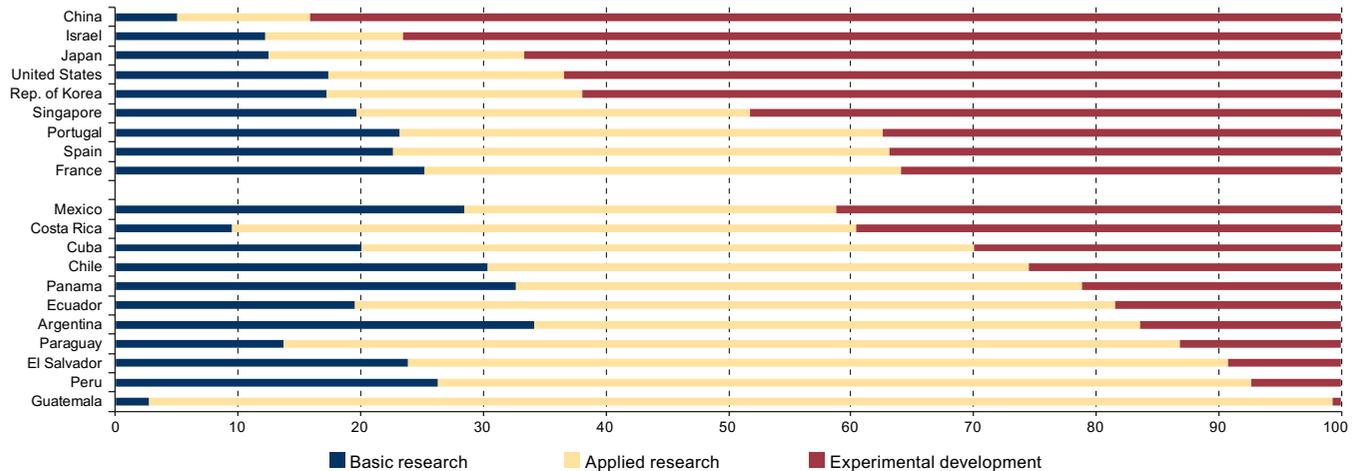
- Latin America failed to capitalize on the boom in commodity prices to develop a strategy focusing on science, technology and innovation as the key driver of growth and development. As a result, the region's progress in terms of R&D was weak compared to that of China and other emerging economies. While the region accounted for 3.2% of global R&D investment in 2000, in 2015 that figure had risen only to 3.5%.
- The slight regionwide increase reflected mainly the growth of R&D investment in Brazil; growth in R&D expenditure in the rest of Latin America was marginal. The design and implementation of science, technology and innovation policies in the region has tended to be slow and accompanied by weak instruments. The reasons for this include continued low spending on science, technology and innovation and little private-sector involvement; the continued subordination of R&D to other economic policies, conditioned by the idea that when the macroeconomic signals are right, production and technology fall into step on the path to growth; institutional weakness; and, lastly, limited coordination between science, technology and innovation policy and a strategy for structural change.
- The result of all of these factors is that these policies remain constrained by a scarcely sophisticated and diversified productive structure, limited endogenous technological capacity and weak demand from the private sector, with no incentives to prioritize knowledge creation and innovation in production activity.

4. In Latin America, R&D is biased towards basic and applied research, whereas experimental development predominates in China

■ Figure VI.4 ■

Selected countries: research and development (R&D) expenditure by type of activity, 2015 or latest available year

(Percentages)



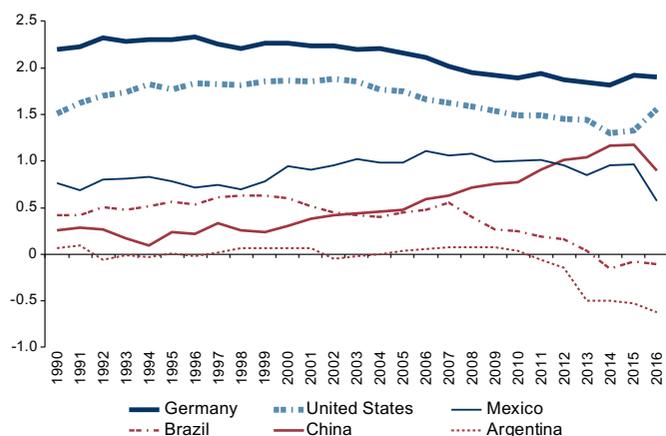
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of information from United Nations Educational, Scientific and Cultural Organization (UNESCO) and Ibero-American Network of Science and Technology Indicators (RICYT).

- There are three categories of activities associated with R&D: basic research, which is systematic original, theoretical or experimental work aimed at increasing the knowledge of a phenomenon or fact; applied research, which seeks to resolve a specific need or practical problem; and experimental development, which is aimed at new or improved production of materials, products, devices, processes or systems.
- China and the technologically advanced countries devote a large proportion of R&D investment to the experimental development of innovative products. In contrast, that type of development in Latin American countries absorbs only a small fraction of R&D spending, which is mostly devoted to basic and applied research.
- The most advanced countries, like Israel, the United States, the Republic of Korea and China, which have based their growth strategies on technological development, allocate between 60% and 80% of their R&D investment to experimental development. In the European countries, this proportion drops to 40%. The countries of Latin America channel a smaller proportion of expenditure into experimental development and devote most of such investment to basic and applied research.
- There are considerable differences within the region: Guatemala and Paraguay display a major bias towards applied research (over 70% of their total R&D investment), while countries such as Cuba and Costa Rica invest 30% in experimental development. Nonetheless, unlike in the most advanced countries, investment in experimental development is not carried out in firms, but primarily in laboratories or research centres.

5. As China increases the complexity of its production structure, Latin American countries are at a standstill or slipping back

■ Figure VI.5 ■

Selected countries: Hidalgo-Hausmann index of economic complexity, 1990-2016



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

- In the period from 1995 to 2014, the complexity of the economic structure of China increased significantly, reflecting its industrial policy strategy of focusing investment efforts on new technology sectors and knowledge-intensive areas, such as the digital economy. This has allowed China to narrow the productivity gap with the most advanced economies and develop new technological capacities in areas such as the Internet of things, cloud computing, big data analytics, robotics and artificial intelligence.

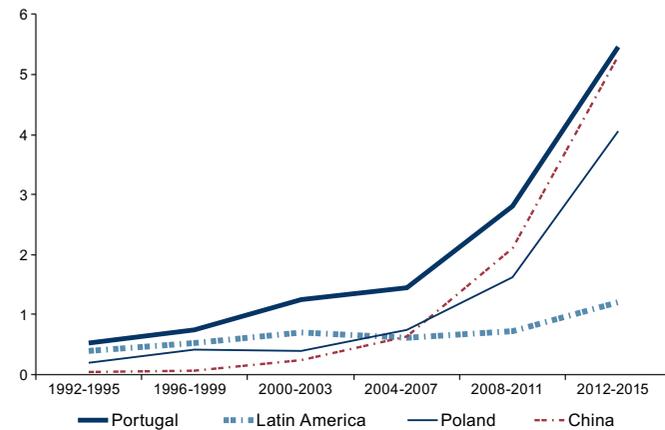
- In contrast, Latin America's lag in terms of production structure and technological capabilities is particularly serious, given its negative impact on productivity and long-term growth potential. During this same period, the complexity of the production structure stagnated in Mexico and declined in Argentina, Brazil and throughout the region. This deindustrialization of Latin American economies is reflected in the low share that manufacturing commands in added value, employment and total exports.
- Argentina and Brazil are experiencing premature deindustrialization, having stepped up their specialization in commodities, natural resource-based manufactures and low-productivity services. Furthermore, not only is the share of manufacturing in total employment lower than expected for countries with their per capita income levels, but this share is continuing to fall; this places Argentina and Brazil in the category of prematurely deindustrialized countries.
- In contrast, the production structure in Mexico is more diversified as a result of the development of the manufacturing industry, mainly on the back of automotive production, but also—to a lesser extent—the electronics and equipment and machinery sectors. The Mexican automotive industry now contributes 18% of the country's manufacturing output, runs a yearly trade surplus of US\$ 52 billion, has a stock of over US\$ 51.2 billion in foreign direct investment (11% of the total) and has created 900,000 direct jobs. Mexico has thus become the world's seventh largest supplier and the fourth largest exporter of vehicles, which accounts for the country having the highest economic complexity index in Latin America.

6. Level of patenting remains low in Latin America but picks up pace in China

■ Figure VI.6 ■

Patents granted by the United States Patent and Trademark Office (USPTO), 1992-2015

(Number of patents per million inhabitants)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from United States Patent and Trademark Office (USPTO) and the World Bank.

- The region's level of patenting remains very low on the international scale, while China has stepped up its patenting significantly. Between 2012 and 2015, China accounted for 4.5% of the total number of patents granted by the United States Patent and Trademark Office (USPTO); Latin America accounted for merely 0.5%.
- Globally, the patenting rate per million inhabitants rose from 13.5 in 1980-1984 to 35.9 in 2010-2014, driven strongly by the advanced economies and a number of emerging ones, such as the Republic of Korea, Singapore and China. Latin America had an average of 0.9 patents per million inhabitants in 2010-2014, well below the levels in developed countries and the world average. Chile, Costa Rica and Uruguay display the best results, in relative terms.
- In the period 1992-1995, the patenting rate per million inhabitants in China was lower than that of Latin America. Since then, China has steadily increased the number of patents per million inhabitants and now has more than four times more patents per inhabitant than its Latin American counterparts.

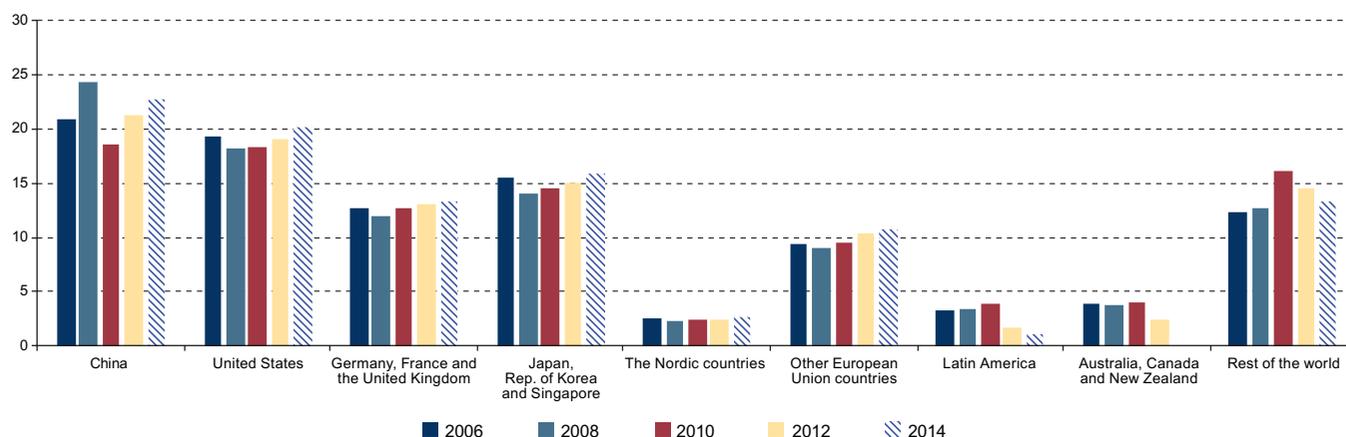
7. China is on par with some countries in the region in the number of researchers as a percentage of the population, but accounts for almost one quarter of researchers worldwide

- In 2014, there were approximately 6.6 million full-time equivalent (FTE) researchers in the world working on R&D, which can be explained by development strategies based on innovation and knowledge and the demand for human resources specialized in science and technology. For that reason, the countries with the largest absolute number of researchers are China and the United States, followed by those of the European Union, Japan and the Republic of Korea.
- The number of researchers in China and India has increased considerably. The former, where the number grew from 1.2 million in 2006 to 1.5 million in 2014, accounts for almost a quarter of researchers worldwide. Most of the advanced country groupings increased the number of researchers in this period, but more slowly than these emerging economies, leading to a drop in their relative weight.

■ Figure VI.7 ■

Global distribution of researchers involved in research and development (R&D), by country group, 2006-2014

(Percentages)



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

- Latin America's overall share in the total remained stable up to 2010, at around 4%, owing to the performance of Brazil, which has constantly increased its number of researchers since the start of the 2000s and now has more than 160,000 researchers (around 60% of the region's total). The second largest contributor is Mexico, followed by Argentina and Chile. Since 2010, Latin America's share has declined.
- Two factors that determine the availability of human resources for research are the capacities of the education system (quality and coverage of the school and higher education systems), and those of research centres and national innovation ecosystems. Projections show that Latin America's contribution to global talent is at a standstill, while that of China is expanding.
- In 2020, China will be the world's leading supplier of persons with tertiary education and its tertiary-educated workforce will account for 20% of the global total, compared with 11% that will come from Latin America.
- In 2012, Latin American countries had an average of 520 full-time equivalent researchers per million inhabitants, but with highly uneven distribution. In that year, China had 900 researchers per million inhabitants, at much the same level as Argentina. This contrasts with the situation in industrialized countries, where the figures were between 2,000 and 8,000 researchers per million inhabitants.
- There are marked differences among the countries of Latin America: for example, Costa Rica has 1,280 researchers per million inhabitants, while Paraguay has 110 researchers per million inhabitants. The increase in the regional average, from 330 to 520 researchers per million inhabitants between 2010 and 2012, is attributable to Argentina and Brazil, which account for nearly half of the region's population and 70% of its researchers.

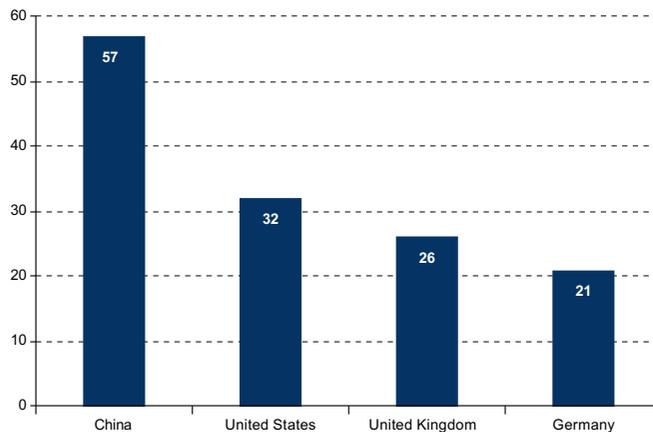
8. China is well placed for the development of Industry 4.0, while Latin America is still in the early stages

- In the advanced manufacturing of the twenty-first century, known as “Industry 4.0”, the digital and physical worlds are converging: advanced hardware is combined with advanced software, the Internet of things, sensors, cloud computing and big data analytics; this results in smart products and processes, with greater interaction between consumers, suppliers and manufacturers through coordination along the entire industry value chain.

■ Figure VI.8 ■

Maturity in implementing the Industry 4.0 strategy, 2015

(Percentages of interviewees who believe their country is prepared for early adoption of the Industry 4.0 strategy)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Infosys [online] www.infosys.com.

- Maturity in implementing the Industry 4.0 strategy varies significantly from one country to another. With 57% of companies surveyed expressing the opinion that the country is ready for the strategy, China is in the lead, followed by the United States, the United Kingdom, Germany and France.
- The most significant change in the economy is occurring in business models based on the Internet of things. The industrial Internet is having disruptive effects in all

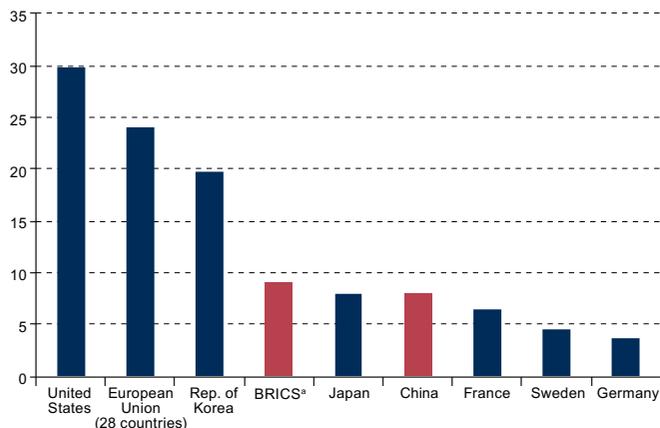
sectors. The boundaries between industries and markets are changing rapidly as smart, connected products emerge and cyber-physical production systems are created.

- This disruptive effect will be most acutely felt in applications for the manufacturing industry, the management of cities, transport and logistics, retail and natural resource-based industries. Although most of the economic value of these applications will be generated in developed countries, there are sectors that offer great potential in developing countries, including the natural resources industry, transport and logistics and manufacturing.
- Some developed countries have bolstered their industrial and technology policies through initiatives such as Industrie 4.0 (in Germany), Advanced Manufacturing (in the United States), and Made in China 2025.
- Although the Industrie 4.0 and Advanced Manufacturing strategies enable significant competitiveness gains for the manufacturing sector, the potential benefit to be obtained will depend on how prepared the countries are for adopting them. Here, China would seem to have an advantage over its closest competitors (Germany, the United States and United Kingdom).
- Latin America is in the early stages of implementing industry 4.0 and there is the risk that the divide will widen in the coming years. There is a window of opportunity to resume the process of *catching up* with the technology frontier. Industry 4.0 can help to address the major challenges of the region, which include diversification of production, high urbanization, population ageing, the need for greater health and education coverage, the environmental crisis and the protection of natural resources.
- There are a number of budding public initiatives in the region, including the plan for machine-to-machine (M2M) services and the Internet of things run by the Ministry of Science, Technology, Innovation, and Communications of Brazil, the Smart Industry strategy implemented by the Chilean Economic Development Agency (CORFO) and the Mexican Government’s Road map for the Internet of things.

9. China is catching up on the leading countries in the development of Industry 4.0 technologies, while Latin America drifts towards the back of the pack

■ Figure VI.9 ■

Leading countries in the Internet of things, by share of related patents granted by the United States Patent and Trademark Office and the European Patent Office, 2010-2012
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from United States Patent and Trademark Office (USPTO) and the European Patent Office (EPO).

* Brazil, Russian Federation, India, China and South Africa.

- As a result of the significant increase in R&D resources, industry 4.0 technological capabilities in China are nearing those of the world's leading countries. In the period 2010-2012, China was among the top four countries with the most patents relating to the Internet of things, with the United States, the Republic of Korea and Japan. This means that the country is reaching the technological frontier associated with industry 4.0.
- The market of industry 4.0 applications in China has grown significantly, primarily in the Internet of things, cloud computing and big data analytics. Between 2011 and 2014,

these markets grew at an annual rate of between 30% and 40%, amounting to \$94 billion (the Internet of things), \$1.1 billion (cloud computing) and \$1.3 billion (big data analytics).

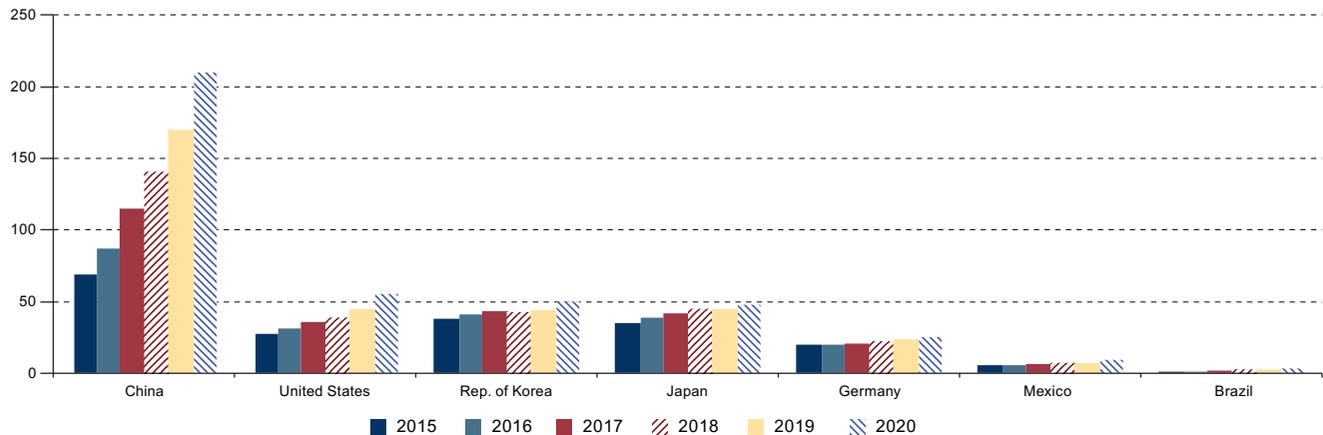
- Manufacturing is the backbone of the Chinese economy. The rapid deindustrialization in advanced economies that began in the 2000s was the result of the massive relocation of industrial production to China, which since 2010, has solidified its position as the world's main manufacturing hub.
- From 2000 to 2014, China increased its share of global manufacturing eightfold —at the expense of the United States, Japan, Italy, France and the United Kingdom— and accounted for close to 25% of the global manufacturing value added. In its industry 4.0 policy, China has strengthened the development of digital technologies, robotics, 3D printers, biotechnology, nanotechnology and new materials.
- In contrast, the technology deficit in Latin America's production structure is reflected in low levels of digitization in various economic sectors. For example, the region's large firms lag behind in terms of digital capacity, primarily in the manufacturing sectors. Capacity is greater in the consumer goods, telecommunications, transport and logistics industries, where digitization levels are similar to more developed countries.
- The major Latin American countries have not attained minimum standards in the five enabling technologies of industry 4.0, which are: broadband, data centres, cloud computing, big data and the Internet of things. Fourth-generation (4G) network coverage is lower than 35%, the average speed of broadband is below 300 kbps, with download speeds of under 50 Mbps, less than 0.1% of GDP is invested in data centres, investment in cloud services accounts for less than 3% of expenditure on information and communication technologies, and there is meagre investment in big data and the Internet of things.

10. China has consolidated its position as the main market for industrial robots, while Mexico and Brazil gain prominence as emerging markets

■ Figure VI.10 ■

Selected countries: estimated annual exports of multi-purpose industrial robots, 2015-2020

(Thousands of units)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data provided by the International Federation of Robotics (IFR).

- China is the largest of the five major robot markets in the world, which together accounted for 74% of total sales in 2016. With approximately 87,000 industrial robots sold in 2016, China came close the total sales volume of Europe and America combined (97,300 units). Chinese manufacturers continued to increase their market share, from 25% in 2013 to 31% in 2016. Between 2011 and 2016, the total supply of industrial robots grew by an annual average of about 31%.
- The rise in robot density in China outstripped the rest of the world in a reflection of that country's industrialization strategy. Between 2013 and 2016, robot density in China jumped from 25 units installed per 10,000 persons employed in the manufacturing industry to 68 units. Density also increased significantly in the United States, from 114 units installed per 10,000 manufacturing industry employees in 2009 to 189 units in 2016.
- The stock of industrial robots worldwide stands at 1.8 million units, with the highest robot density in the Republic of Korea (631 units per 10,000 employees), followed by Singapore (488 units), Germany (309 units) and Japan (303 units).
- It is estimated that between 2017 and 2020, more than 1.7 million new industrial robots will be installed in factories around the world. Consequently, the global stock of operational industrial robots is expected to increase from approximately 1,828,000 units at the end of 2016 to 3,053,000 units by the end of 2020.
- In Latin America, Mexico has the highest robot density, with only 20 units per 10,000 manufacturing workers, followed by Brazil, with 10 units; the world average stands at 74 units per 10,000 workers. Mexico has become an important emerging market for industrial robots, with sales of about 5,900 units in 2016. In contrast, sales were down in Brazil, from 1,407 in 2015 to 1,207 in 2016.

VII. Concluding remarks: new areas of cooperation between Latin America and the Caribbean and China

- This document summarizes the trade and investment relationships between China and Latin America and the Caribbean, and their respective macroeconomic, social, environmental, infrastructure, and science, technology and innovation policies. Common challenges and opportunities

for sharing experiences and knowledge for mutual benefit can be identified in all these areas. Below are some possible opportunities for cooperation between China and Latin America and the Caribbean in the different areas covered in the document.

A. Trade

- As a result of the strong growth seen in 2017, trade between Latin America and the Caribbean and China appears to have recovered the extraordinary dynamism it showed between 2000 and 2013, when its value increased 22-fold. However, the significant shortcomings of the trade relationship with China show no signs of being remedied. On the one hand, the vast majority of the countries of the region consistently run a trade deficit with China. On the other hand, it is a purely inter-industry exchange, in which the region almost exclusively exports natural resources (especially in their raw form) and imports a wide range of manufactured goods. The regional export basket to China is more highly concentrated by product than the export baskets to the region's other main markets and, over the past decade, very few new products have started to be exported to China in significant amounts. Similarly, the substantial trade deficit in manufactures with China remains a cause for concern in the region. In short, trade between both parties, despite its undeniable potential, has contributed little to the process of production and export diversification that the region needs to achieve sustainable development. The One Belt and One Road Initiative could benefit the region by boosting trade between Asia, Europe and Africa and demand for products from Latin America and the Caribbean. While the region is geographically remote from those areas, maritime, air and digital routes can bridge that distance, strengthening trade, investment, tourism and cultural links.
- The characteristics of trade between the region and China are difficult to modify in the short term. Its inter-industry nature is mainly the result of the complementarity between their respective existing endowments of productive factors, particularly in the case of the South American economies that export raw materials. Moreover, geographical distance limits the possibilities for a more intensive exchange in intermediate goods, such as that which exists within the main global "factories". This is compounded by the limited technological capacities of many countries of the region and the linguistic, cultural, legal and regulatory difficulties encountered when accessing the Chinese market, among other factors.
- Notwithstanding the aforementioned difficulties, there are mutually beneficial actions that the governments of the region and of China can undertake to diversify the current trade pattern. A notable example is the food sector, in which China is a net importer and the region a net exporter. In this context, the rapid urbanization and expansion of the middle class in China offer an important opportunity for Latin America and the Caribbean. With its vast natural and water resources, the region has comparative advantages as one of China's leading suppliers of nutritious, safe and high-quality foods. However, this requires a great deal of effort to understand and meet the needs of Chinese consumers, as well as the regulatory requirements for accessing the Chinese market (sanitary and phytosanitary requirements, quality and labelling standards, among other things).
- The first China-CELAC Cooperation Plan 2015-2019 focused on expanding trade, aiming to increase it to US\$ 500 billion by 2025. While this target is welcome, it is clear that an emphasis on quantitative objectives alone will not help the parties overcome the significant shortcomings in their trade relations. At present, actions to shift the structure of trade flows are as important —if not more so— as steps to increase their volume in absolute terms. Therefore, the second China-CELAC Cooperation Plan should incorporate quantifiable targets for the diversification of regional exports to China. The Plan should also commit the parties

to agree as soon as possible a timetable for specific actions to achieve that end. For example, it could be agreed that thematic meetings will be held to raise awareness in the countries of the region of issues such as:

- the regulatory requirements for exporting to China, in various sectors;
- consumer trends;
- opportunities that exist in public procurement processes;
- the options that exist for resolving possible disputes with Chinese buyers, for example, arbitration bodies;
- the requirements and opportunities for distribution through Chinese digital platforms, especially for the region's small and medium-sized enterprises; and

- the opportunities offered by China's inland provinces and smaller cities, which until now have been largely ignored by the region's companies.

- Some Latin American and Caribbean countries have already undertaken activities like these as part of their bilateral work agendas with China. However, this proposal aims to include all the countries of the region, by taking advantage of the institutional framework offered by the Forum of China and the Community of Latin American and Caribbean States (CELAC). Such activities would especially benefit the smaller economies of the region, most of which have weak trade links with China.

B. Investment

- Outward direct investment is an increasingly important element in China's development strategy. Chinese foreign direct investment (FDI) has also taken on growing importance for Latin America and the Caribbean over the last decade. In general, Chinese FDI in the region has been concentrated in projects and acquisitions in natural-resource-intensive sectors (mining, oil and gas). However, over the last five years, Chinese investments have increasingly targeted telecommunications, the automotive industry and non-conventional energy. These three sectors offer attractive opportunities for Chinese companies and, at the same time, can play a crucial role in the development of Latin America and the Caribbean.
- FDI can be a key factor in technology transfer and the adoption of management systems and new business models that improve competitiveness and productivity. It can also contribute to the development of road, port, energy and telecommunications infrastructure, especially given the tight fiscal situation in the region. However, the positive effects of FDI are not automatic. The results in terms of transferring technology, promoting research and development and creating good-quality jobs have, in most cases, fallen short of expectations. It is therefore crucial to review and improve the strategies of Latin American and Caribbean countries for attracting FDI, so that they focus

more on modernizing their economies and diversifying production. In this context, Chinese investments in the region must be channelled into more technologically advanced activities with (global and local) production chains that seek to engage more small and medium-sized enterprises.

- As with trade, the first China-CELAC Cooperation Plan 2015-2019 put the emphasis on expanding bilateral FDI flows, setting the target of a reciprocal FDI stock of at least US\$ 250 billion by 2025. The Economic Commission for Latin America and the Caribbean (ECLAC) has already highlighted the difficulties associated with quantifying the amount of Chinese FDI in the region and, therefore, estimating how much remains to be done to achieve the 2025 target. Nevertheless, intensifying the diversification process that has emerged over the last five years is just as important as increasing the volume of Chinese FDI in the region. The number of countries that receive Chinese FDI, which is currently heavily concentrated in a few South American countries, should also be expanded. In this context, it is proposed that the second China-CELAC Cooperation Plan should include quantifiable targets, like those for trade, with regard to the diversification of Chinese FDI in the region, both by sector and by country of destination. Both parties must also commit to agree on a timetable for specific actions to achieve that end.

C. Infrastructure and energy

- Renewable and clean energy has been given a tremendous boost in recent years in Latin America and the Caribbean, reflected in the increase in installed capacity. However, the pace of investment in the sector has slowed since 2015. In order for the region to take full advantage of the enormous potential of renewable energy, the necessary investments must be made in energy interconnection and storage within and between countries. For example, there are plans to build more medium-sized power plants in South America to meet future demand, a strategy that requires investment in interconnections.
- China has the necessary capacities to undertake infrastructure projects in the region, both with regard to providing engineering services and financing. Public-private partnerships with an interregional approach will be needed to carry out the projects in each of the countries in order to create a favourable regulatory framework and improve governance and the quality of infrastructure policies in the region considerably. Such partnerships must take into account the interests of both parties in order to find solutions that offer mutual benefits, according to a broad definition of sustainability.

D. The environment

- The global commitment to addressing climate change resulted in the speedy ratification of the Paris Agreement, which entered into force on 4 November 2016. At the time of writing, 170 of the 197 signatory countries have ratified the Agreement, including China and 30 countries in the region.¹ The Agreement requires all Parties to make their best efforts to reduce greenhouse gas emissions through “nationally determined contributions” and to strengthen these efforts in the years ahead.
- The challenge of moving towards a low carbon economy is common to both Latin America and the Caribbean and China. In particular, their cities must all address the question of how to control air pollution, caused mainly by the burning of fossil fuels for transport. Cooperation between the two parties, through the exchange of experiences, the strengthening of technical capabilities and the implementation of specific investment projects, could be vital to overcoming these challenges and, more generally, to achieving the Sustainable Development Goals. In this context, there are clear opportunities for cooperation in the areas of electric transport, renewable energy and carbon pricing.

¹ Antigua and Barbuda, Argentina, the Bahamas, Barbados, Belize, the Bolivarian Republic of Venezuela, Brazil, Chile, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, the Plurinational State of Bolivia, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Uruguay.

E. Science, technology and innovation

- With regard to this area, in which China has made tremendous progress, it is proposed that the second China-CELAC Cooperation Plan should include the following:
 - collaborative efforts to strengthen national innovation systems through the design of innovation policies, instruments and institutions, the scaling of emerging technologies and the development of manufacturing innovation abilities;
 - research and development (R&D) initiatives to support the parallel evolution of and convergence between operation technologies, linked to the automation of industrial processes, and new information technology platforms;
 - pilot R&D initiatives in the new Industry 4.0 technologies, such as advanced robotics, the Internet of things, big data analytics, cloud computing and artificial intelligence. These initiatives should focus on sectors and functions of common interest, including for instance digital transformation and e-commerce, sustainable cities, the environment, natural resources and advanced manufacturing;
 - joint research projects between universities and research centres, the exchange of researchers and students, and pilot projects with corporate involvement.

F. Social development

- Latin America and the Caribbean and China face a number of shared social challenges with regard to achieving the Sustainable Development Goals. This opens up plenty of space for cooperation to the mutual benefit of all. Steps could be taken to share socioeconomic analysis of the social realities and policies of the region and China in the areas of poverty; the inequality matrix; social protection systems; income transfer programmes; social and labour inclusion; the rights-based approach in social policies; social institutions; social spending; education; malnutrition and food and nutritional security; information and communications technologies and social policies; disability; children; adolescents and youth; and ethnicity and race, among other issues.
- Access to information could also be facilitated, through databases on non-contributory social protection programmes, social institutions, social investment, youth and social inclusion, children and adolescents.

This document is a contribution by the Economic Commission for Latin America and the Caribbean (ECLAC) for the discussions at the Second Ministerial Meeting of the Forum of China and the Community of Latin American and Caribbean States (CELAC), which will take place in Santiago on 22 January 2018. It was prepared on the basis of the main issues addressed at the First CELAC-China High-level Academic Forum, held at ECLAC headquarters in Santiago on 17 and 18 October 2017. The document summarizes the trade, financial and investment relationships between the region and China, and their respective situations in terms of macroeconomic, environmental, infrastructure, science, technology and innovation, and social development policies. Common challenges and opportunities for sharing experiences and knowledge of mutual benefit can be identified in all these areas. The Second Ministerial Meeting of the China-CELAC Forum presents an excellent opportunity to strengthen all aspects of the relationship between the region and China, contributing to the sustainable and inclusive development of both.

